

Report C-18

ALCOHOL, CASUALTIES AND CRIME

by

Marc Aarens
Tracy Cameron
Judy Roizen
Ron Roizen
Robin Room
Dan Schneberk
Deborah Wingard

Social Research Group
School of Public Health
University of California
1912 Bonita Avenue
Berkeley, California 94704

November 1977

50636-

50641

Alcohol, Casualties and Crime Project

Final Report -- Report No. C-18

✓ ALCOHOL, CASUALTIES AND CRIME

by

Marc Aarens

Tracy Cameron

Judy Roizen

Ron Roizen

Robin Room

Dan Schneberk

Deborah Wingard

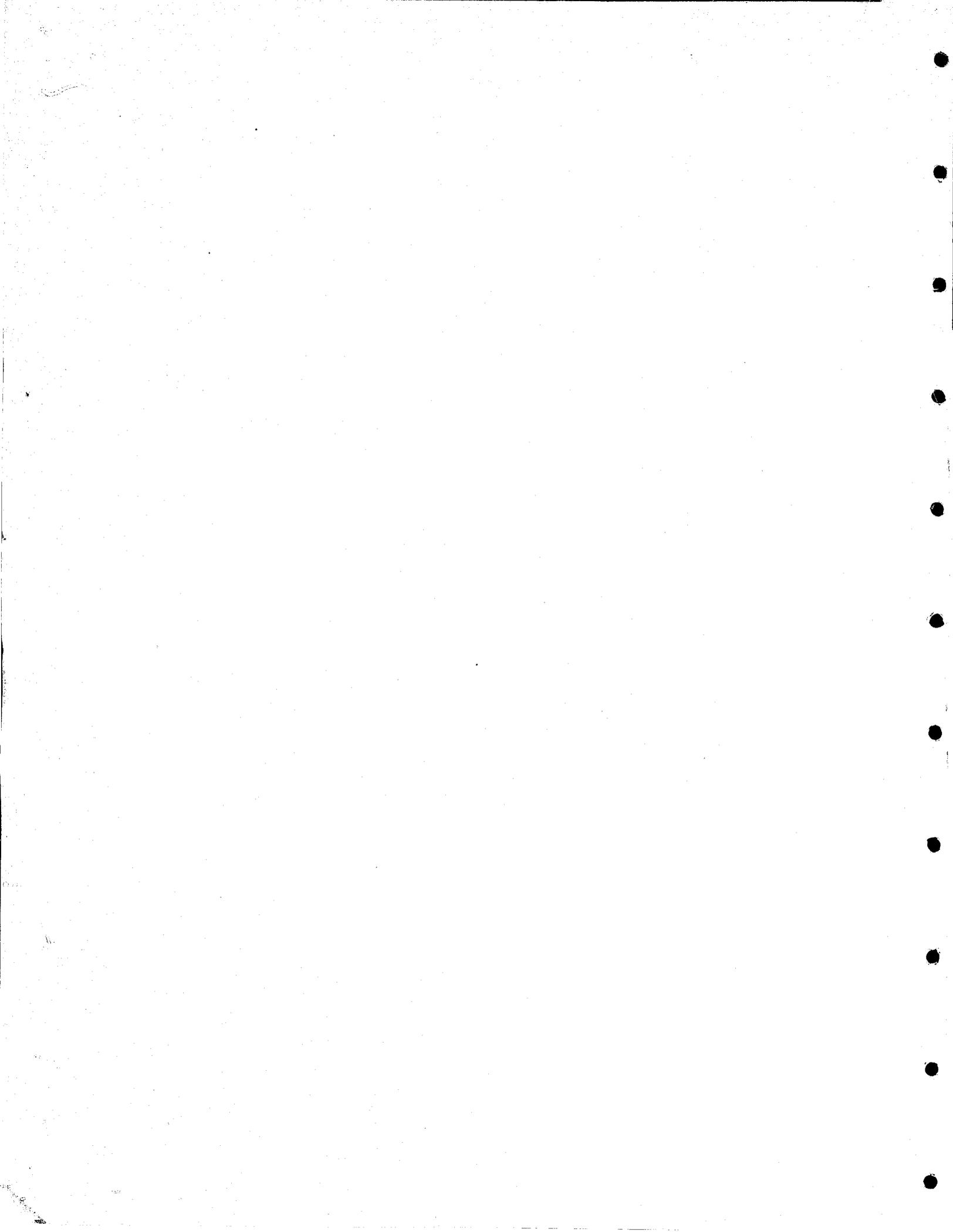
Social Research Group
School of Public Health
University of California
1912 Bonita Avenue
Berkeley, California 94704

November 1977

This report is part of work performed under Task 6 of a contract from the National Institute on Alcohol Abuse and Alcoholism, ADM-281-76-0027, "Selected Studies on the Societal-Epidemiological Aspects of Alcohol Use and Alcohol-Related Problems"

TABLE OF CONTENTS

	<u>Page</u>	
A NOTE ON THE WORK OF THE "CASUALTY STUDY"	i	
STAFF OF THE ALCOHOL, CASUALTIES AND CRIME PROJECT	ix	
GLOSSARY OF COMMON ACRONYMS	x	
CHAPTER ONE: Introduction	1	
CHAPTER TWO: Alcohol and Home, Industrial and Recreational Accidents -- Deborah Wingard and Robin Room	39	
[CHAPTER THREE: Alcohol and Traffic -- Tracy Cameron	120	50637
[CHAPTER FOUR: Alcohol and Crime -- Judy Roizen and Dan Schneberk	289	50638
CHAPTER FIVE: Alcohol and Suicide -- Marc Aarens and Ron Roizen	466	
(CHAPTER SIX: Alcohol and Family Abuse -- Thomas Epstein, Tracy Cameron and Robin Room	525	50639
(CHAPTER SEVEN: Future Research on Alcohol, Casualties and Crime: Building a Tradition	575	50640
1/2 ANNEX A: A Report on the Results of the Research Network Investigation -- Vicki Schneider	605	
(ANNEX B: Guide to a Report: "The Epidemiological Literature on Alcohol, Casualties and Crime: Systematic Quantitative Summaries"	656	50641



A NOTE ON THE WORK OF THE "CASUALTY STUDY"

The objectives of the study were well summarized in the original proposal:

The present proposal aims to accomplish, in a relatively short period of time, a substantial advance in the state of knowledge on the relation of drinking to casualties and social problems. An immediate purpose of the project is to provide new knowledge for the scheduled 1977 edition of Alcohol and Health. Beyond this, the project's purpose is to establish a useful benchmark of knowledge and perspectives, as a basis for policy decisions and for future research.

The proposed study will develop conceptual frameworks for approaching the study of the role of alcohol in social and casualty problems, and within this framework will conduct analyses in a number of specific problem areas. While the existing literature will be reviewed and where appropriate reanalyzed, a major effort in the study will be devoted to identifying and securing analysis of existing data files for specific problems which lend themselves to analysis of the relation to alcohol.

From the first, the study was thus seen as composed of a number of allied activities: review and summarization of the available literature; a "research network" study to find researchers with relevant information and data sets available for reanalysis; carrying out of reanalyses of specific data sets, and of a series of special studies on relevant topics; and synthesis of the material of the study, using a common framework of analysis, into a final report. We knew we were taking on a large task, although we did not realize at first how large the task was. Given the limited timeframe of one year, work of the project began several weeks in advance of the formal start of the contract.

Don Cahalan served as the Principal Investigator of the study. Perhaps the primary role of Ron Roizen and myself in the study was as the "ambassadors from alcohol studies" in fruitful dialectical exchanges with the researchers

who were bringing back the news from the specific casualty literatures. Other members of the existing staff of the Social Research Group played smaller roles in the study, particularly in its initial stages and in the various programming, typing and other "crunches."

The core of the Casualty Study staff was made up of a research group new to alcohol study. Judy Roizen served as the overall coordinator of the project, and held the whole enterprise together by force of her commitment both to the substance and to the staff of the study. Under Judy's overall coordination, the project was divided into a number of informal "departments". The research network study was coordinated by Vicki Schneider, following initial work by Patricia Shanks and Susan Issel. Vicki also served as the administrative officer of the project. Reflecting the divisions found in the literature, the substantive "departments" quite early settled into the divisions found in Chapters Two - Six: Tracy Cameron had prime responsibility for Traffic, Deborah Wingard for Home, Industrial and Recreational Accidents, Marc Aarens for Suicide, Judy Roizen for Crime, and Tom Epstein and Tracy Cameron had responsibility at different times for Family Abuse.

In formal terms, Marilyn Turpin was the coordinator of the "production" end of the study. Informally, she was much more -- editor, arranger, participant in the substantive discussions. John Milkes mediated the formidable demands of the project on the various University libraries, and Lena Johnson did much of the computer work. Stuart Buckley performed in a number of analytical and review roles in the final months of the project.

What was accomplished during the year turned out to be a somewhat refracted version of what was planned. The refraction was due to two factors.

- (1) While we had known the relevant empirical literatures were large and not

well compiled, we were not prepared for how vast and uncumulated they turned out to be. Even in an area like alcohol and road safety, where there were existing literature reviews, coverage and cumulation of studies tended to be fairly hit or miss. We decided that it was important that we try to be comprehensive in our coverage of the existing epidemiological literature, and that we try to summarize its quantitative findings in a systematic fashion. This meant devoting a very substantial part of the resources of the study to the review of the epidemiological literature, at the expense of as full a coverage as we would have liked of other relevant literatures such as experimental studies and the prevention/countermeasures literature, and replacing part of the effort to reanalyze existing data.

(2) Securing data sets for reanalysis turned out to be more difficult and time-consuming than we had expected. Although negotiations began early in the project year, most of the data sets for reanalysis only arrived or were put in usable form in the last weeks of the year. While considerable reanalysis was performed during the year, much of it has thus stretched on beyond the year.

Throughout the project we attempted to maintain a dual concern: with the empirical level of the epidemiological findings, and with the conceptual level of the meaning and social definition of causation -- in particular, of alcohol as a cause of events. Maintaining this concern systematically proved difficult: the bulk and often pedestrian quality of the empirical literature tended to crowd the foreground of the study, and we turned out not to agree among ourselves on the definition and appropriate usage of "cause". But we did maintain throughout the study a keen awareness of the difference between association and cause. It would be a major accomplishment of the study if it

helped banish from the literature the interpretation of findings of association with alcohol in terms of problems "due to" alcohol.* And our reading of the human experimental alcohol literature helped underline the importance of social definition in the effects of drinking as well as their interpretation.

During the year culminating in the present report, the Casualty Study produced six documents besides the present report. Two of these documents are ancillary to the present report:

- (a) Marc Aarens, Tracy Cameron, Judy Roizen, Ron Roizen, Robin Room, Dan Schneberk and Deborah Wingard, Alcohol, Casualties and Crime. Working Paper F56, May 1977.

This report was prepared for use in Alcohol and Health III and is a 200-page boiled down and preliminary version of the present report. Nothing substantial is included in F56 that is not in the present report.

- (b) Marc Aarens, Anne Blau, Stuart Buckley, Tracy Cameron, Arba Goode, Judy Roizen, Gil Schaeffer, Dan Schneberk and Deborah Wingard, The Epidemiological Literature on Alcohol, Casualties and Crime: Systematic Quantitative Summaries. Report C19, August 1977.

A guide to this publication can be found as Annex B of the present report. This 2000-page document summarizes the quantitative findings of 350-odd empirical studies onto a common set of forms.

The other four documents were the results of special studies commissioned on issues relevant to the Casualty Study:

* For a recent prestigious example of this fallacy, as reflected in its title, see Ralph Berry and James Boland, The Economic Cost of Alcohol Abuse, New York, The Free Press, 1977.

- (c) Eero Lahelma, Scandinavian Research on Alcohol's Role in Casualties and Crime: A Review Essay and Informative Abstracts. Report C20, August 1977.

This 200-page publication includes a review essay by Lahelma on the Scandinavian literature, a bibliography of Scandinavian studies published in English and German, and informative quantitative abstracts by Lahelma of 56 studies published in Scandinavian languages. Lahelma's abstracts were checked and put in their final form by Stuart Buckley. This publication was commissioned in order to cover the very substantial Scandinavian work in the area published only in the local languages.

- (d) Thomas Epstein, A Socio-Legal Examination of Intoxication in the Criminal Law. Working Paper F53, March 1977.

Legal proceedings are a major societal arena for the determination of the causation of serious events. We commissioned this and the following paper as discussions of the handling of alcohol by the law as a potential cause of crimes and casualties.

- (e) David Dooley, Alcohol and Legal Negligence. Working Paper F62, June 1977.

It was interesting and thought-provoking to find that alcohol figured quite differently in civil law from in criminal law.

- (f) Harry Levine, Colonial and Nineteenth Century American Thought about Liquor as a Cause of Crime and Accidents. Paper E48, August 1977.

Again, our interest in the social definition of alcohol as a cause of events led to this interesting paper by the Social

Research Group's historical sociologist on shifts in social thought.

It is conventional to preface a report such as this with a list of acknowledgements. In the present case, to compile such a list would itself be a major project. The "Casualty Study," as it was informally known, depended on the cooperation of literally hundreds of researchers and others across the world. As the listing of the staff of the project shows, a large number of people were directly involved in the study, some for brief periods and some for the whole life of the project. Others served as consultants on various parts of the project, including Professors Ira Cisin, Joseph Gusfield, and Richard Seiden. A number of staff members of the National Institute on Alcohol Abuse and Alcoholism contributed to the success of the study. Leland Towle played an important role in the conception of the study. David Promisel and Jacob Brody gave advice and encouragement. Tom Harford served as our Project Officer. Henry Malin and Judith Cokely are currently helping to cope with the aftermath of the project. The two NIAAA staff members with the deepest involvement were Nancy Dorman and Elizabeth Parker. Nancy was a major help in our search of the literature, and continued to channel our way relevant material throughout the project. Elizabeth took on the unenviable task of boiling our 200-page "summary" report for Alcohol and Health III down to a manageable number of pages.

An idea of the major sources of assistance from researchers and other workers in the various casualty fields and in alcohol research can be garnered from a reading of Annex A, the report on our "research network" study. Particular thanks should be given to the researchers who were able and willing to send us data sets or to perform tabulations to be used in the study:

Aaron Beck
Berthold Brenner
Emmett Condon
Lowell Gerson
David G. Gil
Martin Gold
Merwyn R. Greenlick
Marilyn Johnson

Marika Kovacs
Demmie Mayfield
Andrew McGuire
Donald C. Pelz
Clyde Pope
Herbert Ripley
Carolyn Thompson
Pat Williams
Art Wolfe

It is, of course, too soon to talk of the legacy of the year's work.

Some continuities are, however, already clear:

(1) Under the auspices of the Epidemiology Branch of NIAAA, at least some of the data files assembled in the course of the study will be transferred to the National Alcohol Epidemiology Data Archive being formed at the National Clearinghouse for Alcohol Information;

(2) With an extension of time and funding from NIAAA in the wake of the draft final report, a number of specific empirical analyses of alcohol and casualties or crimes now underway will be completed by SRG staff in the next few months;

(3) With the recent transformation of the Social Research Group into a federally-funded national alcohol research center, a program of further analysis and of new data collection relevant to alcohol and serious events will be undertaken in the next few years.

Regardless of these continuities, the year-and-a-bit of the Casualty Study's existence as a freestanding project forms a separate and now closed chapter. For those involved in the study, it was an intense experience. I suspect that none of us will easily forget the project "retreat" where we dissected the first 500-page draft, argued into final form the basic framework for the reviews, and embarked on the 200-page "Alcohol and Health" version.

Or the meteoric career of the study's basketball team (motto: "we're .10") in the intramural leagues, the various project experiments with portable breathalyzers, the 3 a.m. hamburgers as drafts were beaten into shape, the sudden enlightenments as one "event's" literature was compared with another's, the fierce debates over the nature of causation. Throughout, the Casualty Study staff worked incredibly hard and those of us remaining in the alcohol field are in their debt.

Robin Room

November 1977

Staff of the Alcohol, Casualties and Crime Project

Many people performed multiple functions. Listings by function are thus approximate.

Analysts and Writers

Marc Aarens
 Tracy Cameron
 David Dooley
 Thomas Epstein
 Eero Lahelma
 Harry Levine
 Judy Roizen-- coordinator
 Ron Roizen
 Robin Room
 Dan Schneberk
 Deborah Wingard

Typing

Marilyn Turpin-- secretary, editor
 Tom Biddison
 Vicki Hawk
 Ida Park
 Abby Smith
 Heather Taylor
 Barbara White

Temporary Typists

Charlotte Avante
 Margaret Baumgartner
 Maria De Berigno
 Virginia Downing
 Margaret Henderson
 Kay Miles
 Christina Miller
 Barbara Preston
 Joan Siegal

Social Research Group assisting staff

Kirk Beck
 Dick Bunce
 Joyce Gordon
 Angela Harmon
 Andrea Mitchell
 Janie Pasalich
 Carol Seiden
 Pamela Street
 Beatrice Treiman
 Larry Wallack
 Kathryn Young

Reviewers

Anne Blau
 Stuart Buckley
 Cristian Eyzaguirre
 Michael Fisher
 Bob Fitzgerald
 Arba Goode
 Pam Hefferman
 Seth Jacobs
 Ellen Lasser
 John Milkes
 Paul Newacheck
 Gil Schaeffer

Research Network Staff

Vicki Schneider-- coordinator
 Patricia Shanks
 Susan Issel

Programming

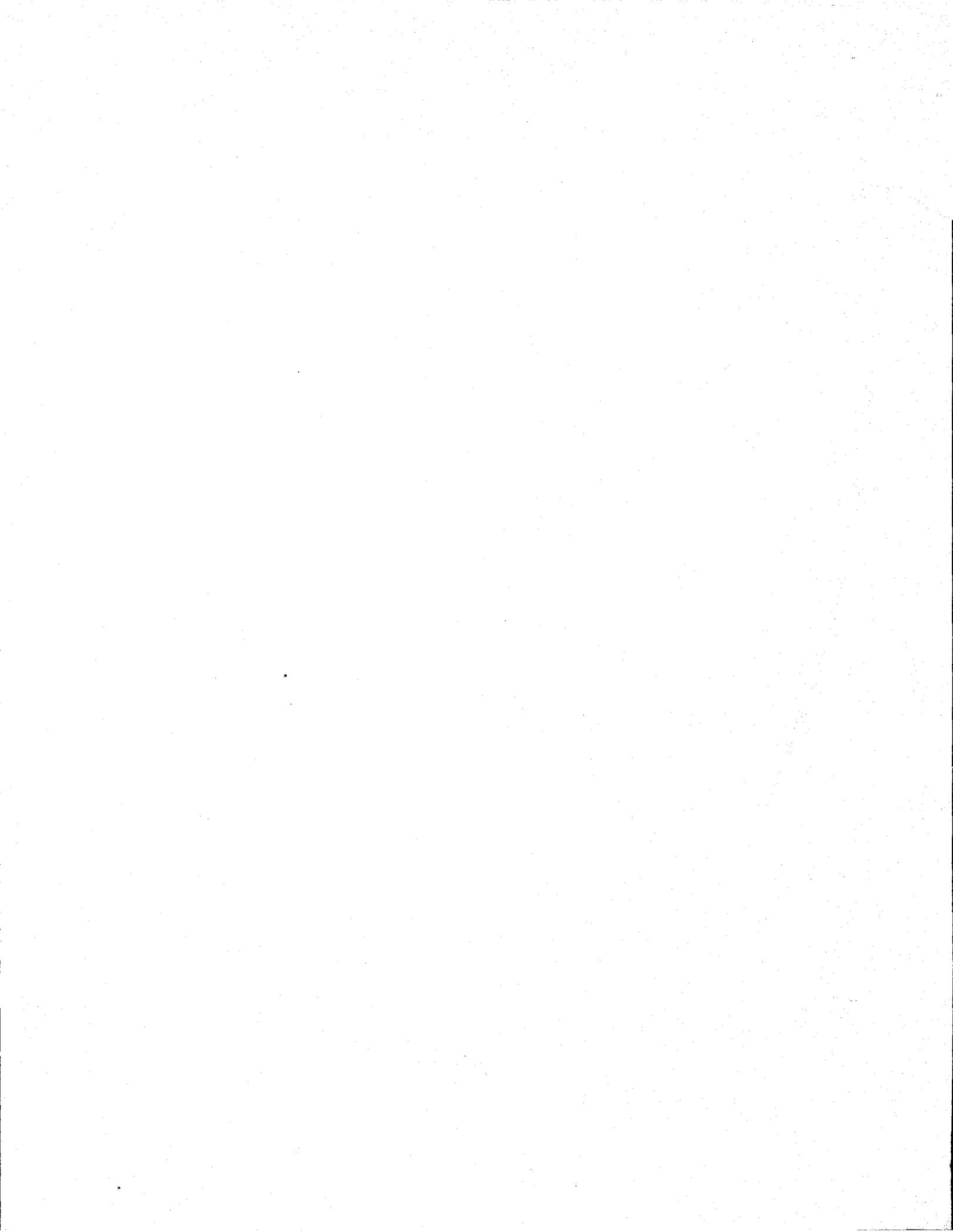
Lena Johnson
 George Myland

Survey Research Center assisting staff

Margaret Baker
 Jane Bernand
 Barbara Ingham
 Jim Harris
 Sheila Leary
 Karen Olsen
 Marsha Penneau
 Craig Plumlee
 Martin Serman
 Harvey Weinstein

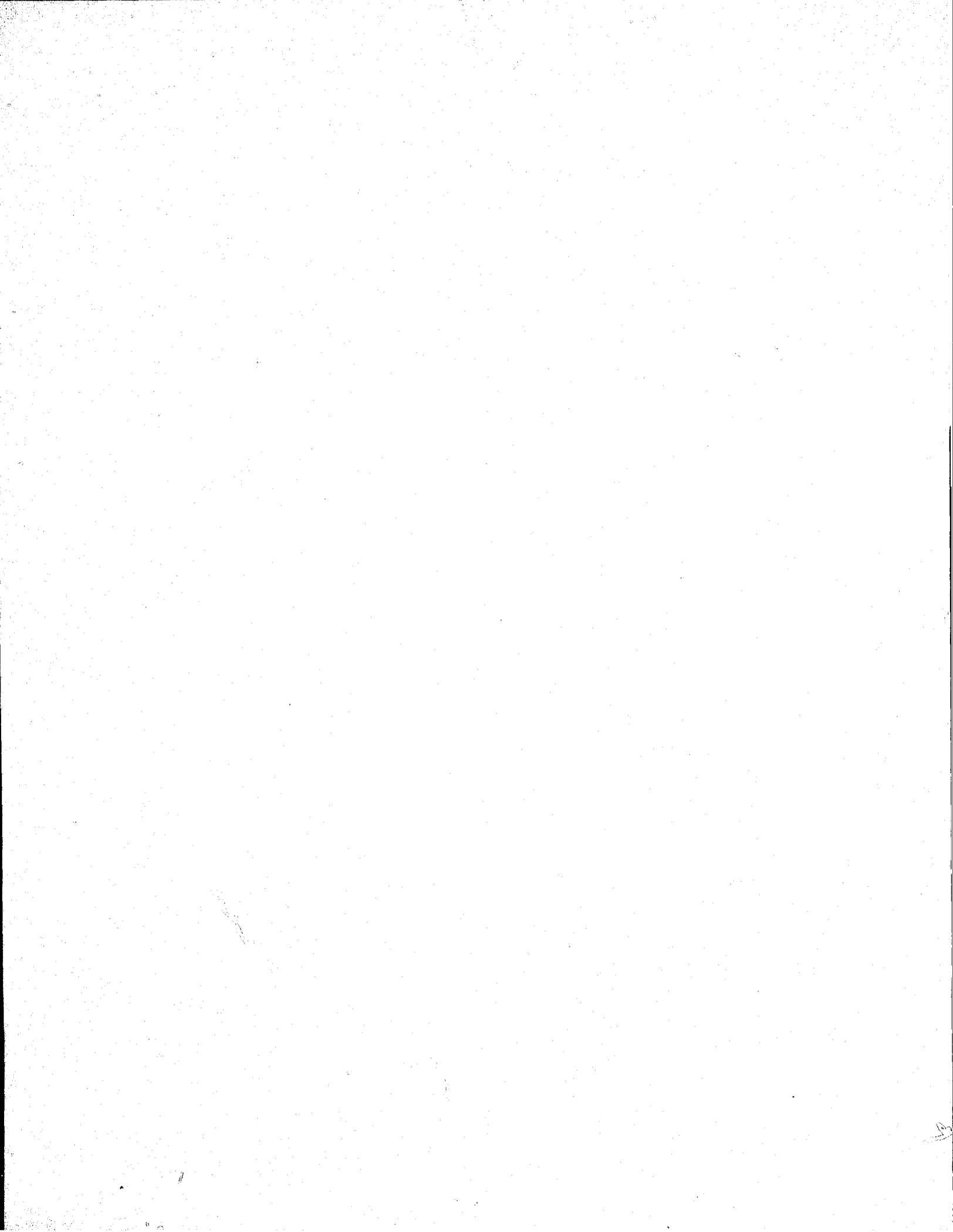
Glossary of Common Acronyms

- AA.Alcoholics Anonymous, a worldwide fellowship of recovered alcoholics.
- ASAP.(any) Alcohol Safety Action Project, funded in individual communities by DOT; or the program consisting of all such projects.
- BACBlood-alcohol content, particularly as used as evidence of DUI/DWI.
- DOTDepartment of Transportation of the U.S. Federal Government.
- DUIDriving Under the Influence (of alcohol), a legal charge.
- DWIDriving While Intoxicated, a legal charge.
- HEWDepartment of Health, Education and Welfare in the U.S. Federal government.
- HSRI.Highway Safety Research Institute, University of Michigan
- JAMA.Journal of the American Medical Association.
- LEAA.Law Enforcement Assistance Agency, U.S. Department of Justice
- NCANational Council on Alcoholism, the nationwide U.S. voluntary organization in the alcoholism field.
- NFPA.National Fire Prevention Agency.
- NHTSANational Highway Traffic Safety Administration, part of DOT.
- NIAAANational Institute on Alcohol Abuse and Alcoholism.
- NIDA.National Institute on Drug Abuse.
- NSCNational Safety Council, a nationwide voluntary organization.
- QJSA/JSA. . .(Quarterly) Journal of Studies on Alcohol.
- USGPOUnited States Government Printing Office.



CHAPTER ONE

INTRODUCTION



In this report, and its component sections we attempt to organize the current state of knowledge and thought about the role of alcohol in serious events -- events involving the occurrence or imminent threat of death, injury, or property loss. These are events that are taken seriously -- most of us care passionately about such events when they occur to us or threaten us. Most of the time, such events are considered to be bad or undesirable, although their intentional occurrence may on occasion be culturally or legally prescribed -- as in capital punishment or a potlatch.

In our everyday assumptions, undesirable serious events tend to be divided into two classes: those which are seen as crimes and those which are seen as accidents. The borderline between these classes is conventionally defined in terms of human intentions; any "accident" which is seen as involving human intentions becomes redefined as a crime: thus a fire becomes arson, a black eye becomes assault, a traffic casualty becomes vehicular homicide. But this differentiation is far from clear. Some casualties do not fit on either side: suicide, which no longer is a crime, is by definition not an accident; and intrafamily violence, even when intentional and resulting in injury, has not necessarily been a crime either legally or in terms of conventional responses to it. Furthermore, the distinction in terms of intention has become increasingly fuzzy in recent decades. In law, nineteenth-century notions of criminal intent as either present or absent have given way, first to a distinction between "specific" and "general" intent, and now sometimes to a whole series of gradations of intent (Epstein, 1977). Conversely, in the public health arena, the argument has been made that an event should not be labeled and regarded as an "accident" where prudent forethought and preparation could have prevented

its occurrence (Perrine, 1975). Despite the uneasiness of modern thought with a simple distinction between intended and unintended events, the distinction is maintained by the practical assignment of events to different social agencies: intentions in a serious event are a primary concern of legal agencies, but not of health agencies. In general, the divisions in the literature reflect the institutional arrangements. Consequently, in the following discussion we will follow the conventional divisions of the literature on alcohol and serious events, examining separately crime, suicide, traffic accidents, other accidents, and family abuse.

In all ages, people have sought to understand and explain the occurrence of serious events. This impulse arises from several motivations: to provide solace or satisfaction to those affected, to determine responsibility and liability for the event, to undo as far as possible its effects, to give clues on the prevention of similar events in the future. The range of the modes of explanation available is also diverse: the event can be viewed in terms of supernatural intervention or natural causes; as inevitable, as justified by offsetting gains, or as preventable; as an isolated occurrence, as part of a chain or pattern of events, or a symptom or indicator of an underlying condition; as due to physical causes, to human error or failure, or to malice. Numerous social institutions are charged with managing or reacting to serious events and each has its characteristic modes of understanding and vocabularies of cause: for instance, emergency rooms and coroners talk of "causes of death" defined in terms of location in the body and/or external instrument of the "trauma"; highway patrolmen talk of the "responsible" driver or of weather or road conditions or mechanical failure as causes of an accident; criminal courts examine guilt or innocence as a mode of establishing cause. Such professional

vocabularies, and their lay counterparts for various kinds of serious events, each look at the question of causation differently, and settle on a different level or dimension as the place where causal explanation is complete and no further search for causes is needed.

Alcohol As An Explanation of Serious Events

Alcohol can figure in our understanding of a serious event in a number of ways. To the eighteenth-century American, alcohol, as the "good creature of God," might indeed be present in a serious event, but this tended not to be regarded as a potential explanation of the event (Levine, 1977), any more than we would be likely today to explain, say, a robbery in terms of the robber's fatigue or an accident in terms of the responsible party's blood caffeine level. Conversely, the nineteenth-century American temperance movement tended to regard the presence of alcohol in a situation as a sufficient explanation for any serious event which occurred, and on occasion writers would portray alcohol also as a necessary condition, e.g., for wifebeating (Levine, 1977). Under the influence of temperance thinking, nineteenth century discussions tended to regard alcohol as an explanation which made further inquiry superfluous, much as heroin use sometimes tends to be regarded in our own era. Anyone and everyone who drank entered into a progression of ill effects, and thus a nation that regarded drinking as part of ordinary social life was on that account operating with a serious social handicap. Phrased like this, in broad and sweeping terms, it was to be expected that many of America's problems and tragedies could be traced to alcohol. Sometimes, the link between alcohol and unfortunate events passed through mediating social institutions that then became the focus of social reform -- the drink shop in pre-prohibition days, and,

during prohibition, the rumrunner and the speakeasy, were major targets for social reform. Thus the word "alcohol" came to take on a wide meaning that could include within its referents the substance ethanol, places where drinking was done, producers and distributors of alcohol, drunkenness, alcoholism, and so on. One or another, or even all of these "aspects" of "the alcohol problem" might be tacitly invoked when a citizen argued, say, that much of the local crime problem was due to "alcohol."

In the half-century after the passage of National Prohibition attention tended to turn away from the role of alcohol in the creation of serious events. The temperance movement advocate became, for many, a cultural caricature of excessive zeal and overly simplistic conceptions of the sources of personal troubles and social problems. The period following Repeal saw the rise of a much narrower conception of "the alcohol problem," a conception that zeroed in on drinkers who regularly and seemingly without good reason exceeded the drinking norms of their relevant social environment. Thus, in post-Repeal United States, in the main it was not alcohol or drinking or bars or even drunkenness per se that formed the essence of "the alcohol problem," but instead the deviant drinker, who came to be known as the alcoholic. An exception to this trend was thought on alcohol and traffic accidents, which retained a focus on alcohol per se in the event.

Americans in the post-Repeal period might be said to have been tired of the alcohol issue. On the public agenda was an economic Depression to be survived and a worldwide war to be won. It was a time when students of alcoholism and alcohol problems had to struggle to find an audience; one early alcohol-problems scholar of the period described it as the doldrums (Bacon, 1969). In spite of the widespread lack of interest in alcohol and the competition from other public issues, this period is largely responsible

for shaping the mold that has dominated alcohol-related-problems thinking since then. If theoretical and policy attentions were to turn to the deviant drinker, then this focus implied that drinking by itself, or drinking safely within the limits of polite behavior, was not a problem and not a source of serious events.

But this massive intellectual shift, which moved the causal emphasis from alcohol per se to the deviant drinker, did not result at first in a stable, fully consistent, or workable social conception of alcohol-related problems. For example, if prudent and responsible drinking behavior was not supposed to be a problem and not supposed to produce problematic events, then the occurrence of a serious event in which drinking was partly at fault would become, by definition, an argument for the occurrence of alcoholism. In short, any problem that became viewed as a byproduct of drinking could become interpreted as a sign of alcoholism. Some commonly employed definitions of alcoholism, for example those of the World Health Organization and of the American Psychiatric Association, reflected this strain in the definition of alcoholism, defining alcoholism essentially in terms of a drinking that seemed to cause problems for oneself or for others around one. In this way, what first began as a narrowly-defined focus on deviant drinkers became extended to encompass all sorts of social and personal problems once claimed by temperance advocates.

Perhaps because of this ever-widening conception of "alcoholism," confusion and even evasiveness has entered American conceptions and pronouncements on the relationship between alcohol and serious events. While it is commonplace to read in the newspaper or hear aired over television that n% of traffic deaths, or m% of homicides, or p% of suicides "involve" alcohol or

alcoholics, in fact these assertions do not report a known causal association or a coherent system of ideas about the respective casualties. They are, by now, ad hoc assertions, usually involving a variety of potential meanings comingled together. The intended impact of such propositions is more often emotional rather than enlightening. Often such pronouncements may be voiced in order to gather sentiment on behalf of the seriousness of the "alcohol problem," and by extension the importance of support by agencies that treat and prevent alcoholism. In this mode it is not so much that alcohol is being provided as a putative explanation and implicit plan of action to counter serious events, but rather that the various serious events are invoked as arguments on behalf of the actions routinely pursued by "alcoholism agencies." The link between those actions and the social casualties may be left undescribed and may be undescribable.

Certainly the fact that statements taking the form "a% of casualty b involve alcohol" are presented in earnest and as though they contained a determinate meaning suggests that American commonsense knowledge provides a ready willingness to attribute a wide variety of unfortunate events to alcohol (or something associated with alcohol). Everyday experience teaches us that people under the influence of alcohol behave in a distinctive manner; that people experience alcohol's effects differently; that alcohol's effects may vary at different dosage levels and in differing social situations; that alcohol's effects can be felt in a number of diverse planes -- mood effects, motor coordination, concentration, balance, superego control, etc.; and that even the same person may experience a large variation in its effects at various times. Thus, "ordinary knowledge" has invested in alcohol a variegated repertoire of powers which in turn provide for a rich soil of accounts of unfortunate events.

There may be some important cultural forces at work in the enduring attractiveness of explanations-via-alcohol for serious events where alcohol is shown to be present. For example, efforts to link traffic fatalities to serious design problems in automobiles or to poor road design have given way to socially expensive and time consuming attempts at reforming the drinking driver. A crime attributed to drunkenness may provide an agreeable explanation for that crime because it does not so strongly imply a challenge to the legal norm implied in the crime (thou should not steal) or attest to the criminal's essential deviance -- the alcohol presence in the event may suggest that the act was essentially unthinking and not a reflection of the actor's enduring self. Thus, it offers a potential both to exculpate the actor's guilt and to reaffirm the community's faith in its social norms.

In what sense then does contemporary thought link serious events with alcohol? And what sort of response, based on that link, would be suggested in order to reduce the incidence of such serious events? The literature suggests several observations:

First of all, when a given serious event, E, is linked to "alcohol" in an assertion of the form "n% of Es involve alcohol" it is very clear that different aspects of "alcohol" are brought into play depending on the kind of serious event under consideration. For example, when discussing alcohol's contribution to crime, most researchers have focussed on the amount of alcohol in the actor's bloodstream at the time of the event. But when discussing alcohol's role in suicides, researchers more often switch to the possible relationships between alcoholism and that serious event. Traffic crashes, when first studied for their relation to alcohol, were regarded as a consequence of blood alcohol content at the time of the event; later the argument was advanced that crashes involving alcohol were better characterized

as problem-drinker or alcoholism events; and still later the view has arisen that such events might best be viewed as "life-style" or social structural problems. Thus, the formulation "alcohol occasions serious event" often uses the term "alcohol" to refer to a great variety of different variables including blood alcohol content, alcoholism, drunkenness, low-level blood alcohol, alcohol's congener content, drinking, long-term consumption practices, social norms surrounding drinking, and so on.

Sometimes, specific formulations of potential causal associations between "alcohol" and a given serious event can become complex: for example, the literature has suggested that one cause of suicide among alcoholics is enforced abstinence from alcohol -- here, in other words, the causal assertion involves both alcoholism and drinking, prescribing that among persons addicted to alcohol nondrinking may occasion suicidal acts. It has been suggested, as well, that alcoholism may lead to suicide in the spouse of the alcoholic (Lahelma, 1977); that drinking may buck up one's courage for the suicidal act, or conversely, cheer up the potential suicide so that the act proves to be no longer desirable. Long-term alcoholism may insulate one from suicide because years of heavy drinking degenerates the brain and takes away the capacity for despair. Alcoholism may be associated with suicide through the medium of terminal illness; terminal illness, which is a frequent cause of suicide, may itself be caused by excessive drinking. Or, as Menninger (1938) has suggested, alcoholism and suicide may both derive from a common underlying will to die. Suicide is sometimes suggested to be linked to alcoholism as a result of others' negative responses to alcoholism rather than as a consequence of alcoholism per se.

Even this brief and still incomplete review of one casualty, suicide, shows how variegated are the potential associations between alcohol and the causality and the number of meanings that one might have to attach to the association.

Distinct from the particular aspect of alcohol -- e.g., BAC, alcoholism, etc. -- being employed as the independent variable in the associational statement linking "alcohol" and a given serious event, is the particular power or effect being ascribed to alcohol in order to carry out its putative causal role. Alcohol, both in popular and professional thought, has been imbued with a great many possible effects -- it can be regarded as manifesting effects so diverse as to cover nearly the full range of human emotions and actions. Often without noticing it we attribute to alcohol contradictory or inconsistent powers, depending on the sort of situation we are presented with. Alcohol in one setting, for example, may be examined for its power to soothe and relax drinkers, and in another to make them more aggressive and less self-controlled. Alcohol may be studied for its action as a depressant and as a stimulant. In particular situations, opposite effects of alcohol often seem equally plausible. For example, students of obesity have long known that stress contributes to the desertion of diets among the fat. Thus the addition of alcohol into a person's diet might (because of its relaxant powers) reduce stress and help keep him on the diet. On the other hand, alcohol (because of its disinhibitor effects) might tend to diminish the dieter's capacity for self-control over eating, thus tending to make alcohol a contributor to overeating.

Only very rarely have such contradictory strains in alcohol's powers have subjected to competitive or "crucial experimental" tests. Much more often alcohol has been examined with only one effect in mind at a time. An increasingly common scholarly view is that alcohol may simply serve to magnify or depress the drinker's ordinary responses, a view

that can link alcohol to almost any sort of behavioral effect. Thus alcohol's powers provide something approaching a panchestron (an explain-all) for casualty events. And especially because most such events are accounted for after they have happened (post facto explanation), if drinking were present in the event at all some combination of alcohol-aspect and alcohol-effect could be found to provide an account for the event. These tendencies toward great flexibility and multiplicities of meaning are not confined to commonsense thought, but pervade as well the scholarly and professional literatures. Thus a meaningful and concrete sense of the relation between "alcohol" and serious events requires us to very carefully keep track of what aspect of alcohol and which of (and how many of) alcohol's putative powers is being called into play in a given assertion.

We turn now to a brief description of the sorts of empirical research that have surrounded the various associations between serious events and alcohol.

Major Types of Studies on Alcohol and Serious Events

An empirical study of the role of alcohol in serious events must include at a minimum an alcohol indicator and an indicator of a serious event. To establish the correlation of the two indicators, both must have the opportunity to vary in the population under study. Thus we might study the association of heavy drinking and traffic accidents in a population of persons who may or may not have had traffic accidents and may or may not be heavy drinkers; or we might study the association of drinking and fighting in a population of spectator sports occasions, where drinking sometimes occurs and fights sometimes break out. Considering the simplest case, where the alcohol indicator and the serious event are both measured

dichotomously, such a study allows the measurement of all four cells of the fourfold table:

Serious event:

		No	Yes
Alcohol indicator:	No	a	b
	Yes	d	c

Having established the degree of association with such a study, it would then be logical to proceed to search for the antecedent factors which explain the relationship, for conditions which specify the relationship, and for factors which interpret and explicate the nature of the relationship.

While there are such studies of alcohol and serious events which represent a whole population and allow for multivariate analysis, they are relatively uncommon. Where they do exist, such studies are often unsatisfying, falling back on summary or proxy indicators and pursuing only a curtailed multivariate analysis. The reason for the near absence and limited scope of such studies is apparent: serious events are rare, and only a few events of any particular type can be expected to occur in a reasonably sized sample in a reasonable length of time. Furthermore, heavy drinking or relatively serious drinking problems are not very common in the general population -- distributions of persons on amount of drinking or drinking problems measures are strongly skewed to the lower scores. A study using a general sample frame is thus looking at the correlation of one rare characteristic with another, and usually lacks the cases to pursue the relationship far beyond a raw correlation of summary measures.

The most common types of studies of alcohol and serious events thus do not use a general sample of persons or situations, but rather depend on a sampling frame which eliminates the problem of rarity by focussing only on the rare situations or cases. Most studies use a sample frame defined either around the occurrence of serious events, or around the presence of an alcohol indicator. They thus measure only two cells of the fourfold table, measuring how often alcohol is associated with the serious event (cells b and c) or how often those with a given alcohol characteristic suffer a serious event (cells c and d). There are three major types of such studies; our subsequent discussion of empirical findings is organized around these three types.

Our primary aim in the remainder of this report is to report and comment on the empirical data we found available in the various relevant literatures. In order to do this, we had to order and categorize the various kinds of study we found. The following organization of the literature should not be regarded as a decision on how research should be focused, but as a reflection of how research has been performed.

I. Studies of alcohol use at the time of the serious event

In studies of this type, the sampling frame is a population of serious events. The sample is collected through one or another institutional "window" on the serious event. Mortality is usually measured using the deaths coming into a particular coroner's office or record-keeping system; injury is usually measured with emergency-room samples; crime is usually measured with a sample of arrests or of those incarcerated for a crime. In principle, the population measured is a population of events or people-in-events rather than a population of persons, but since the same person cannot enter a mortality sample twice and will usually not enter an injury or arrest sample twice in

the period of data collection, such samples are conventionally treated as if they were samples of people. Thus in most studies alcohol is measured in only one person in the event, usually the person defined as the victim or as the person responsible for the event. Exceptions to this are "Wolfgang-type" crime studies, (See Crime Chapter), in which alcohol is measured for both the victim and the perpetrator, and some traffic studies in which alcohol is measured for more than one party to the event.

The focus on alcohol in the event is usually directed at one or both of two specific aspects of alcohol: (a) evidence of alcohol influence at the time of the event; (b) evidence of attaining a given level of intoxication at the time of the event. The major means of determining these questions are self-report by the person in the event; report by another, usually official person, that the person in the event "had been drinking"; and measurement of the alcohol level in the breath, urine, or blood.

II. Studies of drinking history and drinking problems of persons in the serious event

Like the first type of study, this type uses as its sampling frame a population of serious events, and thus collects information on only cells b and c of the fourfold table. The difference from the first type is in the greater emphasis on the person rather than the event or person-event as the unit of analysis. Thus studies of this type are interested in drinking measures which are general characterizations of patterns of the person singled out as involved in an event. There are a very wide variety of such measures, so that there is probably less comparability of alcohol measures in this type of study than in either of the other two major types. Measures used have included characterizations of general current drinking patterns, such as quantity-frequency measures; measures of recent or lifetime drinking problems history, such as overall problems scores or general problem-drinking

or alcoholism measures; treatment or other institutional history as a labeled alcoholic; characterization by a knowledgeable -- usually official -- person as a problem drinker or alcoholic; history of specific alcohol problems -- e.g. drink driving arrests. Sometimes measures of alcohol in the event are treated as characterizing the person's general patterns; e.g. it has been argued in the traffic literature that anyone with a BAC over 0.25 must be viewed as an alcoholic.

Studies of this type are of course focused on longer rather than shorter term effects of alcohol. In these studies, there is of course no necessary temporal connection between the drinking and the event; they simply study the joint occurrence of the drinking measure and the event in a person over a substantial period of time -- often a lifetime. Sometimes, the focus is in fact on the overlapping of problems in the population -- the existence and size of a multiproblem population.

III. Studies of the involvement in serious events of labelled alcoholics

In studies of this type, the sampling frame is the alcohol dimension rather than the event dimension; thus the two cells of the fourfold table for which data are collected are c and d. Typically, these studies will examine the casualty or crime experience of a sample of clinical or otherwise labelled alcoholics over a considerable period of time -- either prospectively after the labelling has occurred, or retrospectively in the person's life prior to the institutionalization which defined the case into the sample. Since serious events are rare even in high-risk populations, rates of occurrence in these samples are uniformly much lower than rates of occurrence of alcohol indicators in event-defined samples. Many studies which report data of this type do not discuss it, as they regard it as incidental to the main purpose of the study, which is often evaluation of treatment or drinking history. Sometimes, in fact, the relevant data is reported as an element

of the sampling procedure in the main study -- e.g., enumerating the deaths at follow-up of a treatment population while discussing sample attrition.

While there is considerable variation in the alcohol-related measure used as the sampling frame in this type of study, the criteria used in the measure are often not spelled out, but rather hidden in an institutional label or category. The measure of serious events is also often not well defined, although of course the fact of death or arrest if not the cause or charge is self-explanatory.

Some clinical populations of alcoholics differ in a number of respects other than their drinking patterns and problems from the general population, a high rate of a serious event in this type of study cannot be ascribed to any particular effect of alcohol, or necessarily to alcohol at all.

Filling Out the Fourfold Table

The bulk of the literature on alcohol and serious events, as we have just described, directly measures only two cells of the fourfold table. There is a considerable utility in this type of study, at least in indicating promising places for future work. Beyond this, studies of the detailed sequence and process of serious events and alcohol's place in them are surprisingly rare, and are needed as a crucial base of knowledge in designing any strategies to minimize the harmful effects of drinking.

But a study which measures only two cells of the fourfold table will not by itself answer the question of the degree of association of alcohol with the serious event. To answer that question, the fourfold table must somehow be filled out.

A traditional way of filling out the table has been by assumption. And indeed there is something to be said for accepting the obvious: where alcohol is involved in a high proportion of serious events, it may seem

superfluous to check on the distribution of alcohol when the event is not occurring. But as the U.S. becomes wetter as a culture, the probability of a high alcohol involvement in the absence of an event grows. France, the traditional prototype of a "wet" culture, offers an example in this regard. A study of accidents on the job found BACs above .05 in 30% of the events; but at the same time it found BACs above this level in 23% of a sample of fellow workers not involved in accidents (Ledermann and Metz, 1960).

One way to fill out the fourfold table is, of course, by a study of a full population which includes all four cells. As we have discussed above, this strategy is made difficult by the general rarity of the two characteristics involved. A few studies have used this strategy, however (see, for example, Brenner, Cisin and Newcomb, 1966), and it seems capable of further development. General population studies have by no means tested the limits of what can be learned retrospectively or prospectively about individuals' histories of drinking patterns and of serious events, and much could be learned from more detailed inquiries along this line. Such designs would be particularly appropriate for events which are still serious but not fatal -- injury rather than mortality, suicide attempt rather than completion, assault rather than murder. Such events are up to a hundred times more common than the fatal events on which the literature has lavished the most attention. Such studies bring the benefit of the flexibility of multi-variate analyses.

The general population strategy (including studies of high-risk subgroups such as young men) is potentially a generalization of studies particularly of Types III, since they are person-based studies. A generalization of Type I studies requires a sample of situations or occurrences (or of persons in situations), and the conceptualization and methodology of this is not as well worked out as sampling definitions and strategies for persons. A

general-purpose study of a sample of persons-in-situations would presumably need to be based on a detailed understanding of the proportion of time people spend in various situations and on various activities (see, for example, Szalai, et al., 1972). Ample precedent for specific-purpose studies of samples of persons-in-situations is provided by the various probabilistically-designed roadside breathtesting studies carried out in recent years (e.g., Wolfe, 1974). As in these studies, which tend to concentrate on weekend and nighttime periods, general studies of persons of persons-in-situations would probably concentrate on circumstances with greater risk of a serious event.

The third way of filling out the table is with a control sample or population. In epidemiological terms this means a retrospective rather than a prospective design, and the epidemiological literature offers ample discussion of the pitfalls of this method. Nevertheless, the case-control and other control-population designs continue to be necessary tools in the study of rare conditions and events.

Controlled studies are especially crucial in alcohol research because drinking patterns in our society are quite highly specific -- males drink more than females, younger adults drink more on an occasion than older adults, styles of drinking vary by social class and ethnoreligious group. Drinking is predominantly a leisure-time activity in the United States, and a frequent accompaniment to specific activities, such as partying, watching football on television, or boating. Drinking, and particularly heavy drinking, is more common in the evening than in the morning, more common on Friday and Saturday evening than at other times. Heavy drinkers and heavy drinking situations vary from others also on many non-drinking characteristics. Most importantly, norms of behavior while drinking vary

considerably between different social groups and situations: an equal amount of alcohol may make people in one situation quiet and in another reckless.

Different kinds of serious events also occur in quite specific circumstances and to different classes of people. For example, overall, accidents are predominantly a male phenomenon. Patterns by age vary by class of accident. Drownings are more frequent in summer, fires in winter. Occupational accidents as conventionally defined can happen only to those who are employed. These and many other factors may covary and contrast with patterns and locations of drinking.

The relevant control design is somewhat different for each of the three major types of study. In studies of alcohol in the event, the control sample is a sample of people in equivalent situations where an event has not occurred. This type of study is most highly developed in the traffic field, where it dates back to Holcomb's pioneer study (1938); but the method has also been applied to such circumstances as pedestrian falls in public places (Honkanen et al., 1976). Typically, such studies control for physical and temporal characteristics of the event -- time of day, weather conditions, etc. -- and sometimes for personal characteristics -- age, etc. At a time and place determined by such controls, a person is stopped and tested for alcohol in the body, and this sample of person-in-situations fills out the remaining two cells of the fourfold table.

There is room for doubt whether such a method controls for all factors other than drinking which might contribute to the event, so that it cannot be assumed that the difference between the proportions of alcohol involvement in the event-group and the control-group represents the effects of alcohol. On the other hand, tightening the net of controls ever tighter around

a serious event situation can reduce the method in the end to absurdity: the researcher may end up looking for matched controls in a particular neighborhood who are on a rickety ladder in a high wind, that is, in a situation in which no sober person in his right mind would find himself.

In studies of the drinking history and drinking problems of persons in the serious event, there is considerable opportunity to find control data in existing general population samples. For example, in discussing suicide below we report on an effort to apply data on drinking behavior in a general population as a control comparison to Beck et al.'s study of attempted suicides (1975; 1976). Of course, this type of controlled study, while giving a general indication of the strength of relationship of alcohol measures and serious events in persons, gives little indication of the nature of the role alcohol may play in the events. Nevertheless, in future studies of samples of events, it would seem worthwhile to enquire about general drinking habits and problems as well as alcohol in the event, if only to allow a comparison in comparable form with general population data on drinking habits and problems.

The control population has perhaps been most widely used in studies of the third type, studies of the involvement in serious events of samples of labelled alcoholics. It is primarily mortality that has been subjected to such comparisons, because of the ready availability of mortality statistics for the population in general. These comparisons are generally reported in the form of a relative risk statistic, showing how much more likely a member of the alcoholic sample is to die of the specified cause than a member of the general population. Normally such comparisons are controlled or standardized by age and sex. In interpreting such comparisons, it should

be borne in mind that a high relative risk may not indicate a substantial absolute level of risk; that the clinical population is unlikely to be evenly drawn, geographically or otherwise, from the comparison population; and that the alcoholic population typically differs from the general population in many ways other than in drinking habits, age, and sex. In interpreting studies of alcoholics it cannot be assumed that a high rate of crime or greater risk of accident or suicide is due to alcohol use (Pell and D'Alonzo, 1973).

Controlled studies have primarily been done for accidents rather than crime or suicide. This partly reflects the different trainings of workers in the different fields: the controlled study is an epidemiological rather than criminological stock-in-trade. Control comparisons are certainly a logical extension of Type II and Type III studies of alcohol and crime. However, the concept of a controlled study seems to break down for Type I studies of events such as suicide and crime where intention enters in. It does not seem to make much sense to measure the alcohol of a customer in the store at the same time and place that a holdup occurred on a previous day, or of a pedestrian on a bridge where a suicide occurred. Where intention is explicitly part of our definition of the situation, we assume that alcohol affects intentions, and that the choice of the context for the event is in turn affected by intentions. Of course, these assumptions are not necessarily true: many crimes are crimes of opportunity in a chance situation. But the seeming incongruity of a case-control study of alcohol in the criminal event should sensitize us to potential problems in the use of such studies for accidents, since in these situations too intentions and a voluntary choice of the context of behavior are potentially involved.

Alcohol's Involvement in Serious Events As Seen in the Major Types of Studies

The results of controlled and multivariate studies will be discussed in detail below; for the present let us concentrate on the picture of alcohol's role in serious events provided by the three major types of studies. This type of study is the prime source of the single-number estimates of the proportion of crimes or accidents "due to alcohol" which so often form a prominent part of statements of the magnitude of alcohol problems in our society.

Charts I, II, and III, which show respectively the ranges of findings for the three major types of studies for various classes of serious events, are in general based on serious empirical studies performed in industrialized countries, with special emphasis on U.S. studies. Charts I and II generally use whatever alcohol indicator was featured in the original study; in many cases this was any evidence of alcohol in the situation. Because of the vastness and greater sophistication of the traffic literature, traffic accident studies in all three charts are confined to U.S. studies. In Chart I, for traffic studies only, a BAC of .10 or above is used wherever possible as the criterion for alcohol involvement.

The charts are in general arranged in the terms which the detailed discussions below will follow, under five major headings, and a series of subheadings. Because of their very different incidences, studies of fatalities and non-fatalities are separated; in some cases non-fatality studies include a small proportion of fatalities. For crime, a distinction is made between the "offender" and the "victim"; in traffic accidents, the distinction between "responsible" and "non-responsible" is more or less functionally equivalent, although without the same degree of moral opprobrium. Family abuse studies in the table are all of "offenders." In accidents

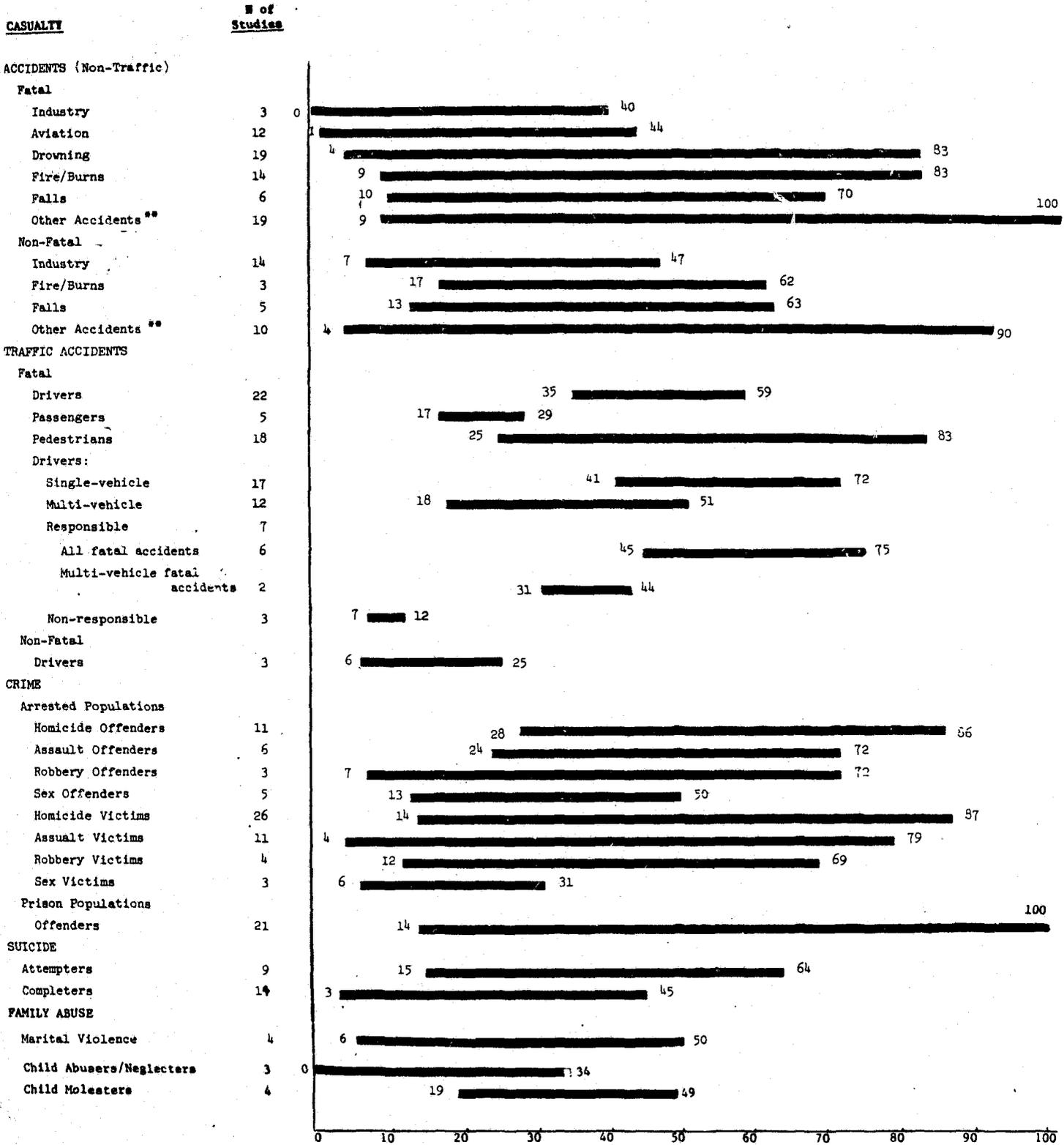
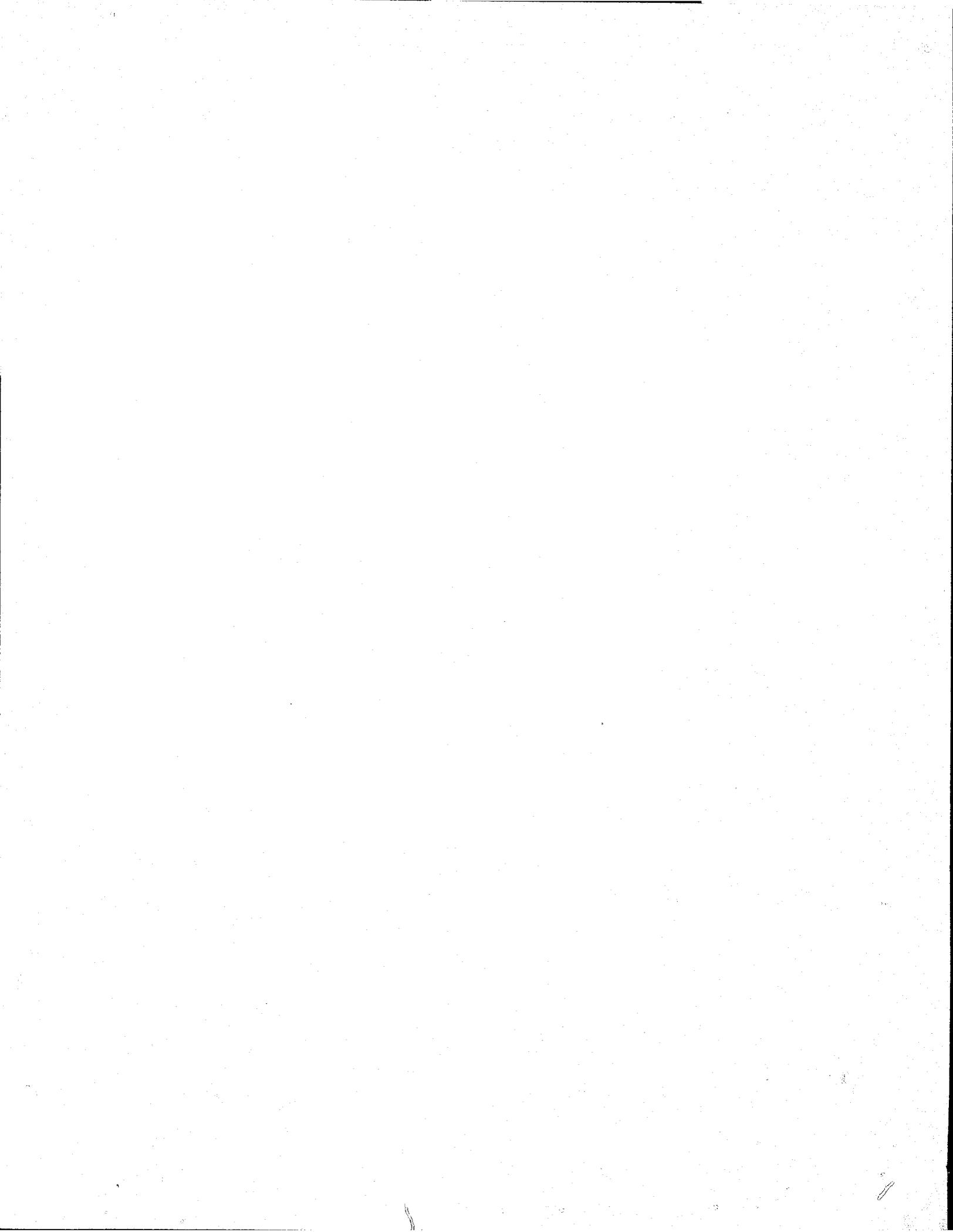


CHART I: SUMMARY OF STUDIES REPORTING ALCOHOL INVOLVEMENT*
AT THE TIME OF THE CASUALTY (IN PERCENT)

* Studies use measures such as BACs, police reports of drinking, witness reports, self-reports.
** Includes for example poisoning, food asphyxiation deaths (choking), frost injuries and deaths.



CASUALTY

N of Studies

ACCIDENTS (Non-Traffic) --
TRAFFIC
Accidents 2
DWI Offenses 7
CRIME OFFENSES 9
SUICIDE ATTEMPTS 9
FAMILY ABUSE --

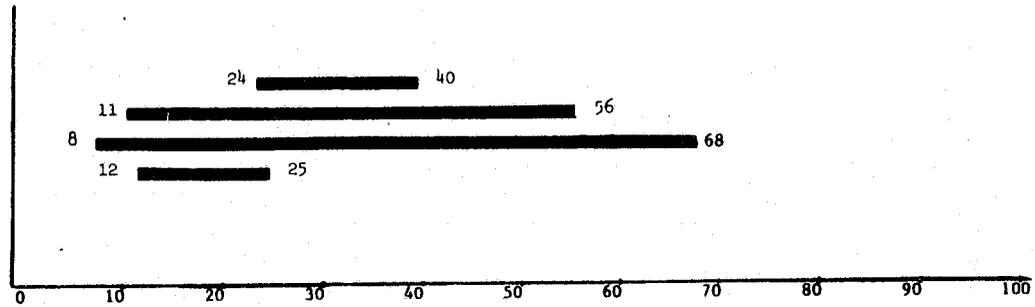


CHART IIIA: SUMMARY OF STUDIES REPORTING THE NON-FATAL CASUALTY INVOLVEMENT OF LABELLED ALCOHOLICS (IN PERCENT)

CASUALTY

N of Studies

ACCIDENTS (Non-Traffic)
Drowning 3
Fire/Burns 3
Falls 4
Other Accidents * 8
TRAFFIC ACCIDENTS 6
CRIME
Homicide Offense 4
Homicide Victim 2
SUICIDES 20
FAMILY ABUSE --

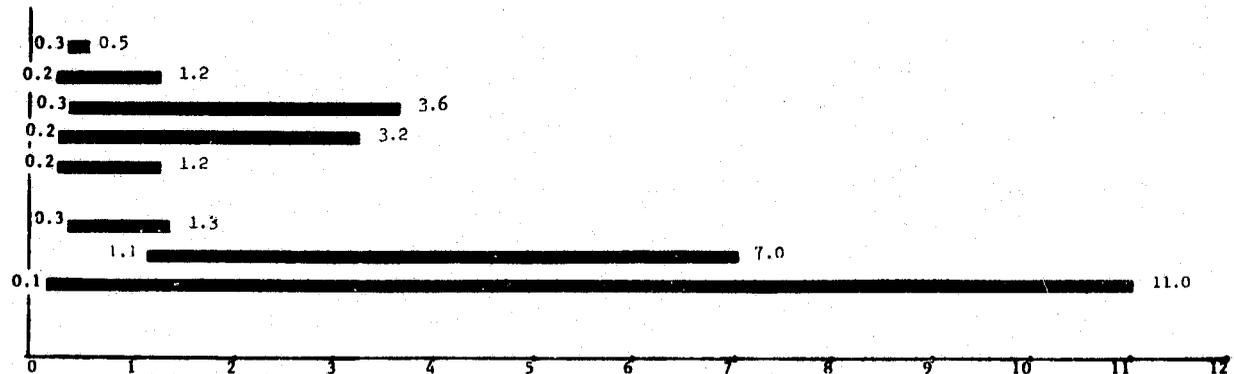
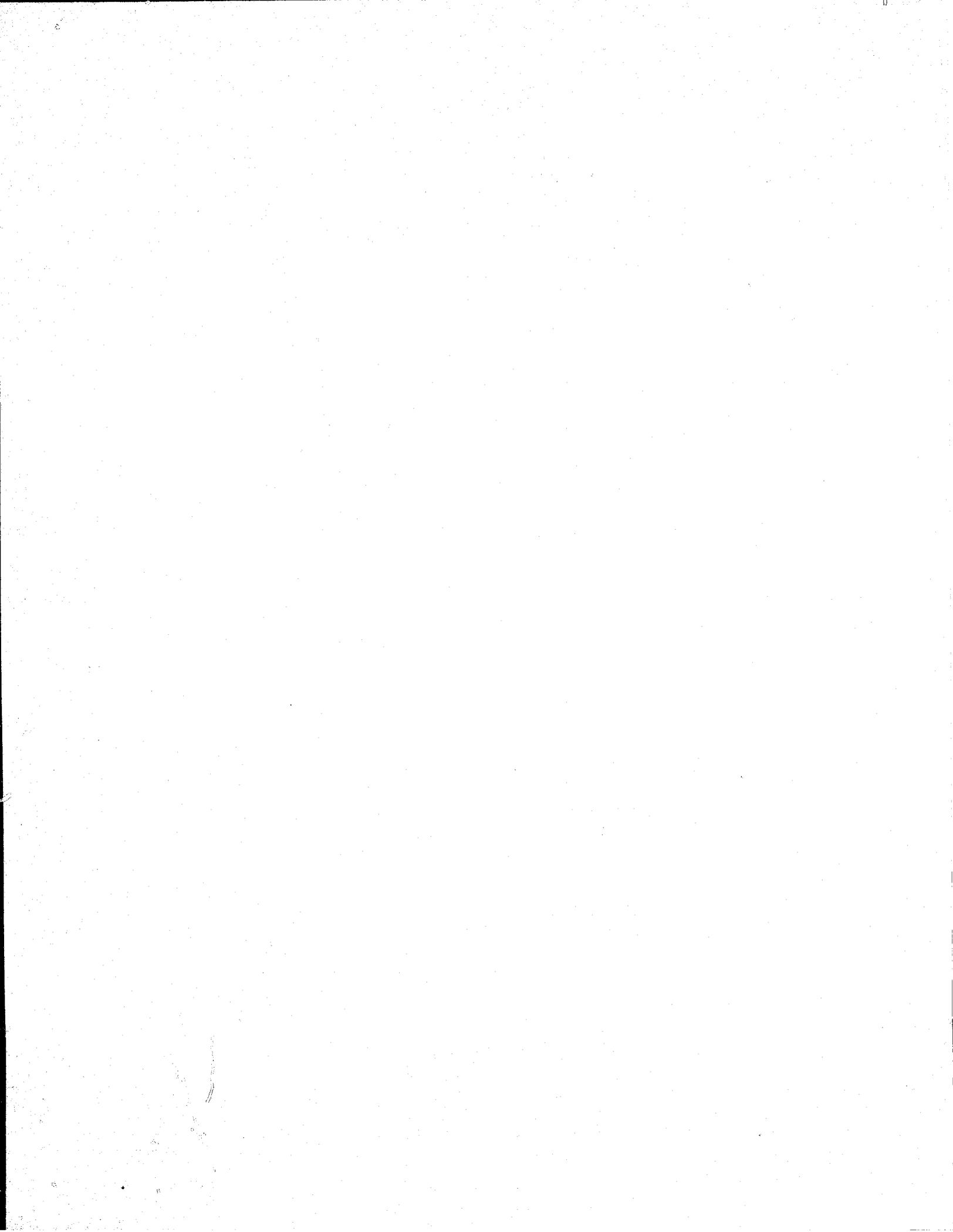


CHART IIIB: SUMMARY OF STUDIES REPORTING THE FATAL CASUALTY INVOLVEMENT OF LABELLED ALCOHOLICS (IN PERCENT)

* Includes, for example, poisoning, food asphyxiation deaths (choking), frost injuries and deaths.



generally, everyone is assumed to be a victim; in suicide, of course, the offender and victim are one and the same.

It is worth first paying some attention to the number of studies of the various types and of the different kinds of serious events, although because of duplication and selection criteria the numbers shown are only rough guides, and seriously underestimate the size of the traffic literature.

Type II studies are the most numerous for child abuse, child molesting, prison population, and suicide studies. For suicide completers, all three types of study are well represented. For the other areas -- arrest studies, marital violence, and studies of all types of accidents -- Type I studies are the most numerous. In general, this distribution of study types may be seen as reflecting assumptions about the issue of intention; for putatively unintended events, a contextual approach seems most relevant, while when intention is involved characteristics of the person's history became salient.

There is a very wide disparity in the number of studies devoted to each class of event. Overall, the family abuse area has the fewest empirical studies of alcohol involvement. While all other general classes of events have a substantial number of studies, the studies are differentially distributed among specific events, and in every accident area except industrial accidents studies of fatalities are more numerous than studies of injuries. Within the field of study of serious events, that is, the emphasis is on the rarest and most extreme kinds of event.

Turning to the ranges of reported alcohol involvement in Charts I and II, the overall impression is of the tremendous range of results reported. In general, the larger the number of studies in an area, the wider the range of results. The restrictions of location and alcohol measure for traffic accidents in Chart I seems to result in somewhat smaller ranges in categories

with a large number of studies, but the variation remains quite large. The main effect of the restriction seems to be in raising the lower limit of the range.

The lowest upper limit of findings for any category in Chart I is 25% for the 3 studies of drivers involved in non-fatal accidents -- probably the most common class of serious events in the table. Only four of the 32 categories in the chart shows upper limits below 40%, and 8 below 50%. A writer seeking to state the maximum case for alcohol's role in serious events and impact on society can thus find ample grist for the mill in the epidemiological literature. On the other hand, a writer with the less common agenda of minimizing the role of alcohol can find figures below 20% for all except five categories: drivers in fatal and single-car fatal accidents, pedestrians in fatal accidents, and homicides and assault offenders.

The few categories in Chart II which have substantial numbers of studies show especially large variations in findings, partly reflecting the wide diversity of drinking history measures used in this type of study. But only in the cases of family abuse and suicide completers does the highest percentage in a category exceed the highest percentage for that category in Chart I.

Chart III again reveals a wide disparity between studies in the casualty and crime experience of samples of alcoholics. A comparison of the two charts underlines the fact that, even in such special samples, fatal events are a small subclass of serious events. The general picture, confirmed in the discussion of controlled comparisons below, is of a population relatively high risk of serious events.

Methodological and Reporting Problems

As Charts I, II and III show, even studies which use similar samples of events manifest wide variation in estimates of alcohol involvement. Some part of this variation is due to the methodological and reporting problems found in studies of these types. The most common problems and those which create the most serious problems of comparability across studies are definitions of the casualty events, variation in sample parameters, and problems in alcohol reporting.

Definition of the Casualty Event

While the definition and identification of some casualties, such as traffic crashes, are clear cut, others are not. In family abuse, for example, the line between disciplinary punishment of a child and child abuse may not always be a clear one; the same is true of normal fatherly affection for a daughter and incestuous activity. Determining whether a death is due to poisoning or firearms may be easy, but to determine if the death was an accident, suicide, or homicide may prove very difficult. Some of the definitional constraints are cultural. Suicides are less likely to be reported, as such, in Catholic countries or by a doctor treating a family friend. Other definitional problems result from the failure of investigators to define the criteria for labelling a casualty event. Often the definition of the event is determined by an unreported combination of the physical evidence and statements from witnesses or the victim; without such statements, a fall cannot always be distinguished from an object falling on the victim or, for that matter from an assault. Drinking-involved events, however, may be less likely to have witnesses to help untangle these issues: a large proportion of the alcohol-involved drownings studied by Giertsen (1970) were unwitnessed. Legal considerations also account for definitional variation. Child molesting may be

labelled statutory rape or lewd and lascivious conduct. A criminal offender may be sentenced for assault when the actual crime and criminal intent was robbery.

In most of the casualties, fatal events are easier to define and identify. Therefore, research often overemphasizes the fatal event, even though non-fatal events may occur with much greater frequency. (Traffic accidents, for example, account for 46,000 deaths and 1,800,000 injuries a year, National Safety Council, 1976.)

Sample Parameters

Selection and attrition which occur in one form or another as part of the routine social processing of these events work, to create biased samples of events and people-in-events. In studies of accidents, suicides, and homicides, the coroner and hospital emergency room frequently are sources of data. Yet, depending on the jurisdiction, coroners may not see cases which are under a private physician's care, so that a sample drawn from coroner's cases may underrepresent those who are relatively well-off. Hospital emergency rooms also draw a mixed bag of severe accident cases and persons who have no other ready source of medical help even for minor problems. Studies of various crimes, including such diverse offenses as child molesting, drunken driving and homicide, are affected by a criminal justice process which selectively reduces the original sample of offenders.

Another form of sample attrition occurs when an investigator reduces the sample for analysis to those cases which have been tested for the presence of alcohol. Although this is a common procedure, almost none of these studies analyzed the characteristics of the sub-sample tested for alcohol against the full sample to see if they varied in other significant features.

Alcohol Reporting

As Charts I and II indicate, alcohol measurement has two foci in these literatures. Chart I reports variation across casualties in alcohol use at the time of the event. Chart II reports drinking history and drinking problems of persons involved in serious events. Within each of the different broad types of studies there is considerable variation in alcohol measures. Alcohol use in the event is measured most commonly by self-report in studies of attempted suicides, by BAC in studies of completed suicides, and accidents including traffic, and by police reports in family abuse, and in crime. Alcohol in the life history of persons involved in these various events is measured rather consistently by psychiatric diagnosis in studies of attempted suicides; but for all other casualty areas, measurements vary widely from study to study.

Such diverse measurements as prior treatment for alcoholism, quantity-frequency measures, personal histories of alcohol related problems and/or arrests, high BACs and liver cirrhosis are all used. Each of these measures suffers from problems in reporting.

The most common measure of alcohol involvement in serious events is blood, urine, or breath alcohol content (all are referred to here as BAC). While there are some problems in reliability in measurement of BACs, the major issues are selectivity and timing. In life-threatening situations, taking a BAC will not rank high among the emergency room physician's or highway patrolman's

priorities. In coroner's studies, BACs are often performed only on cases where it is suspected alcohol is present. Alcohol-involvement findings are with rare exception reported as a percentage of only those persons on whom BAC measurements were taken rather than as a percentage of the entire sample, thus inflating the findings of alcohol involvement to the extent that the coroner guesses correctly. Chemical tests which measure alcohol in the blood, urine, or breath, although the most precise measurements of alcohol involvement, must be taken with a relatively short period of time after the victim or offender's last drink to register positive, the exact time period varying with both body weight and initial BAC. This is a serious constraint on their use with criminal offenders. Because of low and delayed clearance rates few criminal offenders can be tested for BAC within a short time of the offense. Also, because no implied consent ruling operates in areas of criminal jurisdiction other than traffic, offenders can refuse to cooperate with alcohol testing. BACs are often taken, therefore, on only a select subsample of victims or actors in casualty events.

Research on victims of serious events is particularly plagued by problems resulting from BAC measurement. Victims of aviation crashes, drownings, or homicide may not be found for days. When a body putrefies, an alcohol-like substance is formed and may influence the BAC measurement. Experts apparently disagree on the validity of BAC measurements in charred bodies. When the victim is alive or lives for a period beyond the event, alcohol will metabolize and be lost to measurement in the intervening time. These factors, which are often not discussed or measured in BAC accident studies, can have a very substantial influence on findings.

Besides the methodological problems, there are substantive issues raised by the general reliance on blood-alcohol level as an adequate measure of alcohol in the event. Blood-alcohol level may only very roughly correspond to the

kind of behavioral and psychological effects of alcohol which studies of alcohol in the event are interested in probing. For example, traffic studies have shown that the same blood alcohol level has markedly different effects on the relative probability of crash-involvement for various age groups. Norms of behavior while drinking vary considerably between different social groups and situations: an equal amount of alcohol may make people in one situation quiet and in another reckless.

Witness reports, whether those of an arresting officer, friends, or family may be biased by factors such as prior knowledge of the person's drinking history, failure to admit evidence where it exists, or fabrication of evidence where it does not exist. Data on the degree to which police report of drinking at the time of the crash corresponds to blood alcohol content suggests that although there are inaccuracies in both directions (over-estimating and under-estimating the presence of alcohol in police reports), overall, police reports of alcohol-involvement underestimate the actual degree (as measured by BAC) to which alcohol is present in accident-involved persons (Waller, 1971). Noting "alcohol presence", alone, says nothing about the level of intoxication. Knowing the degree of intoxication is especially important for theories which include appeals to the physiological effects of alcohol in their explanations of the alcohol/casualty connection.

Self-reported alcohol involvement is often used in studies of crime, marital violence and suicide attempts. Self-reports may be affected by both the memory and intent of a victim or offender. Either of these factors could work to enhance or disavow the involvement of drinking. Victims of crimes may be reluctant to admit drinking involvement for fear of being perceived as responsible. Similarly, drivers in traffic accidents may be afraid of enhancing legal responsibility for an accident. On the other hand, self-reported drinking

may be over-stated by various criminal offenders to disavow their crimes, thus minimizing their responsibility for these socially unacceptable acts. Recent work on self-reported drinking involvement of criminal offenders suggests, however, that the hypothesis that alcohol is commonly used to disavow deviant acts is not an important source of bias in self-report data of this type (McCaghy, 1968; Roizen, 1977; Bartholomew, 1968).

Varied intellectual and professional perspectives toward problem drinking and alcoholism leave open the broadest area of discretion in measurement for the investigators measuring drinking problems and individuals reporting them. If the alcohol measurement consists of psychiatric diagnoses based on medical histories or previous treatment of alcoholism, the cases identified may include the most severe cases of alcoholism, not a representative sample of all alcoholics. If identification depends on reports by relatives, friends or the subject himself, validity will depend largely on the incentives for reporting. Few relatives, for example, would want to admit that a lost relative was an alcoholic. Even a fairly objective measure such as quantity/frequency is commonly subject to measurement error. In one study a comparison of two estimates of total consumption, one based on a self-reported quantity/frequency measure, another based on sales statistics showed self-reports to underestimate total consumption by one third (Room, 1971). Furthermore, operational definitions of types of drinkers based on measures of quantity/frequency vary from study to study. A measure such as "excessive" drinking, on the other hand, has no clear referent at all.

It has been shown that scores on the Michigan Alcoholism Screening Test, a common diagnostic measure of alcoholism, are largely influenced by whether the person has had treatment or not. Additionally, most alcoholism measures, which purport to measure a single entity, take one or a few of several items to identify an alcoholic. Thus, persons with the same label can have received

that label on the basis of a diverse set of criteria.

The validity of alcohol findings is affected by both the partial measurement of and reporting of drinking and drinking problems, as well as the unreliability of the alcohol measures employed. These problems cast doubt on the findings presented in individual studies, which in turn lessens comparability between studies, both within casualty areas as well as across casualties.

Interpretation of Findings

Existing research on alcohol in serious events measures association and not cause. Yet in popular accounts, the results are interpreted as indicating cause. Often the studies themselves contribute to this interpretation.

Contemporary and historical writers alike pay obeisance to the difference between an association and a "cause". John Koren in 1916 wrote:

"The assurance with which intemperance is held responsible for the mass of criminality has at any rate the merit of being quite natural. When an offense is committed in a state of intoxication of by a habitual user of strong drink, the causal relations seem unmistakable, even inevitable, no matter how infinitely complicated the problem appears to the criminologist. . . We are still confronted with the question: Assuming that alcohol had never existed, how many and which of the criminal acts perpetrated during a period would not have been committed?"

The Commission on the Causes and Prevention of Violence in 1968 argued:

"There is no direct causal connection between alcohol, drugs, narcotics and violence. No drug, narcotic, or alcoholic substance presently known will in and of itself cause the taker to act violently. . . . Significant correlations can only note the joint presence of two or more variables, and do not necessarily indicate that one variable, i.e., alcohol, is the cause."

These statements, which serve to pay respect to scientific canon, are ignored, by and large, when the writer returns to the empirical data. The empirical data invariably is used to enhance the alcohol casualty relationship, while the interpretive remarks clothe the data in scientific respectability.

The ambiguities in the scientific vocabulary of contemporary social scientists and other analysts of social problems created by the failure to clarify the relationship between the structure of the data (which tends

toward supporting a direct link between drinking and casualties) and theory (which often fails to establish a direct link) are very great. An example is found in the report on "The Role of Alcohol, Narcotics, Dangerous Drugs in Individual Violence" carried out for the Commission on the Causes and Prevention of Violence. Several statements taken from this report show the explanatory confusion and mix of causal and associational languages found in work of this sort.

"Alcohol seems to have only a minimal involvement in robbery."

"While the relationships . . . between alcohol and violent crimes are highly suggestive, they cannot, of course, be construed as causal connections."

"It has been pointed out, however, that the causal relationship does appear to exist in many instances between alcohol and violence."

"Although they have certain methodological deficiencies, existing data very definitely show an important relationship between alcohol and violent behavior, including suicide and automobile accidents. In fact, as will be shown in subsequent parts of the chapter, no other psychoactive substance is more frequently associated with violent crimes, suicide, and automobile accidents than alcohol."

"A significant association also existed between alcohol in the homicide situation and the method of inflicting death in the Philadelphia study."

"Supporting evidence for the important role played by alcohol in the criminal homicide situation comes from many other sources."

"Because it is known that alcohol functions for most persons as a 'disinhibitor,' this association with impulsive acts is not surprising."

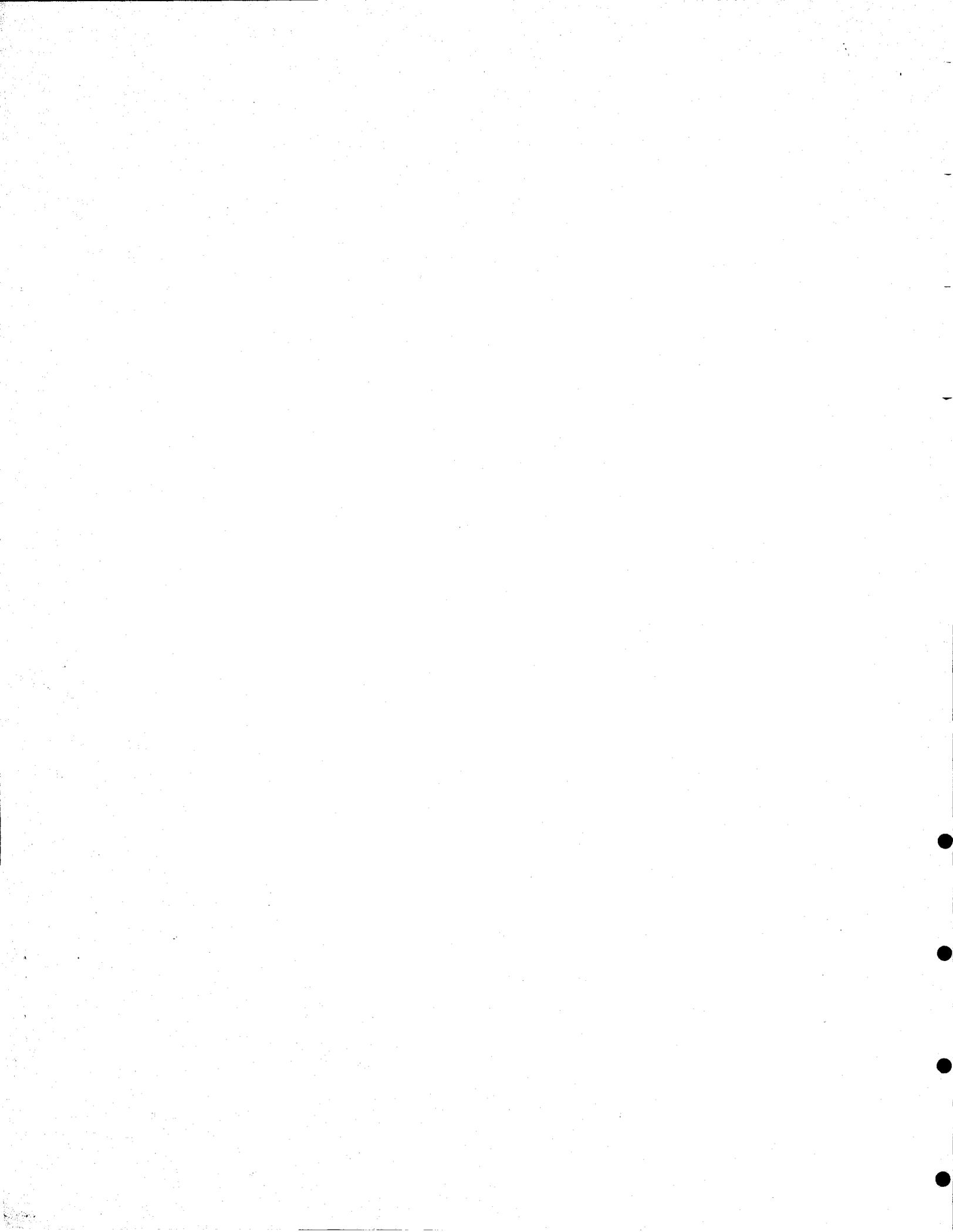
"In sum, the probability that alcohol will be involved in the criminal homicide situation is high; when involved it is most likely that both the victim and the offender will be drinking."

"A statistically significant relationship was found between 'victim precipitation' and drinking by the victim alone as well as between 'victim precipitation' and drinking by both victim and offender."

Associational research surely does not tell us which factors are responsible for the occurrence of serious events, neither does it serve, in most cases, to facilitate more complete explanations. Serious events are "caused"

by multiple factors. But by common habits of thought and language, we do not recognize the possibility that statements such as "80% of highway accidents are due to improper speed," "80% of highway accidents are due to fatigue," "80% of highway accidents are due to poor design," and "80% of highway accidents are due to alcohol" could all be simultaneously true in a world where "cause" means "responsibility in conjunction or interaction with other defined factors."

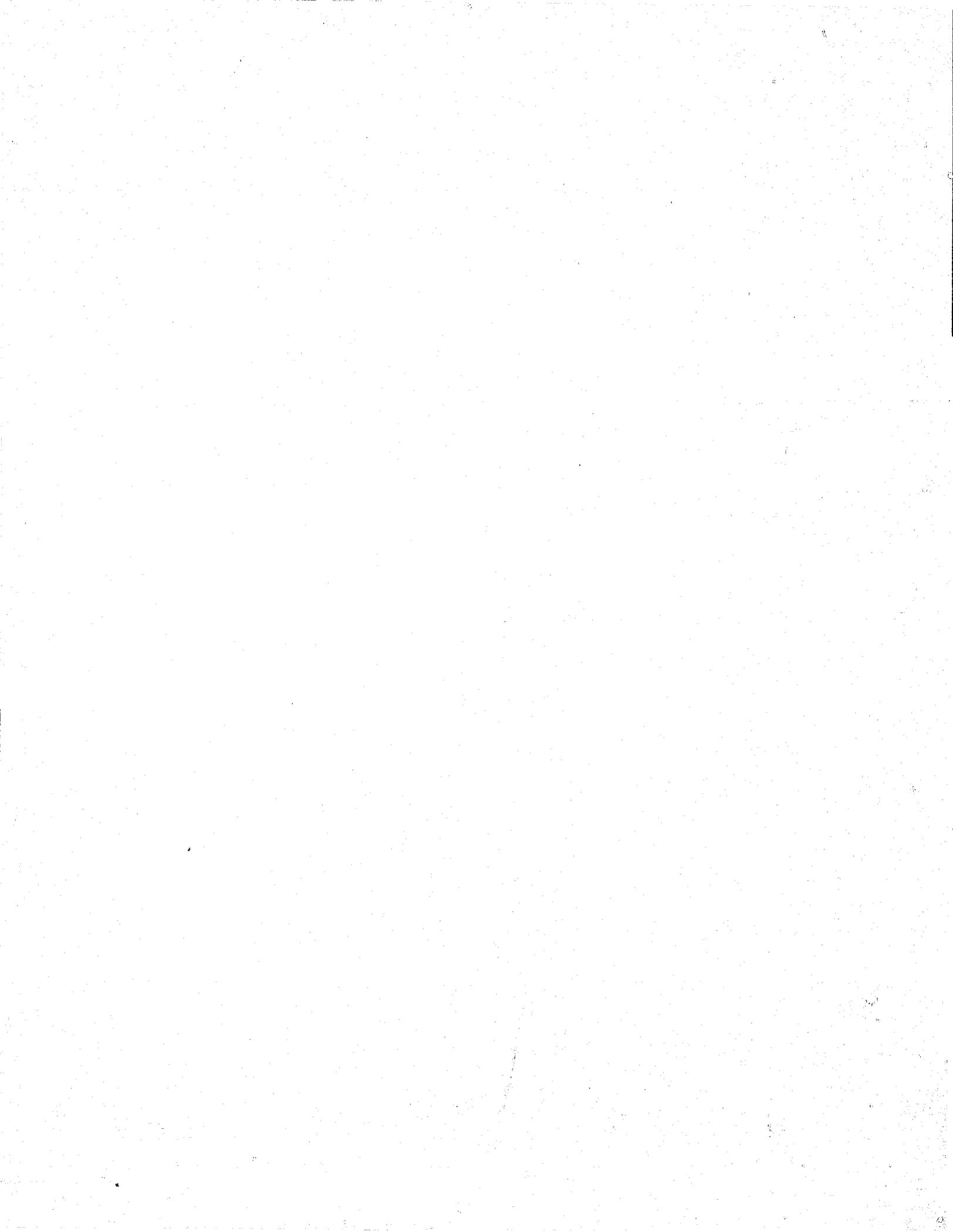
By their ill match to the multifactorial reality, the prevailing rhetoric of single causation and the study designs it fosters, offer ample scope for problem obscuration or enhancement. Those with vested intellectual or material interests in an event can seek to claim the event for a particular factor as cause by measuring or failing to measure other important contributory factors. Thus no study in the burgeoning field of "victimology" appears to have measured alcohol in the victims, perhaps because this might imply some responsibility of the victim for the event. Conversely, the automobile industry, under pressure concerning safety and design from Ralph Nader, might well have welcomed the focus on the drinking driver in the highway safety literature of the late 1960's. Naturally, agencies concerned with alcohol and the literatures they support emphasize the alcohol dimension in their studies of causes of serious events, and the results are used in efforts to enhance the public perception of alcohol as a cause of the events. As we seek methods of minimizing alcohol-related casualties and crime, it is as well to set aside single-factor rhetoric and to examine all the various factors, any of which, if changed, might prevent the event.

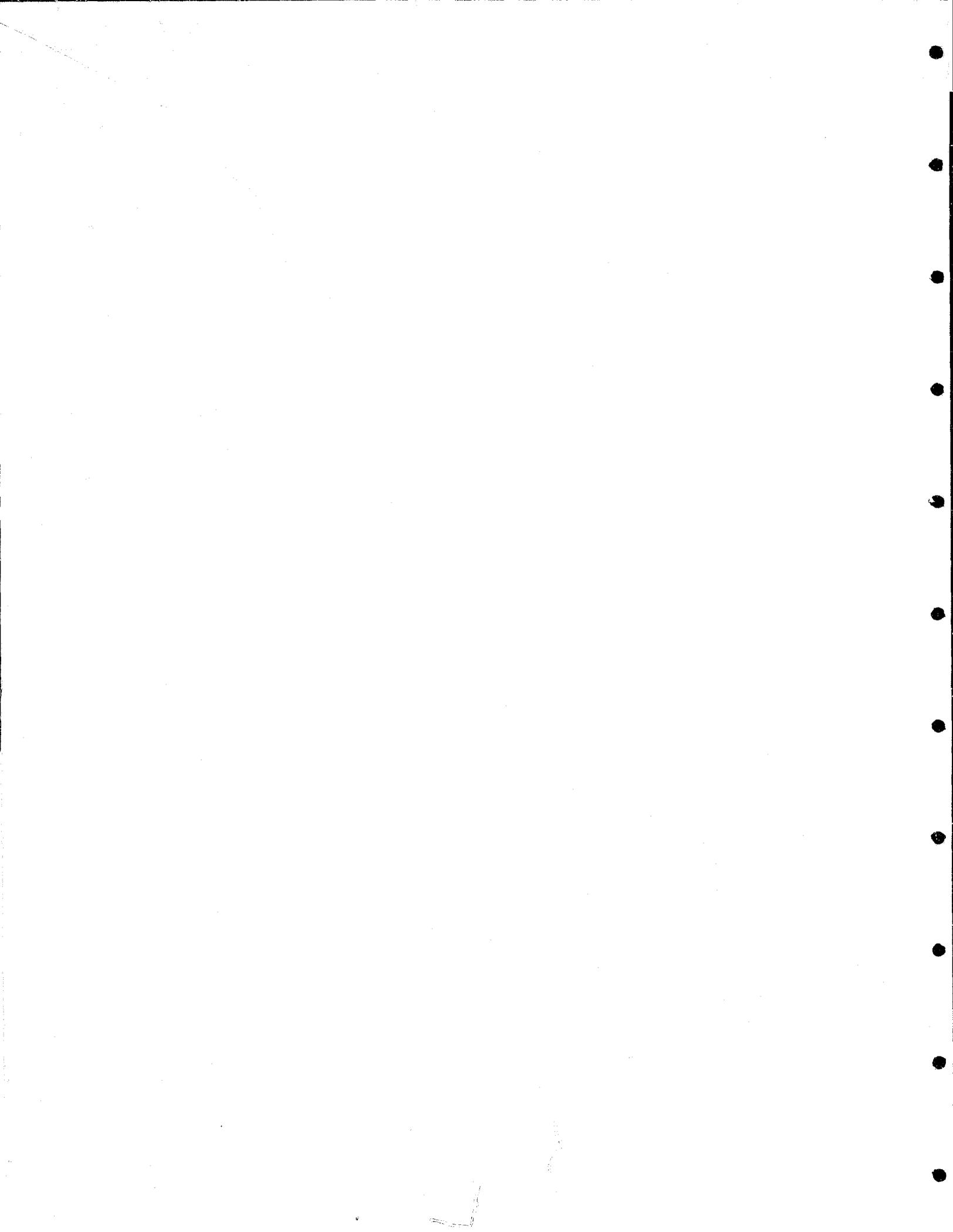


BIBLIOGRAPHY

- Bacon, S.D.
1969 "Meeting the problems of alcohol in the U.S.A." Pp. 29-36
in: M. Keller and T.G. Coffey (eds.), Proceedings of the 28th
International Congress on Alcohol and Alcoholism, v. 2, Highland
Park, New Jersey: Hillhouse Press.
- Bartholomew, Allen A.
1968 "Alcoholism and crime." Australian and New Zealand Journal
of Criminology, Vol. 1, No. 2, pp. 70-99.
- Beck, A.; Beck, R. and Kovacs, M.
1975 "Classification of suicidal behaviors: I. Quantifying intent
and medical lethality." American Journal of Psychiatry, Vol. 132,
No. 3, pp. 285-287.
- Beck, A.; Weissman, A. and Kovacs, M.
1976 "Alcoholism, hopelessness, and suicidal behavior." Journal
of Studies on Alcohol, Vol. 37, No. 1, pp. 66-77.
- Brenner, Berthold; Cisin, Ira H. and Newcomb, Carol
1966 "Drinking practices and accidental injuries." Presentation
at session on Alcohol Use and Accidents of the Society for
the Study of Social Problems, Miami, Florida, August 28.
- Commission on the Causes and Prevention of Violence
1968 "The Role of Alcohol, Narcotics, Dangerous Drugs in Individual
Violence." Report, Chapter 15, Vol. 12.
- Epstein, T.
1977 "A socio-legal examination of intoxication in the criminal law."
Berkeley, CA: Social Research Group, Working Paper F-53.
- Giersten, J. Chr.
1970 "Drowning while under the influence of alcohol." Medical Science
Law, Vol. 10, pp. 216-219.
- Holcomb, R.L.
1938 "Alcohol in relation to traffic accidents." JAMA, Vol. 3, No. 12.
- Honkanen, R.; Ertama, L.; Kuosmanen, P.; Linnoila, M. and Visuri, T.
1976 "A case-control study on alcohol as a risk factor in pedestrian
accidents: A preliminary report." Modern Problems of
Pharmacopsychiatry, Vol. II, pp. 1-5.
- Koren, John
1916 Alcohol and Society. New York: Henry Holt and Company.
- Lahelma, Eero
1977 "Alcohol-related casualties and social problems in the Nordic
countries." Berkeley, CA: Social Research Group Report C-20.

- Ledermann, S. and Metz, B.
1960 "Les accidents du travail et l'alcool." (Industrial accidents and alcohol.) Population, Paris, Vol. 15, pp. 301-316.
- Levine, Harry Gene
1977 "Colonial and Nineteenth Century American Thought about Liquor as a Cause of Crime and Accidents." Berkeley, CA: Social Research Group, Paper No. E-48.
- McCaghy, C.H.
1968 "Drinking and deviance disavowal; the case of child molesters." Social Problems, Vol. 16, No. 1, pp. 43-49.
- Menninger, Karl
1938 Man Against Himself. New York: Harcourt Brace and Company.
- National Safety Council
1976 Accident Facts: 1976 Edition. Chicago, Illinois: National Safety Council.
- Pell, Sidney and D'Alonzo, C.A.
1973 "A five-year mortality study of alcoholics." Journal of Occupational Medicine, Vol. 15, pp. 120-125.
- Perrine, M.W.
1975 "Alcohol involvement in highway crashes: A review of the epidemiologic evidence." Clinics in Plastic Surgery, Vol. 2, No. 1, January, pp. 11-34.
- Roizen, J.
1977 "Alcohol As an Excuse for Crime: A Re-Evaluation of the Deviance Disavowal Hypothesis." Berkeley, CA: Social Research Group Working Paper.
- Room, Robin
1971 "Survey vs. sales data for the U.S." Drinking and Drug Practices Surveyor No. 3 (January), pp. 15-16.
- Szalai, Alexander, ed.
1972 The Use of Time: Daily Activities of Urban and Suburban Populations in Twelve Countries. The Hague and Paris: Mouton.
- Waller, J.A.
1971 "Factors associated with police evaluation of drinking in fatal highway crashes." Journal of Safety Research, Vol. 3, No. 1, pp. 35-41.
- Wolfe, A.
1974 "U.S. National Roadside Breathtesting Survey." HIT Lab Reports, Vol. 4, No. 11, pp. 1-16.





CHAPTER TWO

ALCOHOL AND
HOME, INDUSTRIAL AND
RECREATIONAL ACCIDENTS

by

Deborah Wingard

Robin Room

TABLE OF CONTENTS

	<u>Page</u>
Introduction	41
A. The Incidence, Prevalence and Patterning of Accidents	44
B. Explanations of Alcohol Involvement	50
C. Empirical Research	51
1. Alcohol use at the time of the accident	51
2. Drinking history, drinking problems and accidents	51
3. Accident involvement of labelled alcoholics	62
D. Alcohol and Particular Types of Accidents	65
Industrial Accidents	65
Aviation Accidents	76
Drowning	80
Fire Accidents and Burns	87
Falls	93
Other Accidents	96
E. Conclusion	98
Bibliography	103
General Introduction and Multi-Casualty Studies	103
Industrial Accidents	109
Aviation Accidents	112
Drowning	114
Fire Accidents and Burns	116
Falls	118
Other Accidents	119

ALCOHOL AND
HOME, INDUSTRIAL AND
RECREATIONAL ACCIDENTS

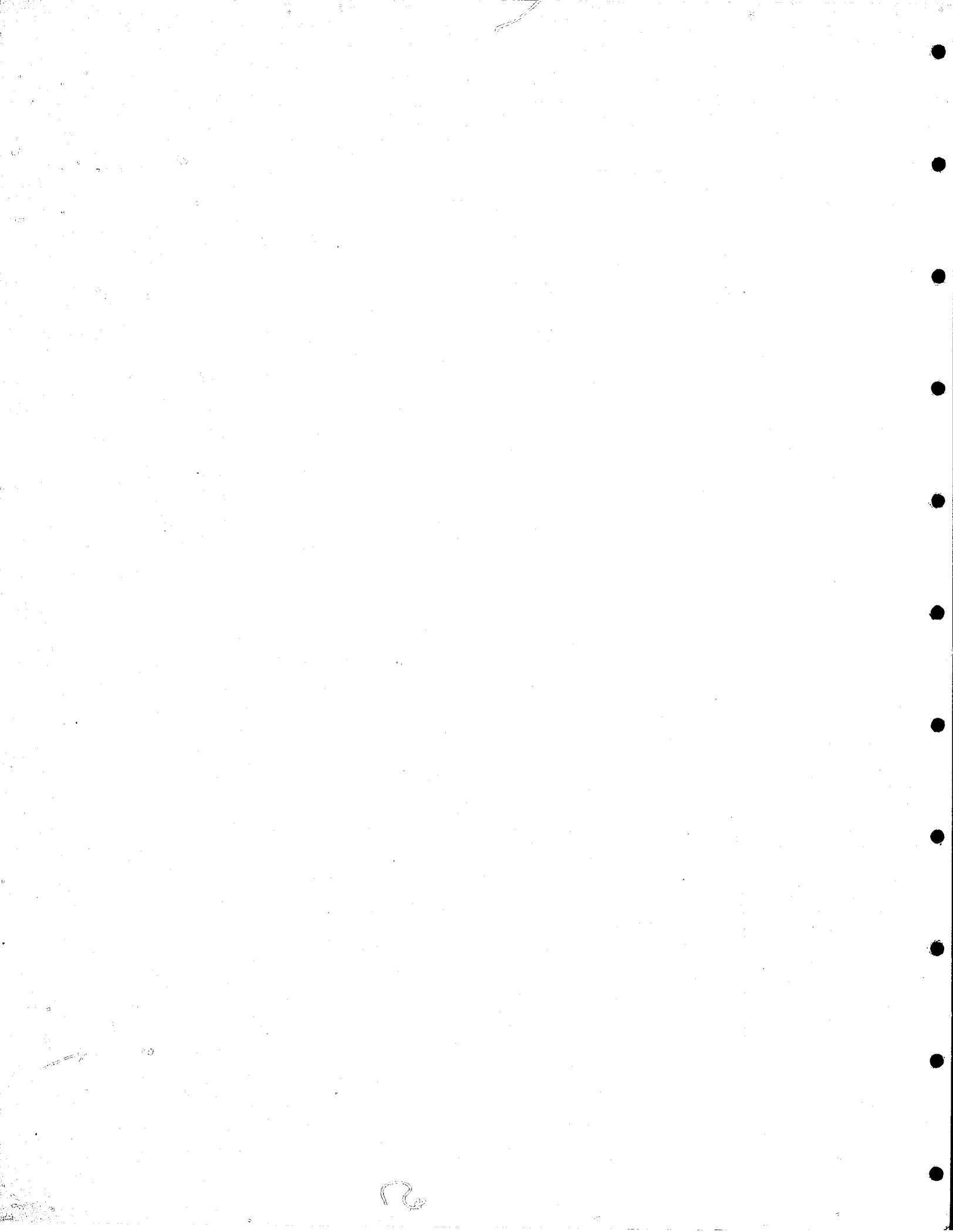
"How many fall down by the way,
Are killed in the dark.
And so their lives are swept away,
This often we may remark.

Liable to fall into the fire,
And there to burn to death.
Then suddenly they must expire,
To flame must yield their breath.

Seamen their spirits to inflame,
Scarce able for to steer.
So thousands perish in the main,
Large numbers every year.

Some almost perish with the cold,
And others freeze to death.
So many die before they're old,
So they lose their breath."

--from an anonymous poem, "The Danger of
Excessive Drinking," Boston, 1793, cited in
Levine, 1977.



The involvement of alcohol in accidents has long been recognized. It was a staple plot device of temperance novels: in these, as a student of nineteenth-century sentimental fiction has remarked, "deaths by freezing" took a "prominent place, for temperance novelists seem to have been fascinated by scenes in which the body, 'stiff as buckram', was chopped from the ice with a jug clutched firmly in the dead man's hand. Deaths by cremation ... also bulk large. How easy for a reeling mother to drop her babe in an open fireplace, or ... fall into the flames herself and be burned ... 'almost to a cinder'". The commentator goes on to note that "the variety of catastrophes is almost as amazing as their number", mentioning among other examples plots where "drunken captains ran their heavily freighted barks upon the rocks" and "intoxicated stagecoach drivers cascaded their passengers over steep embankments" (Brown, 1959, p. 223; cited in Levine, 1977). *

Despite the usefulness of accidents as a plot device in fiction, the temperance movement did not especially emphasize accidents as a consequence of drinking, preferring instead to stress crime, family disruption, pauperization, and ruination of health as major ill effects of alcohol (Levine, 1977). A minor exception, prefiguring the modern concern with alcohol and traffic accidents, was a fascination around the turn of the century with alcohol's role in train wrecks (Levine, 1977).

The rise of life insurance companies and the organization of public health services in the late nineteenth century was accompanied by an increased concern over the relation between drinking patterns and general mortality or longevity, but this concern did not particularly focus on alcohol's role in accidents. Thus when Phelps attempted to estimate the overall mortality from alcohol in the United

* The bibliography is divided into seven sections which correspond to major headings in the text -- Introduction and Multi-Casualty, Industrial Accidents, etc. (See Table of Contents). To locate references mentioned in the text, refer to the relevant bibliography. Some references may be listed in more than one bibliography if mentioned in more than one place in the text.

States by averaging estimates of alcohol's role in specific causes of death made by three experienced medical directors of life insurance companies, the mean proportions of accidental causes attributed to alcohol ranged only from 7% to 14% (Phelps, 1911; see Table A-2). In the alcohol literature of the day, the role of alcohol in accidents was mentioned without special attention; thus Norman Kerr, the Jellinek of his day, reports that in a study of 470 consecutive inquests of Londoners aged 16 or over, "alcoholic excess was proved in evidence to have been the direct cause of death" in 143 cases, of which 23 died from accidents, along with 21 suicides and 9 who choked when drunk (Kerr, 1894, pp. 480-481). With a few early exceptions (e.g. Boos, 1913; Brickley, 1915; Schumacher, 1923), the literature on alcohol's involvement in accidental deaths dates only from the last 30 years, and the U.S. literature on alcohol and accidental non-traffic injuries may be said to have not yet got under way.

The absence of a special emphasis on alcohol in accidents in the temperance era reflects the lack of any equivalent of modern concern and organization around safety issues in general. The nineteenth century was concerned about safety: the inventors of the day turned out an endless variety of improvements advertised in terms of their safety potential -- e.g., the safety match, the safety catch, the safety pin. But safety was viewed as an individual responsibility rather than a state or corporate concern. Gersuny (1976) has noted that "1907 marked the beginning of the safety movement in American industry." The National Safety Council was formed in 1913.

In recent years, building on the concerns of the early years of the century, there has been a substantial expansion of interest in the prevention of accidental death and injuries. At the federal level, this has been reflected in the proliferation of agencies concerned with safety and casualty prevention-- for instance, the Consumer Product Safety Commission, the Occupational Safety and Health Administration, the National Fire Prevention and Control Administration, the National Highway Traffic Safety Administration. Longstanding federal agencies such as the Coast Guard and the Bureau of Mines have been given new responsibilities for safety measures.

There is little doubt that the U.S. is now a safer society than it was 60 years ago. Despite the sevenfold increase in the motor-vehicle death rate between 1912 and 1975, the overall rate of accidental deaths declined in that period by 41 percent--from 82 to 48 per 100,000 population per year (National Safety Council, 1976, p. 10). By international standards, however, the U.S. is still accident-prone: among 24 European or industrialized countries, the U.S. ranks ninth highest in overall accident mortality, and even if motor vehicle fatalities are excluded still ranks tenth (calculated from National Safety Council, 1976, pp. 22, 71).

A. The Incidence, Prevalence and Patterning of Accidents

Injuries, accidental and otherwise, account for a substantial part of all mortality, illness, and impairment in the United States. The overall annual U.S. mortality in 1974 was 915 per 100,000; of this, "unnatural" mortality had a total rate of 72 per 100,000, divided between homicide deaths (10), suicide deaths (12), and accidents (50) (National Safety Council, 1976, p. 9). In terms of days per year per person of restricted activity due to illness or injury, a 1973 national survey showed that 2.1 days were accounted for by current injuries (as compared with 7.0 days for other acute conditions and 7.4 days for chronic conditions;

calculated from National Center for Health Statistics, 1974). In terms of chronic or permanent impairments of activity or senses, injuries account for an estimated 25% of all impairments (1971 overall rate of impairment: 253 per 1000 population; due to injuries 62/1000). The most frequent injury impairments were of the back, legs and hips. About 29% of all impairments due to injury caused some degree of limitation of activity (calculated from National Center for Health Statistics, 1973).

The estimates given above are for all injuries and death, including assaultive and suicidal events. Homicide and suicide will be discussed separately and in detail later; hence we will confine this discussion where possible to the residual classes of serious events, presumptively unintended, that are usually referred to as accidents.* As indicated by the mortality figures above, accidents account for a preponderance of all "unnatural" mortality, and no doubt of all injuries.

To a considerable extent the figures given above underestimate the social impact of accidents as a health problem. Our culture is especially concerned by early mortality or youthful impairment: it is particularly shocking to us when someone dies long "before their time". Accidents play an especially prominent role in death and disability in younger age groups. Thus accidents are the leading general cause of death for all ages from 1 to 38, accounting for 47% of all deaths aged 5-14, 51% of deaths aged 15-24, and 21% of deaths aged 25-44 (calculated from National Safety Council, 1976, p. 8). Young adults show the highest proportion of days of restricted activity due to illness

* Although property damage as well as death or injury is a concern in accidents, so little attention has been paid in the literature to alcohol's role in property damage that it is not considered here.

or injury as being due to injury (including intentional-- 12% for ages 0-16, 22% for 17-44, 19% for 45-64, 13% for 65+; calculated from National Center for Health Statistics, 1974).

Despite their relative prominence among the young, accidents are actually considerably more common among the elderly. The death rate for accidents in fact takes a W-form, with the highest peak in the oldest age group*, but a middle peak at ages 15-24. If motor-vehicle accidents are excluded, the middle peak is flattened out. The rate of days of restricted activity due to injury, on the other hand, rises fairly steadily with increasing age (National Center for Health Statistics, 1974). As might be expected from a partly cumulating indicator, the same pattern is true for impairments due to injury (calculated from National Center for Health Statistics, 1973, Tables 13 & 22).

Impairments due to injury and days of restricted activity due to injury are both more common among males than among females. At least for restricted activity days, the male surplus is confined to the age groups 6-44; older women have more restricted activity days than men. Men are 2½ times as likely to die in an accident as women. Although there appears to be a male surplus at all ages, it is particularly concentrated among young men: males aged 15-24 are over four times as likely as females aged 15-24 to die in an accident (National Safety Council, 1976, p. 9).

Injury is also associated with lower socioeconomic status, whether measured in terms of impairments**, days of restricted activity,** or mortality (National

* Death rate per 100,000 from accidents: under 1 year, 48; 1-4 years, 29; 5-14 years, 18; 15-24, 62; 25-44, 43; 45-64, 47; 65-74, 69; 75 and over, 191 (National Safety Council, 1976).

** Using education as the indicator of socioeconomic status, since it is less likely than income to be a result of the injury.

Center for Health Statistics, 1973, pp. 10-19; 1976, p. 24; 1975, p. 36). In comparisons in 19 selected cities, residents of poverty areas were uniformly more likely to die of injuries than residents of nonpoverty areas, and blacks were more likely to die than whites. Within poverty areas, the rates by race were more nearly equal (National Center for Health Statistics, 1975, p. 36).

Accident mortality also varies considerably by region of the country, with New England, Middle Atlantic and East North Central States generally showing lower rates, and Southern, mountain, and prairie states generally showing higher rates (National Safety Council, 1976, p. 19). The traditional regional strongholds of temperance sentiment in the U.S. (Cahalan & Room, 1974) thus tend to have higher rates of accident mortality.

An enormous diversity in the events is covered by the rubric of "accident". Even subclasses include a wild variety: drownings can be in a bathtub or a cesspool or an ocean; burns can be due to a kitchen stove or a house on fire or an airplane crash; falls include stumbling over a curb, falling down stairs, or going over a cliff.

Various kinds of order can be imposed on this diversity. Differentiations that have been in common use include a classification by the location and type of trauma in the victim's body; a classification by the agency of death or injury (gunshot wound, poisoning, drowning, burns, falls, etc.) and a classification by location or situation of occurrence (home, transportation, industry, public place). Often the literature mixes bases of classification together, and in discussing the role of alcohol in accidents we will follow the literature in discussing classes formed by location as well as by agency of injury.

Table A-1 shows the annual accident mortality and rate of injuries and the prevalence of impairments due to injury in the U.S. by the general location of the event and for selected external causes. It can be seen that motor

Table A-1

Mortality, Injury and Disability
By Class of Accident

	<u>Accident mortality rate per 1000</u>	<u>Estimated annual injury rate per 1000</u>	<u>Estimated rate of persons with impairments due to injury per 1000</u>
A. <u>By Location:</u>			
Motor Vehicle	.22	21	11
Work	.04	42	5
Home	.12	104	16
Other public location	.11	133	17
Total	.49	295	62
B. <u>By Selected External Causes:</u>			
Motor vehicle	.22	23	11
Falls	.08	67	12
Drowning	.04	--	--
Fires and burns	.03	5	2
Poisoning	.03	--	--
Aviation	.01	--	--
Firearms	.01	1	2

Notes: Injuries include assaults and suicidal acts. Work mortality excludes .02 motor vehicles at work. Location categories are mutually exclusive. Contact with hot object or substance included in burns for injury, apparently not for impairments or mortality.

Sources: Mortality: National Safety Council, 1976, pp. 6,7,12; Injury rates: by location, National Safety Council, 1976, p. 2; by cause, NCHS, 1976, Table 2. Impairment rates, NCHS, 1973, Tables 12, 13.

vehicles account for 45% of accidental deaths.* Since most motor vehicle accidents occur in public locations, it is evident that in terms of accident mortality the home is a relative sanctuary and the workplace even more so.

The motor vehicle bulks far less large in the overall rate of injuries and prevalence of impairments due to injury. Home and public places not involving automobiles are the prime locations for injury, and falls a major contributor to the injury rate. Other common sources of injury (not shown) are by bumping into a person or object, being struck by a moving object, injury by a cutting or piercing instrument, and twisting or stumbling. Motor coordination--which is considerably affected by drinking--is thus involved in many of the primary sources of injury. The same sources are fairly important causes of impairment due to injury, with injury by machinery in operation also making an important contribution. Impairments in general are likely to reflect a severity of event intermediate between those causing death and those causing injury, and this seems to be reflected in the patterning by location and external cause: motor vehicles and falls are both important but not predominating causes.

Worth noting in Table A-1 is the great difference in overall order and magnitude between rates for injuries and fatalities. It is reasonable to expect from this discrepancy that correlates and patterns of injury may differ from those of fatality: what is seen in the emergency room may well differ from what is seen by the coroner. It is true that the injury data in Table A-1 is based upon survey self-reports or reports by family members, and will include injuries which did not necessarily come to institutional notice. An estimate of the relationship between self-report and officially noted injury can be made from the National Safety Council's data on company notifications of work-related injury, which occurred at roughly one-quarter the rate of self-reported work injury. On the other hand, company-notified injury was about 180 times as common as work-related fatality.

* Motor vehicle accident mortality rate per 1000 (.22) = 45%
Total accident mortality rate per 1000 (.49)

Clearly Table A-1 illustrates that the motor vehicle is by far the most lethal instrument of modern society. It is thus not surprising that road accidents have acquired a separate and very extensive literature, which far outdistances in depth and sophistication the literature on other accidents. For the remainder of this chapter, then, we will concentrate on a discussion of other accidents, reserving for a separate chapter the role of alcohol in road accidents.

B. Explanations of Alcohol Involvement

Numerous theories have arisen to explain how alcohol may be involved in accidents. They fall into three categories: physiological, psychological and associational theories. While they are frequently mentioned in all of the accident literature (particularly the physiological theories), little research attempts to determine which, if any, explanation is involved in the events studied. Rather, research either addresses the physiological effects of alcohol use on man or the amount of alcohol use or abuse among specific casualty victims.

Research on short-term physiological effects has shown that alcohol use inhibits coordination and judgement, lengthens reaction time and decreases motor performance and sensory skill (e.g. industrial skills -- Wolkenberg, 1975; aviation skills -- Billings, 1973; MacFarland, 1953 and Newman, 1949). MacFarland and Newman have further shown that alcohol is more quickly absorbed at high altitudes. Since alcohol decreases oxidation in the cells, this could combine with the scarcity of oxygen at high altitudes to inhibit coordination and judgement in pilots of unpressurized planes. The "pseudo-warmth" effect of alcohol may encourage swimmers to remain in cold water too long, causing overexposure and subsequent drowning (Press, et al., 1968). Since a high proportion of alcohol use is found among choking victims, Zylman suggests that alcohol may adversely affect the swallowing and breathing reflexes, decreasing the drowning person's chances of survival (Zylman, 1976).

Some short-term psychological effects frequently mentioned, particularly for aviation accidents and drowning, include an increase in risk taking and daredevil stunts by those under the influence of alcohol. Accidental poisonings have been attributed to a lack of knowledge of the dangers of alcohol use, whether alone or with other drugs. The industrial literature suggests that alcohol users and abusers may actually avoid work when they are too drunk to perform safely. Therefore absenteeism and home accidents may be the primary outcomes of employees' drinking habits.

Finally, short and long-term associational theories suggest that alcohol is not directly involved in accidents but is frequently used in situations where there is a high risk of accidents or by persons who are for some other reason accident prone. For example, in the studies of alcoholics, their high rate of falls and fire accidents may be due to poor housing. People may be more likely to drink when fishing or at a swimming party. Alcohol may be frequently found among fire victims because drinking and smoking are often associated, and smoking increases one's chances of starting a fire.

Each of the above theories, and particularly the short-term physiological ones, are used to explain the possible effects of alcohol use in the event, while studies of alcoholics and heavy alcohol users emphasize long-term associational theories.

C. Empirical Research

1. Alcohol use at the time of the accident

While there are a number of follow-up studies of treated alcoholics which include data on their accident experience, the primary emphasis in studies of the relationship of drinking and accidents has been on alcohol in the event. Numerous studies in a variety of places and focussing on various classifications and specific categories of accidents have sought to establish

Table A-2

Percent Alcohol-Involved in Accidental Deaths: Coroners Studies

CASUALTY	First author, year	United States										Foreign					
		Phelps 1911*	Brickley 1915	Joss 1947	Gonzales 1948	Spain 1951	Fisher 1952	Wilentz 1953	Metro Life 1968	Waller 1972	Deasy 1973	Haberman 1974	Trunkay 1974	Hansen 1956	Bowden 1958	Cutler 1971	Alha 1974
Industry		8							0				9				
Aviation																	
Drowning		13				69	62	20	30					4	30	57	
"Home"								2	54								
Fire/Burns			60					25	64		30			12	41		
Falls							21	17	70		33			10	39		
Other accidents		14	34	24	75	38	28	32	42	18		41		45	36		
Traffic		7	60	46	52	20			51	37		32	14	26	22		
Assault			50												50		
Homicide		13	62	88	69	14-44	14		50	42			26	54	57		
Suicide		23		19		11-23			40	26		32	3	36	37		
Other Unnatural mortality/accidents			5				8		34					34			
		41	54	40	27	64	16-38	16	42	47	35	41	30	11	35	37	

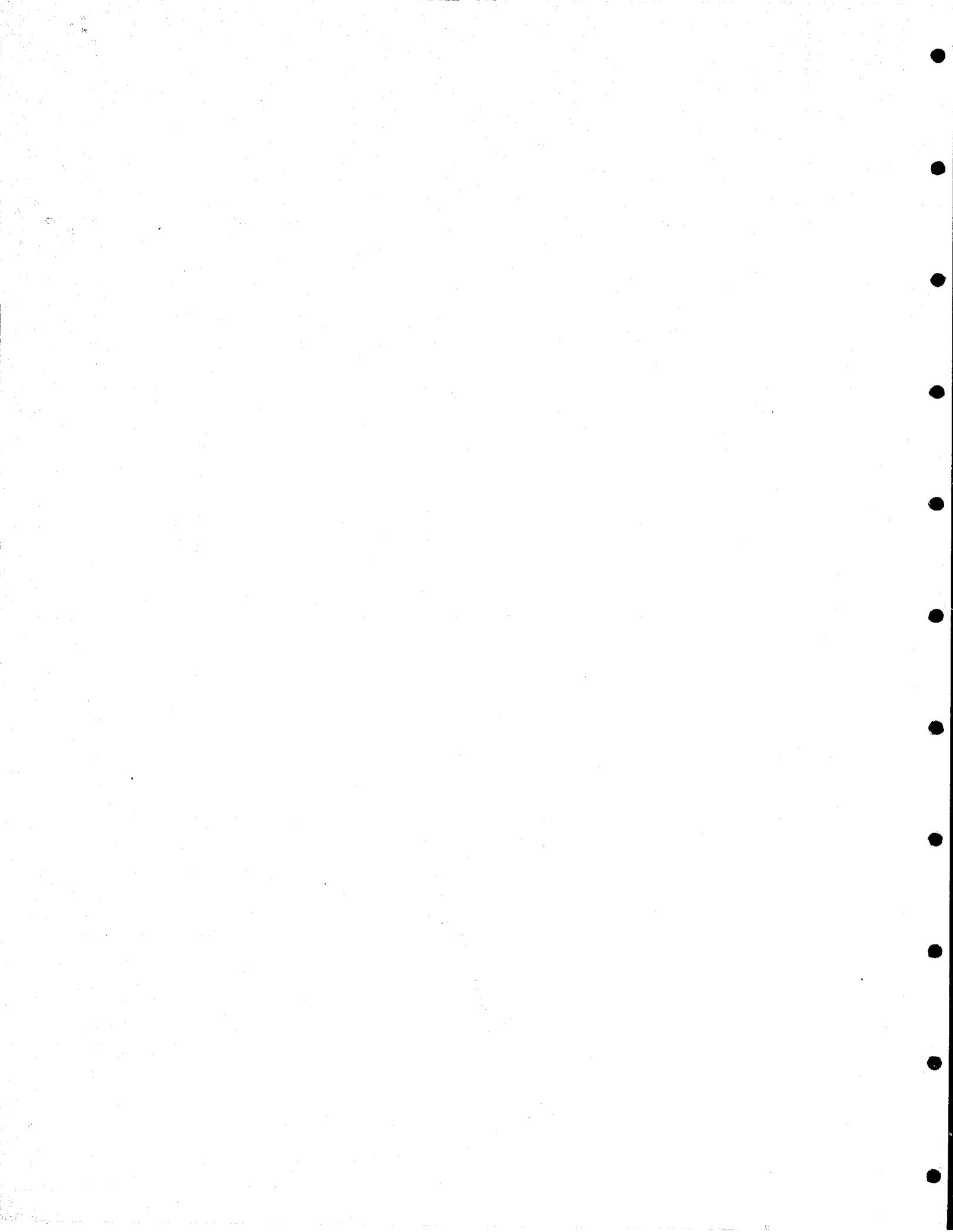
*Estimates by three life insurance physicians--not a coroner study.

See Table A-21 for detailed information on specific studies.

Table A-3
Percent Alcohol Involved in Accidental Injury: Emergency Room Studies

CASUALTY	First author, year	U.S.										Foreign						
		Kirpatrick 1967	Wechsler 1969	Schumacher 1923	Hindmarsh 1934	Besson 1953	Verhaege 1959	Mikheikin 1963	Johnsen 1966	Truchet 1966	Imobersteg 1967	Gay 1970	Kielholz 1973	Lahdenranta 1973	Bydberg 1973	Honkanen 1974	Honkanen 1976a	Honkanen 1976a (rural)
Industry		16					36			47	12	28	19				19	9
Aviation																		
Drowning																		
"Home"		45	22				52		81	17		27					36	40
Burns			18															
Falls			23														42	
Traffic			30		28		61		42	24	57	35					38	17
Assault			56	46			76			4-6			45				71	86
Suicide attempts											42						64	
Other			22										6				46	29
All accidents		24	1	32	32	47	16	30	58	18	34	31	8	21	40	37	30	

See Table A-22 for detailed information on specific studies.



the proportion of accident events in which the victim has been drinking. The studies have primarily been oriented around one of two major sampling frames: mortality, as viewed by the coroner or medical examiner who must certify as to the cause of death; and injury, as seen in a hospital emergency room or other emergency medical service.

Tables A-2 and A-3 summarize the results of a number of studies which have dealt with accidents in general, rather than confining themselves to a particular type of casualty. These tables should be examined in conjunction with Chart I which gives an overview of numbers of studies and ranges of findings for mortality and injury studies in the major classes of accidents covered by the literature on alcohol's role in accidents. It is notable that in the area of alcohol and accidents, American research plays a large role in coroners' studies but a small role in emergency room studies. The organization of the health system in the U.S. appears not to have encouraged emergency room research with epidemiological interests: when special societal interests in the epidemiology of accidents have arisen in recent years, it has been necessary to set up special reporting systems to collect the desired data from emergency rooms. A specific interest in the role of alcohol in accidents might well be incorporated into such systems as the Consumer Product Safety Commission system and the Drug Abuse Warning Network.

Patterns of findings for the individual types of accidents will be discussed separately later; we will here briefly note some patterns. Overall, drowning and fires seem to show relatively high rates of alcohol in the event, and industrial accidents to show relatively low rates. There is some tendency for fatal accidents to show a higher alcohol involvement than injuries. For casualty areas where there are more than a couple of studies, the range of variation is very wide.

While some of the variation, no doubt, reflects cultural differences, some is due to variations and problems in the methodology of the studies. For example, in these studies the nature of the event is usually determined by a combination of the physical evidence in the victim's body and statements from witnesses or the victim; without such statements, a fall cannot always be distinguished from an object falling on the victim, or for that matter from an assault, and a home accident cannot be distinguished from a work or public-place accident. The existence and extent of the victim's drinking in the situation is usually measured by blood, urine, or breath alcohol content (all will be referred to here as BAC). Very few coroner's or emergency-room studies measure the drinking history of the victim, although general drinking patterns can be correlated with accident data in some general population data (see below).

Each of the factors in the design of the conventional study of alcohol and accidents offers potential for biased or misleading results. Depending on the jurisdiction, coroners may not see cases which were under a private physician's care, so that a sample drawn from coroner's cases may underrepresent the relatively well-off. Hospital emergency rooms draw a mixed bag of severe accident cases and persons who have no other ready source of medical help even for minor problems. Persons who are drunk may be either more or less likely to appear. The particular "window" which frames the sample, then, will influence the results in unknown ways.

The definition of the nature of the event may pose fewer problems, particularly for mortality: a death is relatively unambiguous, and such categories as drowning or burns are also fairly determinate. However, the determination between accident, homicide and suicide is often difficult, and

the location or external cause of death is often unknown to the coroner. Drinking-involved events may be less likely to have witnesses to help untangle these issues: a high proportion of the alcohol-involved drownings studied by Giertsen (1970) were unwitnessed, and Press et al. (1968) show more missing information, e.g. on type of swimmer, where alcohol was involved in the event. With injuries the dimension of severity adds to the variation: one person's scratch is another's wound, and persons who are drunk and slightly injured may be less likely to come to an emergency room, or conversely may be more likely than others to be brought there by the police or friends.

Difficulties in the measurement of drinking often result in severe problems of sample selection and validity. Measurements by emergency-room observation of unsteady gait, etc., have long been known to be unreliable, missing many cases who have been drinking heavily and falsely including others such as persons in a diabetic coma (Jetter, 1938). Measurement by questioning of the victim or witnesses or friends may result in either over or undercounting, depending on the incentives in the situation, and in some cases will not be possible. Measurements by BAC give an air of scientific exactitude that is often spurious. While there may be problems of reliability in BAC measurement, the major issues are selectivity and timing. In life-threatening situations, getting a BAC will not be high on the emergency room physician's priorities. In coroner's studies, BACs are often performed only on cases where it is suspected alcohol is present, thus inflating the findings of alcohol involvement, to the extent that the coroner guesses correctly. The proportion of cases on which a BAC was collected is thus an important -- and sometimes unreported -- condition on a study's findings.

Even where the investigator does not allow these issues of biased sampling to obtrude, he or she cannot control what happens outside the door of the clinic or morgue. There is often a considerable period between the event and the victim's appearance at that door: indeed, victims of aviation crashes or drowning may not be found for days. When the body putrefies, an alcohol-like substance is formed and will invalidate the BAC measurement. Experts apparently disagree on the validity of BAC measurements in charred bodies. When the victim is alive or lives for a period beyond the event, alcohol will metabolize and be lost to measurement in the intervening time. Conversely, the victim may have had one or more drinks in the period after the event -- if only to "calm his nerves" or "ease the pain". These factors, which are often not discussed or measured in BAC accident studies, can have a very substantial influence on findings, as shown by Wechler et al. (1969). (See Table A-4).

For all classes of accidents, positive BACs among those who entered the emergency service seven or more hours after the accident were less than half as prevalent as among those entering within three hours. Conversely, positive BACs among those who had had a drink after the accident were substantially elevated.

Even more serious than the problems of sampling bias and data validity is the problem of interpretation of the results of the conventional coroner's or emergency-room study. Studies frequently report the BAC or other drinking measure only in dichotomous form (e.g. "BAC positive", or $BAC \geq .10$), raising the possibility that even where comparison with a control group is available, it will be misleading, since a dichotomous comparison may conceal very different distributions of drinking quantity.

Table A-4: Percentage of patients with positive Breathalyzer readings, by reason for admission, controlled for drinking chronology and delay of treatment

Reason For Admission	Group 1, with drink after episode (N=600)	Group 2, with no drink after episode, who entered emergency ser- vice in		
		less than 3 hours (N=2,418)	3-6 hours (N=699)	7 or more hours (N=1,531)
TOTAL	38.2	19.4	11.0	7.8
Accidents	43.5	21.6	18.2	10.1
Home	40.0	26.9	17.4	10.0
Transportation	47.4	31.8	32.4	0
Occupation	46.6	11.8	14.3	11.9
Other	43.0	27.3	15.8	10.9
Nonaccidents	28.2	8.0	6.0	5.8
Fights or assaults	71.4	63.7	41.7	14.2

Note: Information on 1 or both variables not available for 374 patients.

Source: Wechsler et al., 1969, p. 1047

Finding that a high proportion of accidents involve alcohol does not have much meaning or implication for action if we do not know what proportion had been drinking at the same level among those similarly situated but without an accident. Drinking patterns in our society are quite highly specific -- males drink more than females, younger adults drink more on an

occasion than older adults, styles of drinking vary by social class and ethnoreligious group. Drinking is predominantly a leisure-time activity in the United States, and a frequent accompaniment to specific activities, such as partying, watching football on television, or boating. Drinking, and particularly heavy drinking, is more common in the evening than in the morning, more common on Friday and Saturday evening than at other time. Heavy drinkers and heavy drinking situations vary from others also on many non-drinking characteristics. Most importantly, norms of behavior while drinking vary considerably between different social groups and situations: an equal amount of alcohol may make people in one situation quiet and in another reckless.

As noted above, different kinds of accidents also occur in quite specific circumstances and to different classes of people. Overall, accidents are predominantly a male phenomenon. Patterns by age vary by class of accident. Drownings are more frequent in summer, fires in winter. Occupational accidents as conventionally defined can happen only to those who are employed. These and many other factors may covary and contrast with patterns and locations of drinking. Data from Wechsler et al. (1969; Table A-5) shows that the net effect of demographic variations in accident events and in drinking can be substantial: the proportion of alcohol found in the event varies for most classes of event by each of the four demographic characteristics measured.

The conventional answer to the problem of interpretation of the result has been the comparison group. Frequently such comparison groups have been ad-hoc and unsatisfactory, such as Wechsler et al.'s comparison group of non-accident hospital patients. Such a comparison group may be worse than none at all, if it yields misleading results: we may suspect that people who are getting sick are unlikely to feel like drinking.

A more expensive and rigorous answer is the matched control group, matching both for demographic characteristics of the victim and for the event's

Table A-5: Percentage of patients with positive Breathalyzer readings, by reason for admission, controlled by patient characteristics.

Patient characteristics:	Home accidents		Transportation accidents		Occupation accidents		Other accidents		Fights or assaults		Non-accidents	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Sex:												
Men	267	31.5	239	37.7	825	10.5	430	34.9	163	58.3	1,277	10.7
Women	353	15.3	165	17.6	144	10.4	378	11.9	25	44.0	1,356	7.0
Age group (years):												
16-25	177	19.2	203	27.6	298	9.7	335	21.2	78	48.7	603	7.2
26-45	199	25.1	120	35.0	416	19.2	206	32.5	74	66.2	724	12.0
45-65	134	23.9	61	32.8	237	16.5	175	26.3	30	60.0	711	10.6
Over 65	110	20.0	20	5.0	18	16.7	91	12.1	6	16.7	501	4.7
Marital Status:												
Single	218	24.8	220	25.4	309	10.7	427	24.8	119	55.5	810	8.2
Married	286	19.2	145	33.1	591	17.8	252	23.8	52	53.8	1,267	9.3
Widowed, divorced, or separated	113	25.7	36	41.7	67	19.4	125	23.2	17	70.6	533	9.0
Social Class: ¹												
I and II	82	13.4	62	29.0	36	0	125	21.6	18	61.1	236	6.7
III	97	21.6	68	29.4	82	13.4	145	20.0	24	58.3	272	12.5
IV	193	20.7	157	29.3	486	15.8	257	27.6	68	50.0	783	7.4
V	203	26.1	88	30.7	337	17.2	213	22.5	62	61.3	1,109	9.4

¹Hollingshead "Two-Factor Index of Social Position," 1957.

Classes I and II are high and Class V is low.

Note: Number = total cases with available information

Source: Wechsler et al., 1969, p. 1048

situation (location, time of day and week). While this model is often discussed in studies of alcohol and accidents, having been perfected and routinized in studies of motor vehicle accidents, it has rarely been applied to other accidents. A recent study by Honkanen et al., (1976b) applied the method to a study of pedestrian accidents, primarily consisting of falls in public places. This method is indeed a great improvement on the uncontrolled single-figure study but it always leaves open the possibility that other factors besides these

controlled for affect the relation between alcohol and the accident. Furthermore, as the definitions of type and situation of the accident are drawn more tightly, the method becomes increasingly untenable: the researcher may end up looking for matched controls in a particular neighborhood who are on a rickety ladder in a high wind, that is, in a situation no sober person in his right mind would find himself. The assumption of happenstance in the event on which the matched control method depends begins to break down.

2. Drinking history, drinking problems and accidents

An approach which escapes these problems is the general-population study, allowing for multivariate analysis of possible factors in the accident. However, accidents are rare enough events to require a very large sample for detailed analysis: thus the National Health Survey annually interviews 40,000 respondents, yet analyses of correlates of injuries in this data quickly run out of cases. Conventional survey studies, with sample sizes of at most 2000-3000, are forced into a general categorization of accidents and often into measuring a general accident-proneness dimension rather than specific events. Thus Suchman (1970), using a sample of 1067 Pittsburgh high school students, reports the distribution by drinking patterns of students reporting two or more "accidental-injuries (in the last year) that either bothered you for at least seven days or interfered for that long with things you usually do":

Table A-6: Percentage of High School Students Reporting Accidents by Drinking Status.

	<u>% with 2 + accidents</u>	<u>Sample N</u>
"regular" drinkers	36%	(44)
"occasional" drinkers	14%	(315)
non-drinkers	3%	(708)

Source: Suchman, 1970

Using the same question in a telephone follow-up of a nationwide survey of 2746 adults, but focussing on single-injury events, Brenner et al. (1966), found for each of three classes of accidents a modestly increased experience of accidents among the heaviest drinking category, when the observed number of accidents were compared to the expected number based on the sample age-sex specific rates:

Table A-7

OBSERVED/EXPECTED RATE OF ACCIDENTS FOR: VARIOUS DRINKING CATEGORIES

<u>QFV Category:</u>	Accidents				
	<u>Accidents Involving Motor vehicle</u>	<u>Accidents Involving Loss of Balance</u>	<u>Other Accidents</u>	<u>Total Accidents</u>	<u>Weighted Person-Yrs.</u>
Heavy drinker	1.5	1.5	1.3	1.3	(502)
Moderate drinker	0.6	0.8	0.7	0.7	(694)
Light drinker	1.1	1.1	1.0	1.0	(1414)
Infrequent drinker	1.1	0.9	0.7	0.8	(746)
Abstainer	0.9	0.9	1.2	1.1	(1602)
Actual N of accidents:	(54)	(161)	(220)	(435)	

Notes: adapted from Brenner, Cisin and Newcomb (1966). Weighted person-years shown here rounded -- actual numbers in each cell about half the weighted number shown. Quantity-Frequency-Variability of drinking measure as defined in Cisin, Cahalan and Crossley (1969, pp. 11-16). Observed/expected rate of accidents: expected is computed from the sample age-sex specific rates.

In this study, the association between heavy drinking and accidents was similar in each sex, and appeared stronger in those with poorer health, lower education, lower income, in unskilled or semi-skilled jobs, and with indicators of depression and worry.

A third source of information of this type is previously unpublished data from a nationwide study of drug use among 2510 men aged 20-30. (O'Donnell et al., 1976). The respondents were asked whether they had ever experienced

health or injury problems due to their use of drugs, including alcohol, and those who experienced such problems from drinking were then asked the nature of the most serious such problem. In the total sample, 5.8% reported injuries as their most serious alcohol-related health problem. Among the 933 heavier drinkers in the sample, this proportion rose to 10.3%. Alcohol-related injuries were slightly more likely to be reported by those with lower education.

These studies converge in showing an association of relatively heavy drinking and the occurrence of accidents. However they offer little enlightenment on the nature or directness of the connection: it remains quite plausible that the relationship would be explained by a third variable, or that drinking forms part of a culture complex which is the mechanism of association. In fact, one of the studies argues for viewing both accidents and high school drinking under a general rubric of deviant behavior (Suchman, 1970).

3. Accident involvement of labelled alcoholics

Other than coroner's and emergency-room studies, the major source of empirical data on the role of alcohol in accidents is follow-up studies of samples of identified alcoholics or problem drinkers to determine their rate of accidental death. There appear to be no such studies covering accidental injuries. The findings of these studies are frequently reported in a relative risk format: the rate of death of the problem drinker or alcoholic is compared to the rate of death of some age and sex matched control group or general population (Table A-8). In most of these studies and for most types of accidents the alcoholic group shows a considerably elevated mortality, although there is a wide range of relative risk estimates.

Table A - 8
Relative Risk of Accidental Death: Alcoholics/General Population

CASUALTY	First author, year	United States				Foreign							
		Menge 1950	Davies 1965	Brenner 1967	Pell 1973	Dahlgren 1951	Sundby 1967	Gillis 1969	Eggeset 1970	Giffen 1971	Schmidt 1972	Nicholls 1974	Medhus 1975
Industry													
Aviation													
Drowning						3.8							
"Home"													70.0
Fire/Burns										9.7			
Falls			16.3							5.6	8.8		
Other accidents		3.2	5.7	2.0	2.5	2.8	17.1		2.5	3.5	11.1		
Traffic			5.0	4.5						1.4			
Assault										2.0			
Homicide			4.4							4.2			
Suicide		4.0	2.7	3.5	2.0	3.6	5.8	8.9	1.0	6.1	24.9	30.0	
Other Unnatural mortality/accidents			2.9										
			3.6	5.8	4.0	3.1			20	3.8	15.8	49.0	

See Table A-2; for detailed information on specific studies.

Table A - 9

Percent of Accidental Death Among Alcoholics, By Casualty

CASUALTY	First author, year	United States				Foreign								
		Devise 1965	Brenner 1967	Pell 1973	Schuckit 1974	Choi 1975	Dahlgren 1951	Nyrvig 1956	Eggeset 1970	Schmidt 1972	Dijk 1973	Nicholls 1974	de Lint 1975	Medhus 1975
Industry														
Aviation														
Drowning							0.3			0.5	0.4			
"Home"														
Fire/Burns									0.2		0.2		1.2	
Falls			1.0						0.3		0.6		3.6	
Other accidents			0.8	0.2			0.6	0.4	0.4		2.2	3.2	2.4	
Traffic		0.3	0.7		0.3				0.2		0.2		1.2	
Assault								0.4						
Homicide		0.3				1.3			0.5				1.2	
Suicide		0.1	0.7	0.2	0.3	0.2	0.6	6.8	0.8	0.5	4.9	1.9	4.8	
Other Unnatural mortality		0.3	0.4		0.1	0.9					0.4	2.6		
		1.1	3.3	4.0		2.4	1.5	8.6	6.0	2.1	1.4	9.1	7.8	14.4

See Table A-23 for detailed information on specific studies.

Several cautions should be born in mind in examining this data. In the first place, a relative-risk statistic gives no indication of the absolute probability of dying of a specific cause. The alcoholic group can show a substantially elevated mortality for a particular cause of death and yet be very unlikely to die of it. Table A-9 shows, for the studies where the data was available, what proportion of the alcoholic sample died of each cause. In follow-up periods ranging from about 3 to 37 years, only one study (the smallest, of 83 cases) showed more than 5% of the alcoholic sample dying of all types of accidents taken together (Medhus, 1975).

The relatively small proportions of the samples dying of accidents means that many of the relative-risk computations for specific types of accidents depend on very small numbers. Only the studies by Menge, Dahlgren, Schmidt and de Lint, and Nicholls et al., had a total of at least 50 accident fatalities.

The validity of the relative-risk comparison of course depends also on the choice of comparison population. Most of the studies refer to age-sex standardized mortality in the country or state from which the alcoholic population is drawn. But it is doubtful that any institutionally defined population would be evenly drawn from such an area: a clinic in a particular town will tend to draw particularly from the population of that town. Controlling only for age and sex assumes that in all other respects the alcoholic sample is evenly drawn from the general population.

Related to this is the substantial problem of the very special nature of labelled and particularly institutionalized samples (see discussion in NIAAA, 1974, pp. 81-83). It cannot be assumed and is in fact unlikely that the clinical alcoholic's excess mortality is accounted for by his alcoholism.

"Excess morbidity and mortality seen in alcoholics may be due not only to the effects of alcohol itself, but also to certain behavioral and personal characteristics that are more common in alcoholics than nonalcoholics, such as cigarette smoking, use of other drugs, poor dietary habits (leading to nutritional deficiencies), emotional disturbances, and physiological abnormalities that contribute to the development of alcoholism, and, concomitantly to other diseases as well."

(Pell and D'Alonzo, 1973 p. 125)

Against this it must be noted that an American study of the military found that alcoholics suffer early death even when food, shelter and medical care are available (Schuckit and Gunderson 1974).

The substantially elevated risk of accidental mortality among samples of alcoholics, then, cannot be taken as an indicator of a causal role for alcohol or even for alcoholism in accidental death. It is best regarded as indicating potentially profitable directions for further work.

D. Alcohol and Particular Types of Accidents

In this section we give detailed consideration to the literature on alcohol's role in five specific types of accidents where there is a substantial literature, and make brief reference to the few equivalent studies covering other types of accidents.

Industrial Accidents

The National Safety Council reports that industrial death and injury rates in the United States have been declining steadily since the mid 1930s. Still, in 1975 there were 12,600 on-the-job industrial deaths (3,900 involving motor vehicles) and 2,200,000 injuries (100,000 involving motor vehicles; National Safety Council, 1976). Unions estimate there were actually 18,000 deaths and 10,000,000 injuries (Morris Davis, personal communication). By either estimate, accidents on the job still affect a substantial portion of the population.

Despite the large scientific and insurance literatures on job safety, relatively little attention has been paid in recent years to the involvement of alcohol in industrial accidents. In the Progressive era, at the beginning of the twentieth century, some empirical work was undertaken both in the U.S. and Europe, under the impetus of the temperance and safety movements and of the introduction of workmen's compensation laws. The results were somewhat equivocal:

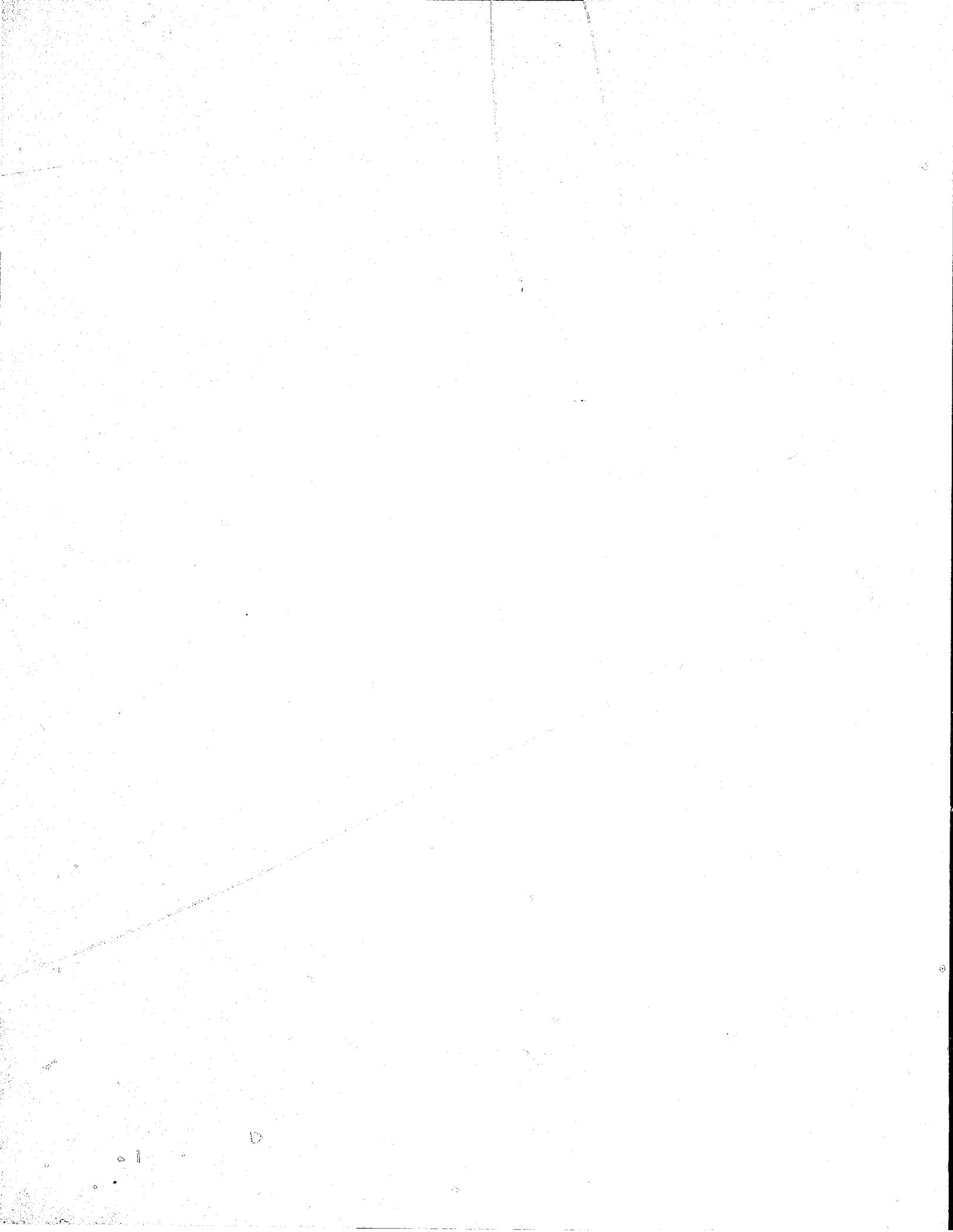
Although most safety experts came to believe that alcohol was an important cause of industrial accidents, they were unable to say exactly what part it played. It was relatively easy to determine whether a worker had fallen, been struck by a flying object, or been run down by a car, but it was almost impossible, they found, to ascertain whether alcohol was responsible for his failure to avert these dangers. (Timberlake, 1963, p. 71)

Nevertheless, it was believed that alcohol played a substantial role in industrial accidents; a resolution at the 1914 annual meeting of the National Safety Council declared that "the drinking of alcoholic stimulants is productive of a heavy percentage of accidents and of disease affecting the safety and efficiency of working men" (Timberlake, 1963, p. 71).

Modern interest in the topic dates from some estimates made by Jellinek (1947). His emphasis was on industrial accidents among alcoholics, rather than on the relation of accidents with alcohol consumption. Jellinek's estimates proposed that alcoholics had twice the fatal accident rate of other industrial workers. Jellinek's work initiated a tradition of studies emphasizing the impact of alcoholism on industrial safety and efficiency.

These studies soon went beyond the narrow definition of industrial accidents to include various other production losses due to alcohol abuse as being their main subject of interest. Some researchers included all fatal accidents among alcoholics as being a problem for industry. Other researchers stressed that absenteeism was a larger problem among alcoholic employees than accidents, resulting in a "\$2 billion hangover" of lost production for American industry. Virtually no research or studies were done on BAC levels of industrial accident victims in the United States, though some such studies were done in Sweden and France.

In the 1950s, controversy arose in the American literature over the issue of whether problem drinkers did indeed have higher on-the-job accident involvement than the normal population. Harrison Trice has been a strong proponent of the view that absenteeism rather than industrial accidents is the main consequence of alcoholism to American industry. His initial study (1957) was based on interviews with 163 alcoholics, primarily AA members, who recounted their work histories. The "overwhelming majority" reported they never had a work accident at all. Trice's subjects had a number of explanations for this: that in many jobs there is little exposure to danger, that many jobs were so routine they could be safely done even when intoxicated, that problem drinkers were overcautious on the job, getting less done but minimizing chances for accident. Furthermore, Trice found that when the problem drinkers had been so incapacitated that they would have had a high risk of getting into an accident, they tended to stay home rather than go to work. These factors seemed to keep the accident rate among problem drinkers low, though it did not protect them from having a high fatality rate from non-industrial accidents, specifically traffic crashes.



CONTINUED

1 OF 9

This analysis, based only on self-reports of alcoholics, was partially supported by Observer and Maxwell in a 1959 study. They interviewed 48 people labelled as problem drinkers in a factory and found they had a higher accident rate than a matched control group. They did find, however, that the higher accident rate was only true for problem drinkers under the age of 40; those over that age had the same accident rate as the control group. They suggest that the protective factors Trice mentioned were operative for the older drinkers who had conditioned themselves to their drinking and learned how it affected them, but younger drinkers still had not adjusted to the increased risk their drinking produced on the job.

In later studies of 86 and 552 A.A. members, Trice (1962) replicated his earlier findings: 18 and 21 per cent of those who said they were exposed to accidents on the job reported at least one "lost-time accident." These figures "fall about half way between the high and low extremes for various types of industries" in the population at large (p. 505). Among those exposed, rates did not vary by status of the occupation, by job freedom, by use of automobile on the job, or by off-job drinking experiences. In other studies, Trice found that supervisor's fears that an employee "was a safety risk" ranked relatively low as a reason for referring employees as alcoholics (Trice, 1965 a, 1965b). In a study comparing the accident records of diagnosed alcoholics with "normal" employees for the five years before diagnosis, Trice (1965a) found that 9% of the alcoholics and 6% of the "normals" had one or more lost-time accidents during the 5-year period prior to formal diagnosis. For all accidents, whether or not time was lost, both groups showed a prevalence of 14%. Ratings by personnel men of the accident exposure of different job categories suggested that alcoholics were substantially concentrated in the "occasionally exposed," though not in the "frequent exposure" category. Indirect evidence about off-job accidents, from a check of all medical diagnosis for the 8 years preceding

diagnosis, showed that alcoholic employees were significantly more often treated for "contusions."

The preoccupation in the American literature with the impact of the alcoholic or problem drinker on industrial safety and production has resulted in a lack of theoretical interest in or empirical information on the direct association of drinking and industrial accidents. Experimental evidence has shown that alcohol use inhibits coordination and judgment, lengthens reaction time, and decreases motor performance and sensory skill in simulated industrial work, as in other task performance. Wolkenberg (1975) conducted an innovative experiment in which he tested the delayed effects of intoxication on normal subjects. He put his subjects through a variety of tasks that tested coordination skills representative of those encountered in an industrial working situation before, during, and after they had consumed enough alcohol to raise their BACs to .15%. The last series of tests were administered the next afternoon, some hours after their BACs had returned to 0%. The experiments demonstrated changes in performance up to 18 hours after the ingestion of the alcohol, which could, in the opinion of the investigator, create health and safety problems in a work situation. Conversely, Laheima (1973) suggests that the stress and monotony of a job may drive a worker to drink, which in turn may lead to accidents.

On the other hand, Trice's alcoholics reported being able to neutralize or even benefit from the effects of alcohol in their work: They "felt that they had built up a routine for managing the effects of alcohol -- that they had learned what to expect from it.... A substantial number of interviewees insisted that they had fewer accidents than would be expected because they often drank during working hours in order to steady themselves. Drinking moderately during the working day, according to this description, temporarily calmed their hangover symptoms and allowed them to concentrate attention on the job" (Trice, 1962, p. 506).

About 18 studies, only one from the United States, have determined rates of alcohol use near the time of the accident (Table A-10). Two of these found alcohol present in 9 and 40% of fatal industrial accidents. The other 14 found alcohol present in 7 to 47% of non-fatal industrial accidents. The United States study found alcohol present in 16% of non-fatal industrial accident victims reporting to a hospital emergency room (Wechsler, et al., 1969). The rest of these studies are from various European countries and Australia and are therefore very difficult to compare, as each country has different drinking habits, working conditions, and safety standards. These studies also include different types of industries, which likewise have different working conditions and safety standards, and their workers have different drinking habits (Hitz, 1973).

To know if alcohol use is indeed related to industrial accidents the percent of alcohol use among non-injured employees is needed. If their rate is higher than those with injuries, alcohol might be considered protective. If their rate is the same, alcohol may have no effect. But if their rate is indeed lower, as expected, then an association would be shown between alcohol use and accidents. Only one study determined BAC levels for both accident victims and fellow workers. In this study, conducted in France, 30% of the former and 23% of the latter had BACs ≥ 0.5 (Ledermann & Metz, 1960). Thus at least in France, drinking on the job does not appear to be highly associated with accidents. Of course, even an established association would not show a causal connection; for instance, accident-prone workers or workers under stress might drink to calm down, so that their high accident rate might be due to the stress rather than the alcohol.

Table A - 10
Empirical Studies--Accidents
Industrial

Author, date, location	No. studied/ eligible	% alcohol present	Alcohol measure	Sex	Restrictions Age	Time	Other	Years of collection
<u>Fatalities: Foreign</u>								
Hansen and Jetzsch, 1956 Germany	215/--	9 BAC _{>.05}	BACs unknown no.	--	--	--	--	--
Naeve et al., 1973 Hamburg, Germany	230/672	40 BAC _{>.05}	BACs all cases	--	--	--	--	--
<u>Non-fatalities: United States</u>								
*Wechsler et al., 1969 Boston, Mass.	969/--	16 BAC _{>.01}	BACs on 82%; interviews on all	MF	over 16	--	alive on arrival	1966-1967
<u>Non-fatalities: Foreign</u>								
German studies, 1890s Germany	--/--	7	--	--	--	--	--	--
Guttstaat, 1907 Prussia	--/--	accident rates: 43/1000 all trades 109/1000 brewery	--	--	--	--	--	1897-1901
Ledermann, 1956 France	--/--	20	unspecified	--	--	--	--	--
Naeve, 1959 Germany	--/--	7	unspecified	--	--	--	--	--
*Verhaege and Schodet, 1959 France	--/--	36 pos BAC	BACs all cases	MF	adults	--	--	1956-1957
Ledermann and Metz, 1960 France	207/231	30 BAC _{>.05} 23 BAC _{>.05} (fellow workers)	BACs all cases	--	--	morning	--	--
Metz and Marcoux, 1960 France	4089/-- (1009 accidents)	2+ accidents= higher BAC	BACs all cases	--	--	--	--	--
*Truchet et al., 1966 France	--/--	47 pos BAC	BACs unknown no.	MF	adults	--	--	1957--
*ImObersteg & Bäumlér, 1967 Sweden	--/--	12 pos BAC	BACs unknown no.	MF	--	--	--	1965-1966
*Gay et al., 1970 Melbourne, Australia	18/--	28 BAC _{>.01}	BACs all cases	MF	18-65	--	alive on arrival	1965(?)
*Kiehlholtz et al., 1973 Switzerland	--/--	19 pos BAC	BACs unknown no.	MF	--	--	--	1964-1970
Lahelma, 1973 ^b Finland	337/1006	16 pos BAC	BACs all cases	--	--	--	--	1965-1969
Lahelma, 1974 Finland	51/--	23 major 57 possible 20 no influence	BACs all cases	--	--	--	--	1965-1969
*Honkanen and Visuri, 1976 ^c Helsinki, Finland	258/--	19 pos BAC	BACs all cases	MF	over 14	4 days	natives	1972-1973
*Honkanen & Ottelin, 1976 ^a Rural Finland	69/--	9 pos BAC	BACs all cases	MF	--	12 hrs	consecu- tive	Mar-Apr 1974

*Coroner and emergency room studies which cover more than this casualty. See Tables A-2 and A-3 for other casualties.

An interesting aggregate level study of the role of alcohol in industrial accidents was reported by Vernon in 1918, based on British experience in the First World War (discussed in Collis, 1922). Vernon studied the occurrence of accidents during the three spells of work on a night shift. As wartime alcohol restrictions decreased the opportunity for drinking before starting work, the surplus of accidents in the first spell and among men was considerably diminished; also accidents were more evenly spread throughout the days of the week, rather than increasing on the days after payday. Although it is possible that other wartime changes were having an effect, the study offers an interesting method for making a direct estimate of the effect of removing alcohol from the environment of the workplace, and offers statistical evidence on the frequently hypothesized effect of drinking outside the workplace on industrial accidents.

It is notable that there are few empirical studies from the U.S. on the relation between drinking and industrial accidents, and that what data there is suggests a lower incidence of alcohol use in industrial accidents than in other accidents, a finding also observed in many foreign studies (Tables A-2, A-3, A-5). Drinking on the job is in fact not a widespread and regular activity in the U.S., and is generally disapproved of in cultural norms: only 18% of a sample of San Francisco males agreed that any drinking would be "all right" for themselves as "an employee on the job," a far lower figure than for any other situation, although it should be noted that 67% agreed that at least a couple of drinks would be "all right" for themselves with "a couple of fellow workers out to lunch" (Room and Roizen, 1973). Only 24% of basically the same sample reported ever having had a drink with others on the job, and 11% reported ever having come to work drunk (Hitz, 1973).

The inattention to drinking on the job in the American empirical accident literature reflects perhaps the most lasting influence of the temperance movement: the removal of alcohol from the workplace.

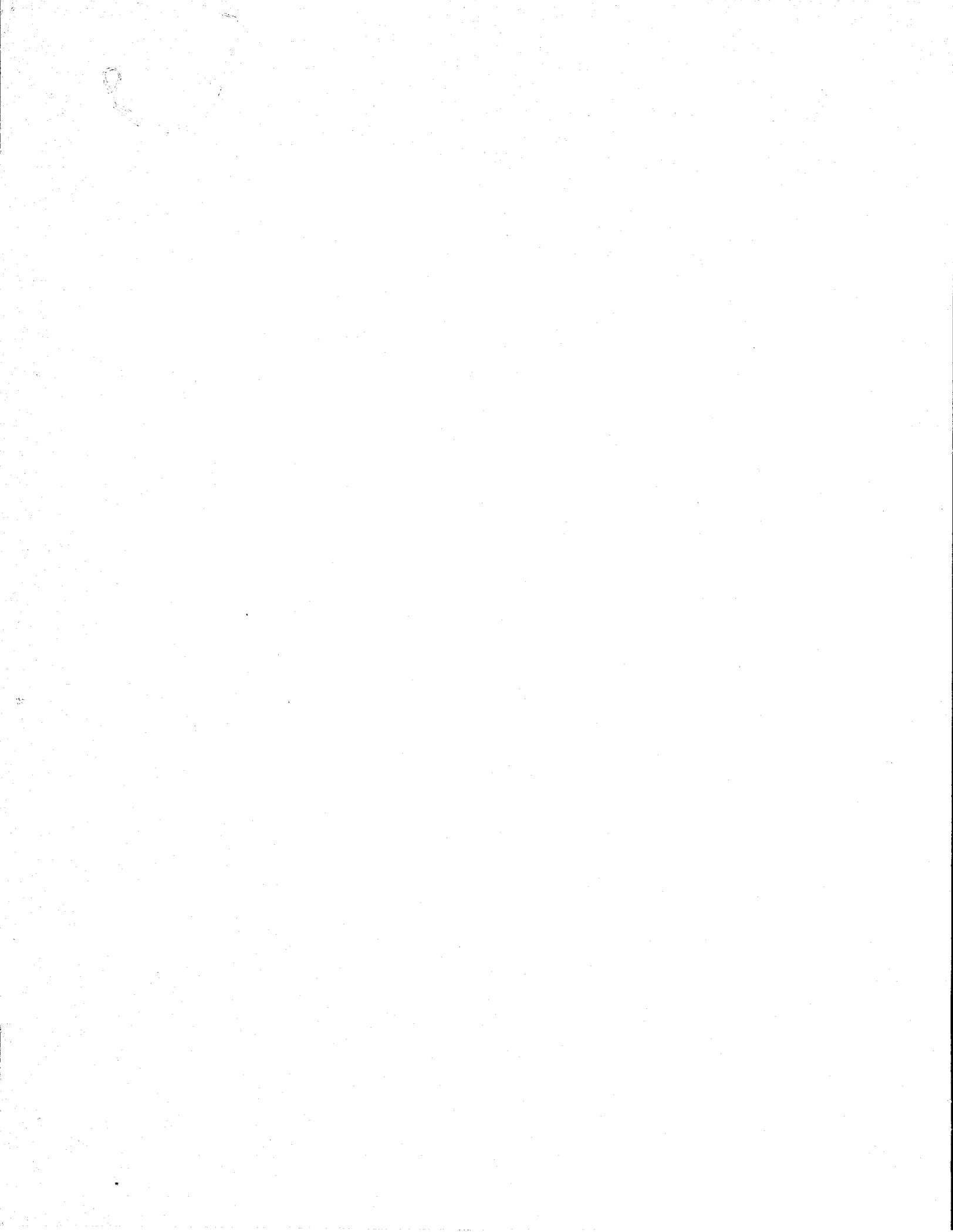
In eighteenth-century and early nineteenth-century America, as in other countries, the workplace was a major locale of drinking, and the male work-group was the major drinking group (Stivers, 1976). The virtual removal of alcohol from the workplace which we now take so much for granted was the result of a long struggle by the temperance movement, joined at the end of the nineteenth century by industrialists interested in a sober workforce for both material and paternalistic reasons. The workingman's job tenure was a major level for enforcing general sobriety: at the turn of the century, a number of American railroads required total abstinence by their employees, off the job as well as on (Timberlake, 1963, pp. 67-69).

In countries where the temperance movement was never strong, the removal of alcohol from the job apparently never occurred: a 1956 study found Frenchmen still regarding alcohol as a necessity for getting through a day of manual labor (Sadoun, Lolli and Silverman, 1962). The empirical results in French accident studies, and particularly in Lederman & Metz's controlled study, reflect the considerable difference between French and American norms on drinking on the job.

Despite the concern over the problem drinker in industry, empirical studies of the accident experience of employees differentiated by their drinking history have been relatively rare, even in the U.S. (Table A-11). Measures of drinking history are based on the opinions either of supervisors or of industrial, medical or personnel officers. Except for one study of public transport workers in France and Trice's U.S. study, the relative risk of industrial accidents among "alcoholics" as against other employees has fallen fairly uniformly in the range of 2-3. Of course, more information is needed to show whether their alcohol use actually causes the accidents; perhaps this association only reflects the fact that alcoholics are of an age group or personality that are more prone to accidents.

Table A-11
 Empirical Studies -- Accidents
 Industrial Accidents by Drinking History

Author, date, location	# accidents/ sample	Relative risk	Comparative population	Alcohol measure	Sex	Age	Restrictions Other	Follow-up period	Years exposure
<u>United States</u>									
Vernon, 1936 U.S.	--	3	members of insurance fund	chronic drinkers, unknown measurement	--	--	--	--	--
Jellinek, 1947 U.S.	390,000/ 1,370,000	--	no comparison	alcoholics, unknown measurement	--	--	--	1943	--
Observer & Maxwell, 1959 U.S.	55/48	2	other employees	supervisor's opinion	MF	--	--	--	--
Trica, 1965a, U.S.	9/72 "lost time accidents"	1.5	other employees of "large eastern" U.S. company	"alcoholic" in medical department diagnosis	MF	--	--	1953-1961	360 (alcoholics)
	14/72 all accidents	1							
<u>Foreign</u>									
Hollitscher, 1890s Germany	--	3	other employees	--	M	25-44	--	--	--
Morice, 1953 France	--	2	other employees	chronic alcoholics, unknown measurement	--	--	--	--	--
Cavalié, 1956 France	--	19	other public transport employees	alcoholic employees, unknown measurement	--	--	public transport	--	--
Lundén, 1958 Sweden	74/21	2	moderate users and abstainers among other employees (508/241)	alcoholics and abusers, formens' and authorities reports of drinking habits & problems	M	--	heavy machine industry	1946-	1,572



Perhaps only alcoholics who are also already having trouble at work are identified as such by their supervisors. We have found no studies beyond the self-report studies by Trice summarized above that report the industrial accident experience of samples of alcoholics. It is clear that skid-row and other down-and-out chronic inebriates are employed, often on a casual basis, in many jobs where the industrial accident rate is high.

Despite a lengthy history of concern, empirical work on the role of alcohol in industrial accidents is clearly very sparse. We have little sense from the available literature of whether there is a substantial relation between drinking and industrial accidents, and even less information on what forms the relation may take. In holistic terms, it seems that accidents in the workplace are unlikely to be an obvious and fruitful area in an overall strategy for reducing injuries and deaths due to drinking. It is notable that, while Lang and Mueller (1976) found 25% with BACs of .10 or more among non-industrial burn cases, they found none above .03 in 31 industrial burn cases. Brenner (1967) notes that, while Observer and Maxwell's (1959) experienced problem drinkers did not have more on-the-job accidents than other workers, they had a markedly higher rate of off-the-job accidents. In preventing alcohol-related accidents, the workplace may not be the place to start.

However, empirical studies of drinking-accident relationships in occupations where drinking on the job is thought to be common may well suggest some fruitful workplace-oriented approaches on a smaller scale.

Aviation Accidents

In 1971, 1204 persons died in the U.S. in 597 general aviation accidents (excluding commercial and military aviation). About as many passengers as pilots are killed in such accidents. Warnings about the harmful effects of alcohol use when flying appeared in the early 1900s right along with the invention of the airplane. Such items as a World War I French flight surgeon's guide of 1919 and lay aviation books of the 1930s and 1940s cautioned against drinking and flying. However, pilots have long ignored or even contradicted these warnings. As early as 1803, several balloonists maintained alcohol helped them remain coherent at high altitudes! (Mohler, 1966).

Along with these warnings several theories arose about how alcohol use might be involved in aviation accidents and deaths. Some suggest that alcohol might encourage risk-taking and daredevil stunts. More common theories suggest a physiological reaction, such as alcohol inhibiting coordination and good judgment.

Evidence supporting these physiological theories includes numerous experimental studies of physical tasks following alcohol consumption. In addition, Newman and MacFarland demonstrated that alcohol is absorbed more quickly at high altitudes. Noting that alcohol depressed oxidation in the cells they suggested that the combination of alcohol and reduced oxygen at high altitudes might depress a man's judgment and coordination. Newman nevertheless concluded that this was not a serious practical problem, since most planes are pressurized at high altitudes (Newman, 1949; MacFarland, 1953). In a more recent study, 16 volunteer pilots tested in a flight simulator (without the effects of high altitude) exhibited significant errors with BACs as low as .04 (Billings, 1973).

The above experiments demonstrate how alcohol use might affect a pilot's performance. Determinations of how much alcohol use is actually involved in aviation crashes and deaths are made from a totally different type of study. In contrast to industrial accident studies, this empirical literature is almost

Table A- 12

Empirical Studies--Accidents
Aviation " fatalities

Author, date, location	No. studied/ eligible	% alcohol present	Alcohol measure	Sex	Restrictions Age	Time	Other	Years of collection
<u>United States</u>								
Harper and Albers, 1964 U.S.	158/477	35 BAC _{>.01}	BACs all cases	--	--	--	no air carrier or military crashes	1963
Gibbons and Plechus, 1965 N.M., Tex., Ok., Ark, La.	86/--	30 BAC _{>.01}	65% BACs 77% autopsies some witness reports	--	--	--	no air carrier or military crashes	1964
Gibbons et al., 1967 Southwest U.S.	61/76	31 BAC _{>.01}	BACs all cases	--	--	--	no air carrier or military crashes	1965
Davis, 1968 U.S.	2,123/3,912	5 BAC _{>.01} 0.4 no contam- inated 0.2 maybe causal 0.1 definite causal	BACs all cases	--	--	--	military pilots, crew, passengers	?-1966
Mohler et al., 1968 Northwest U.S.	1,366/-- (29-74%)	32 pos. BAC	BACs all cases	--	--	--	--	1963-1967
Smith et al., 1970 U.S.	202/223	14 BAC _{>.05}	BACs all cases	--	--	--	--	--
Ryan and Mohler, 1972 U.S.	2,824/5,290	25 BAC _{>.01}	BACs all cases	--	--	--	no air carrier or military crashes	1963-1971
Davis, 1973 Washington D.C.	344/--	30 5 history of ingestion	gas chromatography all cases	--	--	--	general pilots	1962-1967
Lacefield, 1975 U.S.	588/1,385	44 pos BAC 9 BAC _{>.05} in 1974	BACs all cases	--	--	--	civilian pilots	1967-1974
Zeller, 1975 U.S.A.P.	4,200/-- accidents	0.7 2.2 w/drugs	unspecified	--	--	--	USAF accidents	1962-1973
<u>Foreign</u>								
Heise, 1964 Sweden	92/--	14 pos BAC	BACs unknown no.	--	--	--	--	--
Underwood Ground, 1975 U.K.	102/--	33 pos BAC 12 evidence of inges- tion	BACs all cases	--	--	--	pilots of light aircraft	1964-1973

entirely American. The research is relatively recent, beginning in the early 1960's, and usually only pilots dying in aviation accidents have been studied. Generally, these coroner studies take BACs of the dead pilots or ask witnesses about the pilot's use of alcohol on the day of the crash. Their findings are reported in terms of what percent of the dead pilots were under the influence of alcohol at or near the time of the crash.

As seen in Chart I, these findings range from 0.7 to 44%. This variation can be explained somewhat by differences in the populations studied and research design. (See Table A-12). Accident rates and drinking habits differ greatly between general (including private), commercial, and military pilots. There are no studies of the pilot's drinking in commercial aviation crashes, but the strict airline rules on abstinence before and during a flight and the strict emphasis on safety make a high rate of alcohol in the event unlikely. The two military pilot studies found relatively low proportions had been drinking. It is in private and other general aviation that alcohol is likely to be involved in the event; the empirical findings of alcohol in the event range in these studies from 14 to 44%.

The proportion of all dead pilots included in the study will also affect the range of alcohol involvement, for frequently coroners only test pilots where alcohol use is suspected. If only these cases are included, an artificially high percentage of alcohol use may be obtained. Consider the yearly studies done by the Federal Aviation Administration:

Table A-13 Alcohol In General Aviation Accidents

Year	Number of Fatal Accidents	Number of Fatalities	Pilot Toxicology Obtained	Number w/ Positive Alcohol*
1963	477	900	136(29%)	59(43%)
1964	510	980	215(43%)	62(39%)
1965	543	1020	293(54%)	105(36%)
1966	564	1123	347(62%)	94(27%)
1967	605	1200	394(69%)	63(22%)
1968	713	1458	444(65%)	91(20%)
1969	655	1418	393(60%)	76(19%)
1970	626	1293	348(55%)	61(18%)
1971**	597	1204	256(43%)	52(20%)

* 15 mg % blood level, or greater

** As of March 1, 1972

FAA Records

Source: Ryan and Mohler, 1973, p. 1025.

Over the years the number of fatal accidents, fatalities, and the proportion of pilots tested have increased while the percent with alcohol involvement has decreased. The higher proportion of alcohol deaths in the early 1960s may indicate that coroners were testing only suspicious cases rather than that alcohol use was higher in the 1960s.

It must be noted that the most assiduous coroner will be unable to test for alcohol in all dead pilots, for after several hours the alcohol consumed by the pilot may have dissipated, while putrefaction of the body begins to create an alcohol-like substance that can artificially raise the BAC. Gibbons et al. attempted to deal with these problems by studying crashes where these measurement problems were not at issue. Using one sample of 61 dead pilots and another of 86, they found situational and personal characteristics differentiating between drinking and sober pilots: a higher percentage of alcohol use was found in private pilots, among those aged 45-54, and where the pilot was flying at night (Gibbons and Plechus, 1965; Gibbons et al., 1967).

Of course, knowing what percent of dead pilots have been drinking does not tell us if alcohol use is related to fatal crashes. We need to know what proportion of pilots in the air who do not crash have been drinking, to determine if alcohol use is over-involved in aviation fatalities. Among aviation personnel an accepted estimate of alcohol use by pilots appears to be 0.6% (AOPA 1965). If this is true, alcohol use would seem to be definitely over-involved in fatal accidents. Although it would be difficult to design and carry out, a survey of various types of pilots flying at different times of the day could validate or correct this estimate and would give a useful comparison to the coroner's studies. Likewise, the proportion of alcohol use by pilots of non-fatal accidents would be a useful comparison.

Drowning

"What's a drunken man like, fool?"
 "Like a drowned man, a fool, and a mad man:
 one draught above heat makes him a fool;
 the second mads him; and the third drowns him."

(Shakespeare, Twelfth Night, I,v, 137-141)

Drowning, a major category of accidental death in the U.S., killed 7,900 people in 1975, 85% of whom were male, and 60% under the age of 25 (National Safety Council, 1976). These deaths occurred in a wide variety of situations such as boating accidents, swimming, fishing, falling into natural bodies of water, swimming pools, and bathtubs. Theories on how these many deaths occur have long included the ill effects of alcohol use, and are as varied as the situations leading to death.

For example, some theories propose that boating accidents are frequently caused by poor judgment, coordination, and attention associated with alcohol use. Swimmers may take more risks, such as swimming farther from shore than they normally would, while the "pseudo-warmth" effect of alcohol may encourage swimmers to remain in cold water too long, causing overexposure and subsequent drowning (Press, et al., 1968). After one too many beers, fishermen may stumble or pass out, and fall off the boat or pier. Similarly, when drinking at home, poor coordination can cause a person to fall into a swimming pool and leave him too muddled to safely climb out, or to fall into a full bathtub where, cracking his head, he is knocked out and drowns. In any of these situations, Zylman suggests that alcohol may adversely affect the swallowing and breathing reflexes, decreasing the drowning person's chances of survival -- just as a high proportion of alcohol use is found among choking victims. (Zylman, 1976).

While theories like these have existed for many years, and as early as 1911 three life insurance physicians estimated that 13% of all drownings involved alcohol (Phelps, 1911), research specifically oriented to the role of alcohol in drowning did not begin until the mid 1960s. This research includes

mainly coroners' studies which determine what percent of drowning victims have high BACs or other evidence of alcohol use near the time of the drowning.

As seen in Chart I, the findings of these studies range tremendously, from 4 to 83%. This variation can be explained somewhat by differences in the subjects studied and the research design. (See Table A-14) For example, drowning rates, reporting practices, and drinking habits vary from country to country. If only the seven American studies are considered, this range reduces to 12-69% -- which is, of course, still substantial.

The ages of the drowning victims studied will also affect this range. Drowning particularly affects young children 0 to 4 years old and young adults 15 to 24 years old. A study including all deaths would presumably have lower alcohol rates than one limited to adults. For example, in Australia 22% of adult drowning victims involved alcohol while only 13% of all drowning victims involved alcohol (Adams, 1966). Likewise the sex proportion and time of year the data is collected will affect the findings. In the U.S. 60% of all drownings occur during the four months May - August (National Safety Council, 1976). Few studies have published the age and sex and none the time of occurrence for alcohol-involved drownings. Data from Giertsen (1970) and Plueckhahn(1972) suggest that alcohol-related drownings are if anything more male-dominated than other drownings, although Stiehl's (1975) results with a sample of four women do not support this. Both Plueckhahn and Giertsen found alcohol-related drownings concentrated among the middle-aged, which contrasts with the pattern for drowning generally.

Table A-14
Empirical Studies--Accidents
Drowning

Author, date, location	No. studied/ eligible	% alcohol present	Alcohol measure	Sex	Age	Restrictions Time	Other	Years of collection
<u>United States</u>								
*Fisher, 1952 Baltimore and Boston	16/--	69	BACs unknown no.	--	--	--	--	1949
*Wilentz, 1953 New Jersey and New York	64/--	62	unspecified	--	--	--	--	1933-1951 1948
*Metropolitan Life, 1968 U.S.	16/--	20	unspecified	MF	15-64	--	home	1964-1965
Press et al., 1968 Ill., Col., Fla., N.C., N.Y.	1201/1608	12	coroner's rpt. on 68% based on autopsies, police, family, friend rpts.	MF	--	--	--	1965-1966
*Waller, 1972	17/--	30 Pos. BAC	BACs unknown no.	MF	Over 14	6 hrs.	Non-highway consecutive	1965-1967
Dietz and Baker, 1974 Baltimore, Md.	45/--	47 BAC _{>.03} 38 BAC _{>.10}	BACs all cases	--	over 14	12hrs	not im- mersed in car/truck	1968-1972
Stiehl, 1975 8 cities, U.S.	543/1240	47 BAC _{>.01}	BACs all cases	MF	--	--	--	1955-1974
<u>Foreign</u>								
*Bowden et al., 1958 Australia	--/--	4 pos BAC	BACs all cases	--	--	--	--	1951-1956
Adams, 1966 New South Wales, Australia	163/200	13 22 adults	BACs unknown no. family/friend rpts	MF	--	--	--	1962-1964
Stjeruvall, 1969 Finland	935/--	34	BACs on 2/3 police records 1/3	MF	over 15	--	--	1964-1966
Jääskeläinen, 1969 Turku, Finland	72/87	62	BACs unknown no.	MF	adults	--	--	1964-1968
Alha et al., 1970 Finland	156/511	83	BACs all cases	MF	--	--	--	1967
Giertsen, 1970 Norway	350/--	21	annual estimate	MF	--	--	--	1950-1968
*Cutler and Morrison, 1971 British Columbia	74/--	30 BAC _{>.01}	BACs 47% sample, witness rpts on rest	MF	--	--	--	1968
Plueckhahn, 1972 Geelong, Victoria, Australia	22/45	36 BAC _{>.0} 32 BAC _{>.15}	BACs all cases	MF	over 15	--	--	1967-1971
Hirvonen and Ojala, 1973 Finland	104/119	65	BACs unknown no.	--	over 15	--	--	1969-1972
Arner, 1973 Norway	1027 deaths among merchant seamen	33 all deaths 50 drownings	unspecified	M	--	--	--	1957-1964
*Alha et al, 1974 Helsinki, Finland	46/--	57	BACs unknown no.	--	--	--	--	1971
Naeve, 1976 Hamburg, W. Germany	--	78	unknown estimate	--	--	--	harbor region	1962-1975

*Coroner and emergency room studies which cover more than this casualty. See Tables A-2 and A-3 for other casualties.

Another factor affecting the range in findings is the proportion of all drownings studied, for frequently coroners take BACs only when alcohol use is suspected. If only these cases are included in the study, an artificially high rate of alcohol use is probably found. Likewise, whether victims are tested for BACs within a short period after death also influences how much of the alcohol found was consumed as a beverage and how much is due to putrefaction of the body.

A few studies have attempted to go further than arriving at a single figure by identifying what type of people are drinking and drowning. In 1968 Press et al. identified drowning victims in five states by type of swimmer and alcohol use. The above mentioned limitations and the large number of unknowns prohibit any solid conclusions, but it appears more victims who were good and average swimmers had been drinking than poor or non-swimmers (See Table A-15).

TABLE A-15 Proficiency at Swimming among Drowning Victims by Alcohol Use (where both are known)

Alcohol Use	<u>Type of Swimmer</u>				Total where type is known (N)	Unknown (N)
	Good	Average	Poor	Non-swimmer		
Yes	29%	31	12	28	100% (58)	(91)
No	19%	18	12	51	100% (422)	(257)
Unknown	31%	33	8	28	100% (72)	(301)

Source: Press, et al., 1968, p. 2287.

In 1974 Dietz and Baker identified Baltimore City drowning victims over 15 years old by type of activity involved and BAC level. With a relatively small number of cases, they found that drinking appears to be more common among swimming deaths than others -- 79% of swimmers had a positive BAC (See Table A-16).

TABLE A-16 Number of Drowning Victims by Activity and BAC Levels

BAC % by weight	Activity				Total
	Swimming	Boating	Stepped into Deep Water	Other	
0.00	3	3	8	10	24
0.01-0.09	2	1	0	1	4
0.10-0.19	4	2	0	1	7
0.20 or over	5	1	3	1	10
Total	14	7	11	13	45

Source: Dietz and Baker, 1974, p. 308.

On the other hand, Plueckhahn (1972), with even smaller numbers, found swimmers (5/14) less likely than boaters (2/3) to have a BAC above .15. Data from Press et al. (1968) also suggests a lower rate of alcohol involvement among swimmers. While for 12% of all drownings in their study there was evidence of alcohol ingestion, the percentages by activity were: for the 293 swimming deaths 8%, for the 105 power boat deaths 14%, for the 425 other water activities 10%, for the 130 non-water activities 15%, and for the 247 with unknown activities 21%. The high alcohol involvement among those with unknown activities may reflect a particular association of alcohol with solitary drownings: Giertsen (1970) reported that 78% of his 86 drownings under the influence of alcohol were unwitnessed.

Both Cutler and Morrison (1971), dealing with British Columbia Indians, and Giertsen (1970), with Norwegian data, mention the significance of the late-night drunken return from the party in a water-oriented culture as a substantial factor in accidental drownings.

In several of the studies there is mention of the frequency of sudden death upon immersion of intoxicated persons; "the eyewitness' description of such accidents is nearly always the same: 'he disappeared and was never seen to surface or to struggle'" (Giertsen, 1970; see also Plueckhahn, 1972). Another factor which appears to interact with alcohol is very cold water; thus while Press et al. (1968) report evidence of alcohol ingestion for 46% of 116 cases where the water was known to be very cold, evidence of alcohol ingestion was present for only 12% of the total sample. Several possible physiological mechanisms for a synergistic effect of alcohol and cold are discussed. (Plueckhahn, 1972; Press et al., 1968; Giertsen, 1970); it is also possible that drunken persons may be more likely to find themselves in very cold water because of poor coordination or judgement.

There is, as yet, no study of alcohol in the drowning event which has a control population of those at risk but not drowning. A high proportion of drownings occur in leisure-time activities which are quite likely to involve drinking. We may speculate that drinking may on occasion even protect from the risk of drowning: the drinker on the beach may be less likely to take a swim, the drinker on the boat may be less likely to venture near the side of the boat. Without more complete studies we are left in the realm of anecdote and speculation, such as the observation that the connection of drinking and drowning is often through falling off a boat fully clothed while standing up to urinate.

While the studies cited above have considered alcohol use and the drowning event, a few non-American researchers have approached the relationship of alcohol and drowning by studying deaths among alcoholics. In three studies covering varying lengths of follow-up of samples of identified alcoholics, 0.3, 0.4, and 0.5% of the alcoholics died by drowning (Dahlgren, 1951; Nicholls et al., 1974; Dijk and Dijk-Hoffman, 1973) (See Tables A-9 and A-23). These findings are useful only to the extent they can be compared to non-alcoholics' drowning death rates. Dahlgren compared his alcoholic population's death rates to age, sex, marital status, and residence-specific death rate of Sweden and found that alcoholics had a relative risk of drowning of 3.8 (see Table A-8). Whether their higher death rate is due to alcohol use or lifestyle or environment is yet to be determined.

Fire Accidents and Burns

Most fire deaths occur in a conflagration of a private home. While relatively few deaths are caused by localized fires -- burning clothing etc. -- or by scalds and other non flame burns, these are common sources of injury. Fire deaths are 61% male, disproportionately occur to the very young and to older persons, and are moderately concentrated in the winter months. The U.S. rate of death from fires has fallen substantially in this century, by 40% since the 1940's (National Safety Council, 1976).

Well into the nineteenth century it was believed that drunks could spontaneously combust (de Moulin, 1975). While this theory has fallen by the wayside, many other theories of alcohol's association with fire deaths and injuries have arisen. They generally fall into three main areas: (1) the ignition, (2) detection and (3) escape from the fire, and can be discussed in reference to the person responsible for starting the fire, the victim, or the victim's guardian.

For example, a person (not necessarily the victim) may start a fire after alcohol has blurred his coordination and judgment; he may fall asleep (or pass out), and drop a cigarette on the couch or mattress; he may stumble into a lighted barbeque or start a grease fire in the kitchen. In the area of fire detection, the victim or victim's guardian may be too drunk or sick to wake up or notice the fire alarm or smell of smoke until it is too late. Finally, alcohol use may inhibit escape or rescue once the fire has been detected: in addition to affecting judgment and coordination, alcohol lowers oxidation in the cells and compounds a person's chances of succumbing to smoke inhalation and suffocation. A child, handicapped, or elderly person may be forgotten in the confusion, or lost in the guardian's muddled efforts to rescue them.

Most research fails to address any of the above theories directly, mainly because it studies only victims without determining if the victim started the fire, or if he failed to escape due to his own or his guardian's efforts. One study found that 8% of all fires and 14% of all deaths were caused by an "incapacitated" person; however, "incapacitated" was defined to include drugs and sleeping as well as alcohol use (Ottoson, 1974).

Most of the available research on alcohol and fires determines if alcohol was used near the time of the fire by taking BACs or by interviews. Subjects may come from coroners' lists or emergency room admissions. The latter include burns from such items as grease, chemicals, steam, and electricity, as well as fire burns. As seen in Chart I these studies found 9 to 83% of all fire fatalities and 17 to 62% of injuries involved alcohol use at the time of the accident. Alcohol use has generally been determined by taking BACs of victims. The magnitude of these ranges is probably due to variations in subjects selected and research design. (See Table A-17 for detailed information). Since most studies have been conducted in the United States in the last 10 years, variations in drinking habits, fire reporting, and fire control between countries is not a problem in this area.

The age breakdown of each sample probably has the greatest effect on the amount of alcohol use found. Young children 0 to 4 years old and adults over 65 are over-represented in fire deaths, while the presence of alcohol is found mainly in middle-aged fire victims (Berl and Halpin, 1976). If a sample includes only 16 to 60 year olds (such as Hollis, 1973) or only adults, the amount of alcohol found should be higher than if all deaths are included, (especially since there is no way to connect very young or old deaths to the guardian or responsible party's use of alcohol.) For example, Halpin found 52% of adult fire deaths involved alcohol while only 42% of all deaths involved alcohol (Halpin, et al., 1975).

Table A-17

Empirical Studies—Accidents
Fire and Burns

Author, date, location	No. studied/ eligible	% alcohol present	Alcohol measure	Restrictions				Years of collection
				Sex	Age	Time	Other	
<u>Fatalities: United States</u>								
*Joss, 1947 Minnesota	3/--	60 BAC \geq .20	BACs all cases	MF	--	--	--	1943
*Metropolitan Life, 1968 U.S.	233/--	25	unspecified	MF	15-64	--	home	1964-1965
Crikelsir, et al., 1968 Harlem, New York	17/--	53	unspecified alcoholic label	MF	--	--	89% black	1966-1967
NPPA, 1969 U.S.	3145/--	9 12 adults	unspecified; intox. includes alcohol and other drugs	MF	--	--	single fatality	1968
*Waller, 1972 Sacramento, Calif.	22/--	64 BAC \geq .10	BACs unknown no.	MF	over 14	6 hrs	non-high- way; con- secutive	1965-1967
Hollis, 1973 Memphis, Tenn.	29/--	83 pos BAC 87 " " in smoking fires	BACs all cases	--	16-60	--	--	1960-1968
Halpin et al., 1973 Maryland	101/106	30 62 smoking fires	BACs unknown no.	--	--	6 hrs	--	1971-1973
*Haberman and Baden, 1974 New York, New York	10/--	30	BACs on 44.5% sample; some autopsies; family/ friend rpts on 100% sample	MF	over 18	--	trauma; consecu- tive	Feb-Apr 1972
Ottoson, 1974 U.S.	702/--fires 474/--deaths	8 fires** 14 deaths**	unspecified; "incapa- citated" included drinking, drugs, sleeping	--	--	--	--	1972
Halpin et al., 1975 Maryland	129=40% Md. fatalities	37 56 smoking fires	BACs unknown no.	--	--	--	--	1971-1974
Halpin et al., 1976 Maryland	206=50% Md. fatalities	42 52 adults	BACs unknown no.	--	--	6 hrs	--	1971-1974
Berl and Halpin, 1976 Maryland	99/257	42 pos BAC 55 pos BAC (adults)	BACs all cases	MF	--	6 hrs	--	1972-1973
Lang and Mueller, 1976 Milwaukee, Wis.	11/--	54 BAC \geq .02	BACs all cases	MF	--	2 hrs	--	1972-1973
<u>Fatalities: Foreign</u>								
*Bowden et al., 1958 Australia	--/--	12 pos BAC	BACs all cases	--	--	--	--	1951-1956
Virkkunen & Alha, 1969 Finland	29/75	83 BAC \geq .10	BACs all cases	--	--	--	--	1967
*Cutler and Morrison, 1971 British Columbia	29/--	41 BAC \geq .01	BACs 47% sample; witness rpts on rest	MF	--	--	--	1968
<u>Burns: United States</u>								
Crikelsir et al., 1968 Harlem, New York	123/145	23 26 adults	unspecified alcoholic label	MF	--	--	89% black	1966-1967
*Wechsler et al., 1969 Boston, Mass.	33/--	18 BAC \geq .01	BACs on 82%; interviews on all	MF	over 16	--	alive on arrival	1966-1967
MacArthur and Moore, 1975 Boston, Mass.	155/--	17 all burns 27 home 0 industrial, institutional 14 other	unspecified	MF	adult	--	consecu- tive	--
Lang & Mueller, 1976 Milwaukee, Wis.	83/124	62 BAC \geq .01 15 BAC \geq .10	BACs all cases	MF	--	2 hrs	--	1972-1973

*Coroner and emergency room studies which cover more than this casualty. See Tables A-2 and A-3 for other casualties.

** Caused by "incapacitated" person.

Alcohol involvement was also found to vary by sex. In one study, 57% of all fire deaths were male while 76% of all alcohol involved deaths were male (Berl and Halpin, 1976). Time of the fire did not appear to vary by alcohol involvement. All deaths seemed to cluster around midnight, especially in the winter.

Finally, as in all coroner and emergency room studies, variations will occur if BACs are not taken soon after the fire, for alcohol in the system dissipates and dead bodies will begin to putrefy. In emergency rooms, victims should be asked if they have had a drink since the injury, and the source of the burn should be recorded (e.g., fire or hot water).

To determine how much of a problem alcohol use is in fire deaths and injuries, it is also important to know what proportion of people who escaped from the fire and what proportion of neighbors who did not have fires had been drinking. Perhaps the amount of alcohol found merely reflects the amount of alcohol use in the community. Or perhaps drinkers have other things in common that make them fire-prone. One obvious factor is the clear association of amount of drinking with amount of smoking (Cahalan, Cisin & Crossley, 1969, p. 148). As association with alcohol use may only be reflecting a relation with cigarette use. Or both may be reflecting some other aspect of lifestyle.

Three studies have offered data on the interrelation of alcohol use and smoking in fire mortality. Hollis found that 88% of 16 cigarette-caused fire deaths had positive BACs, as compared to 30% of 33 fire deaths from other causes (Hollis, 1973). Berl and Halpin (1976) found a greater relation of alcohol use to cigarettes among fire victims. Sixty-two percent of 50 cigarette-caused fire deaths had positive BACs, as against 22% of 49 other fire deaths (see Table A-18).

Table A-18

Cigarettes as Ignition Source

	Yes %	No %	Total %
BAC Pos	62	22	42
Neg	38	78	58
Total (N)	(50)	(49)	(99)

(Adapted from Berl and Halpin, 1976)

A Metropolitan Life study of insurance policyholders (1967), using as an alcohol indicator either drinking in the event or a history of heavy drinking, found alcohol involvement in 25% of the 67 fatalities from fires and burns where "smoking in bed, chair, other places" was involved, but in only 2% of the 166 other fire and burn fatalities. These results, while not conclusive, certainly suggest a linkage of alcohol and cigarettes in the events of a fatal fire.

The linkage is well recognized in the anecdotal lore of the fire field: "alcohol and tobacco are often indulged in together, and the combination leads to severe burns because the drug reduces awareness and the flame ignites hair, clothing or furniture. Quite characteristically, the [burn] patient is sitting in an overstuffed chair, smoking, drinking, and watching television" (MacArthur and Moore, 1975). Apparently in many fatal cases, the victim is roused by the fire but collapses after a few steps.

Only two studies have been found which ascertained the drinking history of fire or burn victims. The first reported 23% of non-fatal burn victims and 53% of the fatal cases were alcoholic (Crikelair et al., 1968). The second found 26% of the fire fatalities were alcoholic (Haberman and Baden, 1974). These studies were both conducted in New York but Crikelair's sample consisted of 89% Blacks, so comparisons should be made with caution.

Three follow-up studies of alcoholics have examined their fire mortality finding that 0.2 to 1.2% of alcoholics die in fires (Schmidt and deLint, 1972;

Nicholls et al., 1974; Medhus, 1975).

Since each study is from a different country, with different drinking habits and fire control practices, comparisons between studies should be made with caution.* A Canadian study compared the clinical alcoholic fire death rate to that of the general population, and found that alcoholics had 9.7 times as much chance of dying in a fire as a standard comparison population (Schmidt and deLint, 1972). Of course, this comparison is likely to reflect living patterns at least as much as any direct effect of drinking: alcoholics who have been institutionalized frequently live in poorer neighborhoods, which include many fire traps.

All of the studies mentioned so far deal with alcohol use and the fire victim, rarely differentiating responsible persons from innocent victims. Other possible avenues of involvement of alcohol in fire mortality and injury include alcohol use by arsonists and firefighters. A few studies on the former will be included in the following chapter on crime. In these, arsonists appear to be among those criminals reporting the highest use of alcohol during the crime. In one study, 71% of white men and 54% of black men report alcohol use before they started the fire (U.S. Dept. of Justice, 1974). An Australian study reports that 44% of 50 imprisoned arsonists were alcoholic, while 32% of 100 fellow inmates were so labelled. (Hurley and Monahan, 1969). Little information is available on firefighters' alcohol use or response to drunken victims, although firefighters may have a relatively high proportion of heavy drinkers (Hitz, 1973).

Experimental research has shown that alcohol use is associated with poor coordination and judgment. Logically, then, alcohol use could easily directly influence fire ignition, detection, and escape for drinkers and indirectly affect the outcome for children, handicapped and elderly persons in the same household. Available research suggests an involvement of alcohol in fires, but without controlled studies or detailed scenarios of factors in the fire situation our knowledge remains at the level of anecdote.

* See Table A-23 for description of samples used in individual studies.

Falls

Falls are the most common cause of accidental death in the United States after motor vehicle accidents (National Safety Council, 1976). Falls are even more important as a source of injuries, accounting for 67% of injuries reported in the National Health Survey (Table A-1). Deaths from falls are slightly more common among males than females; while over half occur to persons over the age of 75.

The linkage of alcohol and falls is common in such everyday expressions as "a falling-down drunk." Experimental research shows that alcohol use does indeed affect coordination and judgment. Epidemiological studies of the association of alcohol and falls have primarily been concerned with alcohol use near the time of the fall.

As can be seen in Chart I, six studies found alcohol involved in 10 to 70% of all deaths from falls. Five studies found 13 to 63% of all fall injury victims had used alcohol near the time of the fall. The most frequent method of measuring alcohol use was a positive BAC when admitted to the emergency room or as determined by the coroner. The magnitude of these ranges can be explained somewhat by variations in age groups studied, sample size, the country involved and in the familiar problems of the completeness and the quality of the sample selection. (See Table A-19 for information on specific studies.)

The age composition of the sample may well have one of the greatest effects on the range of alcohol involvement found, since older age groups predominate in injuries and deaths from falls. In general, older people are less likely to drink heavily than younger people (NIAAA 1974). While alcohol use may contribute to their falls, brittle bones and arthritis are likely to compound the problem.

The single study of the drinking history of those dying from falls found that 44% of deaths from falls were alcoholics. This was a New York sample of persons over 18 years old, where alcoholism was determined by liver cirrhosis and reports

Table A-19

Empirical Studies--Accidents
Falls

Author, date, location	No. studied/ eligible	% alcohol present	Alcohol measure	Sex	Restrictions			Years of collection
					Age	Time	Other	
<u>Fatalities: United States</u>								
*Wilentz, 1953 New Jersey and New York	425/--	21	unspecified	--	--	--	--	1933-1951 1948
*Metropolitan Life, 1968 U.S.	288/--	17	unspecified	MF	15-64	--	home	1964-1965
*Waller, 1972 Sacramento, Calif.	10/--	70 BAC \geq .10	BACs unknown no.	MF	over 14	6 hrs	non-high- way; con- secutive	1965-1967
*Haberman and Baden, 1974 New York, New York	9/--	33	BACs on 44.5% sample; some autopsies; family/ friend rpt on 100% sample	MF	over 18	--	trauma; consecu- tive	Feb-Apr 1972
<u>Fatalities: Foreign</u>								
*Bowden et al., 1958 Australia	--/--	10 pos BAC	BACs all cases	--	--	--	--	1951-1956
*Cutler and Morrison, 1971 British Columbia	33/--	49 BAC \geq .01	BACs 47% sample; witness rpts on rest	MF	--	--	--	1968
<u>Non-fatalities: United States</u>								
*Wechsler et al., 1969 Boston, Mass.	272/--	23 BAC \geq .01	BACs on 82%; inter- views on all	MF	over 16	--	alive on arrival	1966-1967
Waller, 1973 Chittenden Co., Vermont	150/--	13 8 thought contributory	Self-report 96%	MF	60 or over	--	--	1971-1972
<u>Non-fatalities: Foreign</u>								
Amann, 1961 Vienna, Austria	515/--	63	unspecified	--	--	--	head injuries mainly from falls	1957
Galbraith, et al, 1975 Glasgow, Scotland	400/--	56 pos BAC 75 pos BAC (males over 18)	BAC all cases	MF	--	--	head injuries (92 from falls)	--
*Honkanen and Visuri, 1976 Helsinki, Finland	333/--	42 pos BAC	BACs all cases	MF	over 14	4 days	natives	1972-1973

*Coroner and emergency room studies which cover more than this casualty. See Tables A-2 and A-3 for other casualties.

from family and friends (Haberman and Baden, 1974). It should be noted that not all liver cirrhosis is caused by alcoholism, while on the other side, bereaved families and friends are likely to underreport undesirable characteristics (such as alcoholism) about the deceased.

Finally, four followup studies of treated alcoholics found that 0.3 to 3.5% die from falls over various periods of time. By comparing death rates among the alcoholics to age and sex-specific general populations, three studies found that alcoholics have from 5.6 to 16.3 times the chance of dying from a fall (Schmidt and deLint, 1972; Brenner 1967; and Nicholls et al, 1974). Again, the variation in the findings of these studies is probably partly due to the country involved and research design. Treated alcoholics of course differ from the general population on many characteristics besides drinking. They tend to have different lifestyles and live in poorer neighborhoods, and may fall more because they are exposed to environmental hazards, such as rickety stairs and cracked sidewalks.

Treated alcoholics then, do appear to have a greater risk of a fatal fall than other persons of similar age and sex, although we do not know if this is due to poorer health, lifestyle, poor housing, or alcohol use itself. Studies of alcohol use at the time of the fall report 13 to 63% of injuries and 10 to 70% of deaths due to falls involve alcohol. No comparable data exists, though, to determine if that involvement is higher or lower than the population that did not fall.

Other accidents

Other accidents (e.g., poisoning, asphyxiation, hypothermia, frostbite) have also been studied by coroners and in emergency room reports. Of these only poisonings account for a large proportion of deaths and injuries. Poor judgment, coordination, and risk-taking have all been suggested as the means by which alcohol use may contribute to these injuries and death. Lack of knowledge about the dangers of alcohol use, alone and in combination with other drugs, has also been suggested in accidental poisonings (as opposed to suicidal and homicidal poisonings). As in the previously discussed casualties, the cases included are frequently a biased selection of all such accidental injury and death. There are no comparative populations to determine if alcohol use is indeed more frequent in these victims or only a reflection of alcohol use in the exposed population.

Therefore, we report only as possible suggestive leads for future research what proportion of those tested in each area appeared to have been using alcohol: poisonings 9-79%; food asphyxiation deaths (choking) 70%; hypothermia 72%; frost injuries 90%; frost deaths 100%; snowmobile injuries 4-40%; and tractor accident fatalities 41%. (See Table A-20 for detailed information.)

Table A-20

Empirical Studies--Accidents
"Other"

Author, date, location	Casualty	N studied/ eligible	% Alcohol present	Alcohol measure	Sex	Restrictions			Collection years	
						Age	Time	Other		
<u>United States</u>										
Haugen, 1971 Florida	food asphyxi- ation fatalities	54/--	70	BAC >.10	BACs unknown	--	--	--	--	
Monge and Reuter, 1972 Minnesota	snowmobile injuries	--/--	22 4		--	MF	--	--	--	2 winters
Waller and Lamborn, 1973 Vermont	snowmobile injuries	75/--	40	self-report 21(controls)	MF	--	--	--	1971-1973	
Weyman, Greenbaum&Grace, 1974 New York	hospital cases of hypothermia	39/--	72 82	intox. alcoholic	unspecified	MF	over 21	--	temp. <94° F	1964-1973
Fatteh and Hayes, 1974 North Carolina	poisoning fatalities	300/--	45 41	alcohol abuse 4 with other drugs or volatiles	--	MF	--	--	--	1970
LeGarde and Hudson, 1975 North Carolina	tractor fatalities	22/37	41	BAL > 100mg (equiv. BAC >.10)	BALs all cases	--	--	--	--	1974
National Safety Council, 1976 United States	poisoning fatalities	4000/--	9		unspecified	MF	--	--	--	1974
<u>Foreign</u>										
Alha and Korte, 1971 Helsinki, Finland	all poison- ing fatalities*	485/-- 551/--	45 44		BACs unknown no.	--	--	--	--	1968 1970
	accidental poisoning fatalities	277/-- 328/--	78 73		BACs unknown no.	--	--	--	--	1968 1970
Helin, 1972 Malmo, Sweden	poisoning non-fatal	206/--	50		--	MF	9-15	--	--	1968-1971
Fock and Kyösola, 1972 Helsinki, Finland	surgical patients for frost injuries	170/--	90	intox. at time of injury	unspecified	MF	--	--	--	--
			100	deaths intox.						
Alha and Korte, 1976 Helsinki, Finland	all poisoning fatalities*	579/--	49		BACs unknown no.	--	--	--	--	1974
	accidental poisoning fatalities	361/--	79		BACs unknown no.	--	--	--	--	1974

* Includes accidental, suicidal and homicidal poisonings

E. Conclusion

The empirical data suggests that alcohol is implicated in injury and particularly in mortality for a number of types of accidents, and, in fact, for accidents in general. But we do not know much about the relative importance of the various possible mechanisms of connection, and indeed we do not even know that removing alcohol entirely would substantially lower the accident rates.

Concerning the mechanisms of connection, we know a good deal from experimental data about alcohol's effects on sensorimotor functions, and something from ethnographic and survey data about the influences of beliefs about and norms on drinking, but we have very little notion of the relative contribution of these and other mechanisms, operating at physiological, psychological and social levels, to the occurrence of the event. Even the evidence on whether alcohol's primary contribution is short-term, in the event, or long-term, in the actor's psyche or body, is spotty and equivocal.

In terms of a simple temporal distinction between factors occurring before the event, during the event, and after the event, it is reasonable to speculate that alcohol has an influence in each period. The primary emphasis in the literature has been on alcohol's role before the event. But there are suggestions in the literature that alcohol may influence the course of the event: Honkanen et al. (1976c) found that injuries associated with falls involving alcohol were particularly likely to be to the head and lower legs, and an association of alcohol and head injuries, which are particularly likely to be serious, has long been proposed. There are in fact hints in a variety of contexts, despite popular belief, that a drunken person will suffer worse injury than a sober in an equivalent situation.

Alcohol is also likely to influence the subsequent course of events. In this connection, Brickley (1915) suggests that:

"Alcohol obscures the diagnosis; alcohol increases the danger of infection at the time of the accident; alcohol prevents adequate treatment; alcohol increases the danger of intercurrent complications; alcohol retards the process of repair; alcohol gives a poorer end result; alcohol increases the mortality in accidents."

Only detailed studies of the role of alcohol in scenarios of events, with attention both to precursors and the aftermath, will allow us to begin to disentangle the various possible roles for alcohol. And only well controlled or survey studies paying attention to a variety of possible factors besides alcohol will allow us to begin to specify the strength of alcohol's various roles.

Concerning whether removing alcohol would prevent a great number of accidents, there is a cautionary finding from Finland. Examining accidental injuries coming into an emergency department during a strike in the alcohol distribution system (which substantially decreased the amount of alcohol available, particularly to poor people and chronic heavy drinkers) and comparing patterns with accidental injuries in the same period for the preceding two years, Karaharu and Stjernvall (1976) found some substantial differences. During the strike there was a very significant decrease in the number of highly intoxicated patients. There were changes in several indicators probably linked to drinking such as a decrease in accidents occurring on Fridays and weekends, and in injuries due to assault. But, overall, the number of patients fell off by only 3% from the average of the two preceding years years. When injuries due to assault and battery are removed from the totals, it appears that the number of accidental injuries coming in to the clinic actually rose.

Table A-21

Empirical Studies

Accidental Deaths Across Casualties (Coroner's Studies)

Author, date, location	No. studied/eligibles	% alcohol present*	Alcohol measure	Sex	Restrictions Age	Time	Other	Years of collection
<u>United States</u>								
Phelps, 1911 U.S.	--	--	3 life insurance physician's estimates of AI	M	20-74	--	--	--
Brickley, 1915 Boston, Mass.	616/--	41	unspecified	--	adults	--	--	1911-1914
Joss, 1947 Minnesota	61	54 BAC > .05	BACs all cases	MF	--	--	--	1943
Gonzales, et al., 1948 New York	--	40	unspecified	--	--	--	violent	--
Spain et al., 1951 New York	246/--	27	liver or brain analysis all cases	MF	--	24 hrs.	consecutive	1949
Fisher, 1952 Baltimore and Boston	261/--	64	BACs unknown no.	--	--	--	--	1949 & 1950
Wilentz, 1953 New Jersey and New York	1,258/-- 658/--	16	unspecified	--	--	--	--	1933-1951 & 1948
Metropolitan Life, 1968 U.S.	847/--	16	unspecified	MF	15-64	--	home	1964-1965
Waller, 1972 Sacramento, Ca.	102/300	42 pos. BAC	BACs unknown no.	MF	over 14	6 hrs.	non-high-way; consecutive	1965-1967
Deasy et al., 1973 Wayne Co., Michigan	1,519/2,027	47 BAC > .01 29 BAC > .10	BACs all cases	--	--	--	violent only	1972
Haberman and Baden, 1974 New York, New York	1,000/--	38 35 BAC > .10	BACs on 44.5% sample; some autopsies; family/friend rpt on 100% sample	MF	over 17	--	trauma; consecutive	Feb-Apr 1972
Trunkey and Lin, 1974 San Francisco, Ca.	270/--	41 BAC > .10	BACs unknown no.	MF	--	--	trauma	1972
<u>Foreign</u>								
Hansen and Jentzch, 1956 Germany	2,133/--	30 pos. BAC	BACs 57% cases	--	--	--	--	--
Bowden et al., 1958 Australia	649/4,118	11 pos. BAC	BACs all cases	--	--	--	--	1951-1956
Cutler and Morrison, 1968 British Columbia	518/--	35 BAC > .01	BACs 47% sample; witness rpts on rest	MF	--	--	--	1968
Alha et al., 1974 Helsinki, Finland	1,498/--	37	BACs unknown no.	--	--	--	--	1971

*See Table A-2 for breakdown by casualty

Table A-22
 Empirical Studies
 Accidental Injuries Across Casualties (Emergency Room Studies)

Author, date, location	No. studied/eligibles	% alcohol present*	Alcohol measure	Sex	Restrictions Age	Time	Other	Years of collection
<u>United States</u>								
Kirkpatrick&Taubenhaus, 1967 Boston, Mass.	94/--	45 BAC<.01 37 BAC>.05	BACs all cases; some self-reports	MF	over 21	--	every 20th home accident	1966
Wechsler et al., 1969 Boston, Mass.	6,844/11,644	24 BAC>.01	BACs on 82%; interviews on all	MF	over 15	--	alive on arrival	1966-1967
<u>Foreign</u>								
Schumacher, 1923 Vienna, Austria	14,600/--	1.3	unspecified estimate	--	--	--	no Sept. cases; rest of year inc.	1920-1922
Hindmarsh, 1934 Sweden	386/--	32	BACs unknown no.	MF	over 15	6 hrs	--	1932
Besson and Redor, 1953 France	100/--	32 BAC>.10	BACs all cases	MF	--	--	consecu- tive; trauma	1952
Verhaege and Schodet, 1959 France	777/977	47 pos. BAC	BACs all cases	MF	adults	--	--	1956-1957
Mikheikin, 1963 Leningrad, U.S.S.R.	--	16	unspecified	--	--	--	--	--
Johnsen et al., 1966 Sweden	138/--	30 pos. BAC	BACs unknown no.	--	over 15	--	--	1965
Truchet et al., 1966 France	1,484/--	58 pos. BAC	BACS unknown no.	MF	adults	--	--	1957--
ImObersteg and Baumler, 1967 Sweden	328/--	19 pos. BAC	BACs unknown no.	MF	--	--	--	1965-1966
Reichel and Lammel, 1968 Germany	459/--	100	unspecified	MF	--	--	all un- der influ- ence of alc.	1963-1964
Gay et al., 1970 Melbourne, Australia	246/328	34 BAC<.01	BACs all cases	MF	18-65	--	alive on arrival	1969(?)
Kielholz et al., 1973 Switzerland	1,376/--	31 pos. BAC	BACs unknown no.	MF	--	--	--	1964-1970
Lahdenranta, 1973 Helsinki, Finland	902/--	8	unspecified	MF	--	--	home ac- cident or assault	1960-1962
Rydberg et al., 1973 Sweden	1,298/1,356	21 pos. BAC	BACs unknown no.	M	--	--	--	1963-1964
Honkanen et al., 1974 Helsinki, Finland	337/620	40 25 BAC>.15	BACs all cases	--	over 14	8 hrs.	--	1972
Honkanen and Visuri, 1976 ^c Helsinki, Finland	1,012/1,313	37 pos. BAC	BACs all cases	MF	over 14	4 days	natives	1972-1973
Honkanen and Ottelin, 1976 ^a Rural Finland	182/187	30 pos. BAC	BACs all cases	MF	adults	12 hrs.	consecu- tive	Mar-Apr 1974

*See Table A-3 for breakdown by casualty.

Alcoholics' Accidental Deaths Across Casualties

Author, date, location	# deaths /sample	Relative risk*	Comparative population	Alcohol measure	Restrictions			Follow-up period	Years exposure
					Sex	Age	Other		
<u>United States</u>									
Menge, 1950 U.S.	258/--	--	ins. policy holders	insurance policy classification (self-report)	MF	--	--	1931-48	76,658
Davies, 1965 U.S.	29/ 2,582	3.6	ins. policy holders	insurance policy classification (self-report)	MF	--	--	1940-62	12,000
Brenner, 1967 S.F. Bay Area, Ca.	44/ 1,343	5.8	age & sex specific, San Francisco, CA	treatment center diagnosis	MF	--	--	1954-61	7,289
Pell and D'Alonzo, 1973 Wilmington, Delaware	4/899	4.0	age,sex,payroll class,geography specific, DuPont Co.	company physician diagnosis	MF	--	--	1965-69	--
Schuckit&Gunderson, 1974 U.S. Navy and Marines	28/4755	--	age specific, U.S. Military	hospital diagnosis	M	--	Navy & Marines	1965-73	--
Choi, 1975 St. Louis	21/863	--	no comparison	hospital/treatment center diagnosis	MF	--	--	July 1969- June 1972	1-3 years per person
<u>Foreign</u>									
Dahlgren, 1951 Malmo City, Sweden	156/ 10,616	3.1	age,sex,mari- tal status,& residence speci- fic, Sweden	temperance board diagnosis	M	over 13	--	1939-47	--
Nørvig & Nielsen, 1956 Roskilde, Denmark	17/221	--	no comparison	hospital diagnosis	M	--	--	1948-1953	--
Sundby, 1967 Norway	--/ 1,722	--	age & sex specific, Oslo	hospital diagnosis	M	--	--	1925-62	34,951
Gillis, 1969 South Africa	--/802	--	age, sex, & race specific, South Africa	clinic diagnosis	MF	--	whites	1959-64	3,479
Schmidt & de Lint, 1969 Toronto, Canada	136/ 6,514	3.8	age & sex specific, Ontario	clinic diagnosis	MF	--	--	1951-64	41,149
Engeset and Idsøe, 1970 Norway	40/251	20	age & sex specific, Norway	unspecified	M	--	--	1955-66	--
Giffen, 1971 Canada	--/343	--	age & sex specific, Ontario	3 or more arrests for drunkennes/yr	M	--	--	1940-61	4,214
Schmidt & de Lint, 1972 Toronto, Canada	136/ 6,514	3.8	age & sex specific, Ontario	clinic diagnosis	MF	--	--	1951-64	41,149
Dijk, 1973 Broningen, the Netherlands	11/211	10	Netherlands	clinic diagnosis	M	--	--	1959-65	--
Nicholls et al., 1974 London, England	85/935	15.8	age & sex specific, England & Wales	hospital diagnosis	MF	--	--	1953-67	≈10,000
Medhus, 1975 Malmo, Sweden	12/83	--	age & sex specific,Sweden	treatment center diagnosis	F	--	--	1961-73	--
de Lint&Levinson, 1975 Toronto, Canada	12/154	--	age & sex specific, Ontario	hospital/treatment center diagnosis	MF	20- 74	--	Apr 1969 Apr 1974	751

*See Table A-8 for breakdown by casualty.

BIBLIOGRAPHY

Accidents -- General Introduction and Multi-Casualty Studies

(Coroner, Emergency Room and Alcoholic Studies)

- Alha, A.; Uotila, U. and Tamminen, V.
1974 "Oileuslääketieteellisissä ruumiinavauksissa todettu alkoholi." (Alcohol found in autopsies), Suomen Lääkärilehti, Vol. 29, pp. 3021-3024.
- Besson, R. and Redor, M.
1953 "Alcool et traumatismes. Etude de l'impregnation ethylique par dosage de l'alcool dans le sang chez cent blesses admis dans un service de chirurgie." La Presse Med., Vol. 61, p. 849, in Honkanen, 1976.
- Bowden, K.M.; Wilson, D.W. and Turner, L.K.
1958 "A survey of blood alcohol testing in Victoria (1951-1956)." Medical Journal of Australia, Vol. 2, pp. 13-15.
- Brenner, Berthold
1967 "Alcoholism and fatal accidents." Quarterly Journal of Studies on Alcohol, Vol. 38, September, pp. 517-528.
- Brenner, Berthold; Cisin, Ira H. and Newcomb, Carol
1966 "Drinking practices and accidental injuries." Presentation at session on Alcohol Use and Accidents of the Society for the Study of Social Problems, Miami, Florida, August 28.
- Brickley, W.J.
1915 "The relation of alcohol to accidents." Boston Medical and Surgical Journal, Vol. 172, pp. 744-747.
- Brown, Herbert R.
1959 The Sentimental Novel in America: 1789-1860. New York: Pageant Books.
- Bruun, Kettil, et al.
1975 Alcohol Control Policies in Public Health Perspective, Finland, Helsinki Finnish Foundation for Alcohol Studies.
- Cahalan, Don and Room, Robin
1974 Problem Drinking among American Men. New Brunswick, New Jersey: Rutgers Center of Alcohol Studies.
- Cahalan, Don; Cisin, Ira H.; and Crossley, Helen M.
1969 American Drinking Practices: A National Study of Drinking Behavior and Attitudes. New Brunswick, New Jersey: Rutgers Center of Alcohol Studies.
- Choi, Sei Young
1975 "Death in young alcoholics." Journal of Studies on Alcohol, Vol. 36, pp. 1224-1229.

- Cutler, R. and Morrison, N.
1971 "Sudden death: A Study of Characteristics of Victims and Events Leading to Sudden Death in British Columbia with Primary Emphasis on Apparent Alcohol Involvement and Indian Sudden Death." report by the Alcoholism Foundation of British Columbia, 70 pp.
- Dahlgren, K.G.
1951 "On death-rates and causes of death in alcohol addicts." Acta Psychiatrica & Neurologica Scandinavia, Vol. 26, pp. 297-311.
- Davies, Karl M.
1965 "The influence of alcohol on mortality." Proceedings of Home Office Life Insurance Underwriters Association, Vol 46, pp. 159-179.
- Deasy, Sean; Ruppert, Gerald and Nordmoe, Dennis
1973 County of Wayne 1972: Alcohol Related Violent Deaths. Report to Detroit Department of Health, Division of Alcoholism, Bureau of Substance Abuse, Michigan, May 8, 7 pp.
- De Lint, J. and Levinson, T.
1975 "Mortality among patients treated for alcoholism: A five-year follow-up." Canadian Medical Association Journal, Vol. 113, pp. 385-387.
- Demone, H.W. and Kasey, E.H.
1966 "Alcohol and non-motor vehicle injuries; literature review." Public Health Report, Washington, Vol. 81, pp. 585-590.
- Dijk, W.K. van and Dijk-Hoffeman, A. van
1973 "A follow-up study of 211 treated male alcoholic addicts." British Journal of Addiction, Vol. 68, No. 1, March, pp. 3-24.
- Engeset, A. and Idsøe, R.
1970 "Dødelighet blant alkoholmisbrukere." (Mortality among alcohol abusers) Alkoholspørsmålet, Vol. 22, pp. 1-8.
- Fisher, R.S.
1952 "Alcohol, accidents and crime." Current Med. Dig., Vol. 19, No. 6, pp. 37-41.
- Gay, T.J.; Coates, R.L; Coggins, G.L.; Alexander, K.D. and Nayman, J.
1970 "Blood alcohol concentrations upon admission to a hospital casualty department." Medical Journal of Australia, Vol. 2, Oct. 24, pp. 778-781.
- Gersuny, Carl
1976 "Making a Necessity of Virtue: Historical Data for Industrial Sociology." Paper presented at the Annual Meeting of the American Sociological Association, New York, September 3.
- Gillis, L.S.
1969 "The mortality rate and cause of death of treated chronic alcoholics." South African Medical Journal, Vol. 43, pp. 230-232, in Brun 1975.

- Giffen, P.J.; Oki, G. and Lambert, S.
1971 "The Chronic Drunkenness Offender: Ages and Causes of Death of the Chronic Drunkenness Offender." Alcoholism and Drug Addiction Research Foundation Substudy 1-11 & 16 & 24 & T & Ma-71, Toronto, in Brunn 1975.
- Gonzales; Vance and Halperin
1948 In Wilentz 1953.
- Haberman, Paul and Baden, Michael
1974 "Alcoholism and violent death." Quarterly Journal of Studies on Alcohol, Vol 35, March, pp. 221-231.
- Hansen, G. and Jentzsch, G.
1956 "Über die mitwirkung des alkohols bei gewaltsamen und natürlichen todesursachen." (On the contribution of alcohol to violent and natural causes of death) Dtsch. Gesundheitswes., Vol. II, pp. 1737-1745.
- Hindmarsh, J. and Linda, P.
1934 "Alkoholuntersuchungen bei unfallverletzten." Acta Chir Scand., Vol. 75, p. 198.
- Honkanen, Risto
1976 Alcohol Involvement in Accidents. University of Helsinki, Finland: Department of Public Health Science.
- Honkanen, Risto; Visuri, Timo and Hansson, Leena
1974 "Alkoholi ja tapaturmat." (Alcohol and accidents), Suomen Lääkärilehti, Vol. 29, pp. 2349-2352.
- Honkanen, Risto; Visuri, Timo and Kilpiö, J.
1975 "BAC's in accident victims." Annales Chirurgiae et Gynaecologiae, Vol. 64, pp. 365-368.
- Honkanen, R. and Ottelin, J.
1976(a) "Blood alcohol levels in injury victims at the emergency station of a rural central hospital." Annales Chirurgiae et Gynaecologiae, Vol. 65, pp. 282-286.
- Honkanen, R.; Ertama, L.; Kuosmanen, P.; Linnoila, M. and Visuri, T.
1976(b) "A case-control study on alcohol as a risk factor in pedestrian accidents: A preliminary report." Modern Problems of Pharmacopsychiatry, Vol. 11, pp. 1-5.
- Honkanen, R. and Visuri, T.
1976(c) "Blood alcohol levels in a series of injured patients with special reference to accident and type of injury." Ann. Chir. Gynaecol. Fenn., Vol. 65, pp. 287-294.
- Im Obersteg, J. and Bäumlner, J.
1967 "Unfälle unter der einwirkung von arzneimitteln und alkohol." Schweiz.Med. Wochenschr., Vol. 97, p. 1039.
- Ipsen, Johannes; Moore, Merrill and Alexander, Leo
1952 "Prevalence of alcoholism in the population and among suicides and accidents from poisoning 1938-1948." Quarterly Journal of Studies on Alcohol, Vol. 13, June, pp. 204-214.

- Jetter, W.W.
1938 "Studies in alcohol: I. The diagnosis of acute alcoholic intoxication by a correlation of clinical and chemical findings." American Journal of Medical Sciences, Vol. 196, pp. 475-487.
- Johnsen, C.; Linder, B. and Lorentzson, S.
1966 "Förekomst av alkoholpaverkade i ett kirurgiske akutklientel." (Incidence of alcohol-influenced cases in a series of surgical emergencies), Socialmed. T., Vol. 43, p. 103.
- Joss, G.
1947 "Contribution of alcohol to accident fatalities in Hennepin County during a One-year Period." Quarterly Journal of Studies on Alcohol, Vol. 7, pp. 588-595.
- Karaharu, E.O. and Stjernvall, L.
1974 "The alcohol factor in accidents." Injury, Vol. 6, pp. 67-69.
- Kerr, Norman
1894 Inebriety or Narcomania. 3rd edition, London: H.K. Lewis.
- Kielholz, P.; Battegay, R. and Mühlemann, R.
1973 "Alkohol und Verkehr." Schweiz. Med. Wochenshr., Vol 103, p. 21.
- Kirkpatrick, John R. and Taubenhaus, Leon J.
1967 "Blood alcohol levels of home-accident patients." Quarterly Journal of Studies on Alcohol, Vol 28, pp. 734-737.
- Lahdenranta, Uolevi
1973 "Kodin piirissä sattuneiden tapaturminen tarkastelua." (A survey on accidents that happen at home), Suomen Lääkärilehti, Vol. 28, pp. 1826-1832.
- Levine, Harry Gene
1977 "Colonial and Nineteenth Century American Thought about Liquor as a Cause of Crime and Accidents." Paper presented at the Annual Meetings for the Society for the Study of Social Problems, September. Social Research Group, E-48.
- Medhus, Asbjörn
1975 "Mortality among female alcoholics." Scand. J. Soc. Med., Vol. 3, pp. 111-115.
- Menge, Walter O.
1950 "Mortality experience among cases involving alcoholic habits." Proceedings of Home Office Life Underwriters Association, Vol. 31, pp. 70-93.
- Metropolitan Life Insurance
1968 "Drinking involved in home accidents, Company finds." Illinois Med. J., Vol. 133, pp. 423, 543.
- Mikheikin, V.
1963 "On the problem of the organization of hospital medical service for patients injured while in a state of alcohol intoxication." Sovet Zdravookhr, Vol. 22, pp. 34-36, in Demone, H.W. and Kasey, E.H., 1966.
- National Center for Health Statistics
1973 Impairments Due to Injury: United States, 1971. Vital Health Statistics -- Series 10, No. 87, DHEW Publication (HRA) 74-1514. Washington, D.C.: U.S. Government Printing Office.

National Center for Health Statistics

1974 Current Estimates from the Health Interview Survey: United States, 1973. Vital and Health Statistics -- Series 10, No. 95, DHEW Publication (HRA) 75-1522. Washington, D.C., Government Printing Office.

National Center for Health Statistics

1975 Selected Vital and Health Statistics in Poverty and Nonpoverty Areas of 19 Large Cities: United States, 1969-1971. Vital and Health Statistics -- Series 21, No. 26, DHEW Publication (HRA) 76-1904. Washington, D.C., Government Printing Office.

National Center for Health Statistics

1976 Persons Injured and Disability Days by Detailed Type and Class of Accident: United States, 1971-1972. Vital and Health Statistics -- Series 10, No. 105, DHEW Publication (HRA) 76-1532, Washington, D.C., Government Printing Office.

National Safety Council

1976 Accident Facts: 1976 Edition. Chicago, Illinois: National Safety Council.

Nicholls, Peter; Edwards, Griffith and Kyle, Elspeth

1974 "Alcoholics admitted to 4 hospitals in England: II. General and cause-specific mortality." Quarterly Journal of Studies on Alcohol, Vol. 35, pp. 841-855.

Nørvig, J. and Nielson, B.

1956 "A follow-up study of 221 alcohol addicts in Denmark." Quarterly Journal of Studies on Alcohol, Vol. 17, pp. 633-642.

O'Donnell, J; Voss, H.; Clayton, R.; Slatin, G. and Room R.

1976 Young Men and Drugs: A Nationwide Survey. Washington, D.C., NIDA Research Monograph No. 5.

Pell, Sidney and D'Alonzo, C.A.

1973 "A five-year mortality study of alcoholics." J. Occup. Med., Vol. 15, pp. 120-125.

Phelps, Edward Bunnell

1911 The Mortality of Alcohol. NY: Thrift Publishing Co., (Reprint from The American Underwriter Magazine & Insurance Review, Vol. 36, No. 1, September 1911).

Reichel, J. and Lammel, H.

1968 "Alkoholbedingte unfälle." (Accidents due to alcohol), Z. ärztliche Fortbild., Jena, Vol. 62. pp. 1309-1312.

Rydberg, U; Bjerver, K. and Goldberg, L.

1973 "The alcohol factor in a surgical emergency unit." Acta Med. Leg. Soc., (Liege), Vol. 22, pp. 71, in Honkanen, R. 1976.

Schmidt, Wolfgang and de Lint, Jan

1969 "Mortality experiences of male and female alcoholic patients." Quart. J. Stud. Alc., Vol. 30, pp. 112-118.

Schmidt, Wolfgang and de Lint, Jan

1972 "Causes of death of alcoholics." QJSA, Vol. 33, March, pp. 171-185.

- Schuckit, Marc A. and Gunderson, E.K. Eric
1974 "Deaths among young alcoholics in the US naval service." QJSA, Vol. 35, pp. 856-862.
- Schumacher, Dr.
1923 "Alcohol as a cause of accidents." JAMA, Vol. 81, pp. 2128-2129.
- Spain, David M.; Bradess, Victoria A. and Eggston, Andrew A.
1951 "Alcohol and violent death -- A one-year study of consecutive cases in a representative community." JAMA, Vol. 146, pp. 334-335.
- Suchman, Edward A.
1970 "Accidents and social deviance." Journal of Health and Social Behavior, Vol. II, pp. 4-15.
- Sundby, P.
1967 Alcoholism and Mortality. Oslo, Norway: Universitetsforlaget.
- Truchet, P.; Jacquemond, D. and Benazet, L.
1966 "Etude statistique de l'impregnation alcoolique des traumatisés admis dans un service de chirurgie." Lyon Med., Vol. 215, p. 903.
- Trunkey, Donald D. and Lim, Robert C.
1974 "Analysis of 425 consecutive victims of trauma: An autopsy study." Journal of the American College of Emergency Physicians, Vol. 3, No. 6, pp. 368-371.
- Verhaege, A. and Schodet, R.
1959 "Considerations sur les dosages d'alcoolemie par prelevement systematique chez les blessés." Lille Med., Vol. 4, p. 866.
- Waller, Julian A.
1972 "Non-highway injury fatalities: I. The roles of alcohol and problem drinking, drugs, and medical impairment." Journal of Chronic Diseases, Vol. 25, pp. 33-45.
- Wechsler, Henry; Kasey, E.H.; Thum, D. and Demone, H.W.
1969 "Alcohol level and home accidents." Public Health Reports, Vol. 84, December, pp. 1043-1050.
- Wilentz, W.C.
1953 "The alcohol factor in violent deaths." American Practit. Dig. Treat., Vol. 4, pp. 21-24.
- Zylman, Richard
1976 Alcohol Risk Factors in the Recreational Population. Presented at The Public Safety Session on Alcohol and Recreation. National Safety Congress, Chicago, Illinois.

BIBLIOGRAPHY

Accidents -- Industrial

- Brenner, Berthold
1967 "Alcoholism and fatal accidents." Quarterly Journal of Studies on Alcohol, Vol. 38, September, pp. 517-528.
- Boos, W.F.
1913 "Relations of alcohol to industrial and to occupational diseases." International Congress of Hygiene Demogr., Vol. 15, pp. 829 - 836.
- Cavalié, B.
1956 "Effects of chronic alcoholism on morbidity and industrial accidents." Arch Mal Prof, Vol. 17, pp. 98-102, in Demone, H.W. and Kasey, E.H., 1966.
- Collis, Edgar L.
1922 "Discussion on alcohol as a beverage and its relation to certain social problems: Alcohol and industrial efficiency." British Medical Journal, Vol. 2, pp. 244-248.
- Davis, Morris
1976 Associate Director of the Labor Occupational Health Program, Berkeley, California. Personal Communication.
- Demone, Harold W. and Kasey, Elizabeth H.
1965 "Alcoholic beverages -- Use and misuse as a contributing factor in nonmotor vehicle accidents." From Conference Proceedings, Alcohol and Accidental Injury, U.S. D.H.E.W., Government Printing Office.
- Demone, H.W. and Kasey, E.H.
1966 "Alcohol and nonmotor vehicle injuries; literature review." Publ. Hlth Rep., Wash., Vol. 81, pp. 585-590.
- German Studies
1890s, In Boos 1913.
- Guttstadt
1907 Schweizer Abstinenzblatt, Vol VI, in Boos 1913.
- Hansen, G. and Jentzsch, G.
1956 "On the contribution of alcohol to violent and natural causes of death." Deutsch Gesundh, Vol. II, pp. 1737-1745, in Demone and Kasey, 1966.

Hitz, Danielle

1973 "Drunken sailors and others: Drinking problems in specific occupations." Quarterly Journal of Studies on Alcohol, Vol. 34, pp. 496-505.

Hollitscher

Intern. Monatsschr. z. Erforsch. d. Alkoholismus, etc., Vol. XX.
p. 242, in Boos 1913.

Jellinek, E.M.

1947 "What does alcoholism cost?" Health, Mountain view, CA., Vol. 14,
No. 13, October, pp. 29-30.

Lahelma, Eero

1973a "Työolosuhteet, työturvallisuus ja alkoholi." (Working conditions safety and alcohol), Alkoholipolitiikka, Vol. 38: pp. 155-159.

Lahelma, Eero

1973b "Työpikkakuolemat ja alkoholi." (Fatal industrial accidents and alcohol), Alkoholipolitiikka, Vol. 38, pp. 194-199.

Lahelma, Eero

1974 "Päihtymyksen vaikutus työtapaturman sattumiseen" (The effect of intoxication on industrial accidents), Alkoholikysymys, Vol. 42, pp. 31-39.

Lang, Gordon E. and Mueller, Rudolf G.

1976 "Ethanol Levels in Burn Patients." Wisconsin Med J., Vol. 75, pp. 55-56.

Ledermann, S.

1956 "Les accidents du travail." In Alcool, alcoolisme, alcoolisation: Données scientifiques de caractère physiologique, économique, et social, Presses Universitaires de France, Paris, pp. 207-219, in Demone, H.W. and Kasey, E.H., 1966.

Ledermann, S. and Metz, B.

1960 "Les accidents du travail et l'alcool" (Industrial accidents and alcohol), Population, Paris, Vol. 15, pp. 301-316.

Levine, Harry-Gene

1977 "Colonial and Nineteenth Century American Thought about Liquor as a Cause of Crime and Accidents." Paper presented at the Annual Meetings of the Society for the Study of Social Problems, September. Social Research Group, Berkeley, E-48.

Lundén, Signe

1958 "Sambandet mellan alkoholvanor och olycksfall i arbete inom tyngre verkstadsindustri." (The relation between drinking habits and industrial accidents in heavy machine industry), Alkoholfrågan, pp. 366-371.

Metz, B. and Marcoux, F.

1960 "Alcoolisation et accidents du travail" (Alcoholization and industrial accidents), Arch Mal prof, Vol. 21, pp. 750-752.

Morice, A.

1953 "Survey on the role of chronic alcoholism in the causation of industrial accidents." Bull. Acad. Nat. Med., Vol. 137, pp. 378-382.

Myers, G.

1915 "A study of the causes of industrial accidents." Amer. Statis. Ass. Quart., Vol. 14, pp. 672-694, in Demone and Kasey, 1966.

National Safety Council

1976 Accident Facts. Chicago, Ill.: National Safety Council.

Naeve, W.

1959 "Alcohol as a cause of fatal industrial accidents in Hamburg's harbor and industrial districts." Zbl Arbeitsmed, Vol. 9, pp. 90-91, in Demone 1966.

Naeve, W., Brinkmann, B. and Janssen, W.

1973 "Alkohol und Betriebsunfall; gerichtsmedizinischer Beitrag zur sozialmedizinischen Bedeutung alkoholbedingter Betriebsunfälle." (Alcohol and industrial accidents; contribution of forensic medicine to the sociomedical significance of alcohol-induced industrial accidents), Beitr. Gerichtl. Med., Vol. 30, pp. 317-323.

Observer and Maxwell, Milton A.

1959 "A study of absenteeism, accidents, and sickness payments in problem drinkers in one industry." Quart. J. Stud. Alc., Vol. 20, pp. 302-312.

Paproth, Hans

1928 Alkohol und Unfall (Alcohol and Accidents). Reichsarbeitsblatt 8:23 (August 15), III, 153-157.

Roman, Paul and Trice, Harrison M.

1972 "Deviance and work: The influence of alcohol and drugs on job behaviors." Reviews on Environmental Health, 1:1, pp. 9-51.

Room, Robin and Roizen, Ron

1973 "Some notes on the study of drinking contexts." The Drinking and Drug Practices Surveyor, No. 8, pp. 25-33.

Sadoun, Roland; Lolli, Giorgie and Silverman, Milton

1965 Drinking in French Culture. New Brunswick, N.J.: Rutgers Center of Alcohol Studies.

Stivers, Richard

1976 A Hair of the Dog. University Park, PA.: Penn. State University Press.

Timberlake, James H.

1963 Prohibition and the Progressive Movement 1900-1920. Cambridge: Harvard University Press. Reprinted 1970, New York: Atheneum.

Trice, Harrison M.

1957 "Work accidents and the problem drinker." I.L.R. Research, 3:2, pp. 2-6 (March).

1962 "The job behavior of problem drinkers." Pp. 493-510 in D.J. Pittman and C.R. Snyder, eds., Society, Culture and Drinking Patterns. New York: John Wiley.

1965 a "Alcoholic employees: A comparison of psychotic, neurotic, and "Normal" personnel." J. Occup. Med. 7:3 (March) pp. 94-99.

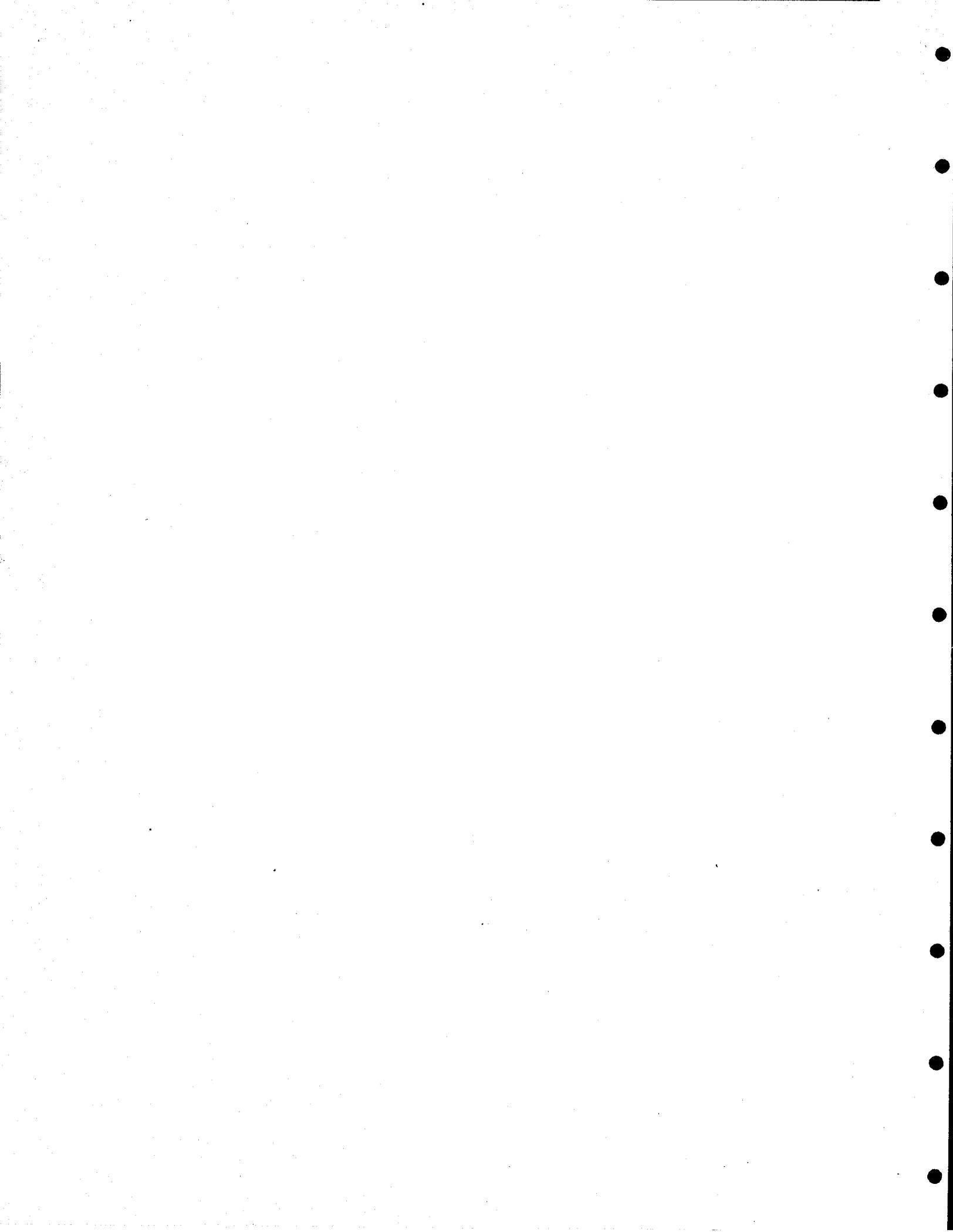
1965b "Reaction of supervisors to emotionally disturbed employees." J. Occup. Med. 7:5 (May) pp. 177-188.

Vernon, H.M.

1936 "Accidents and their prevention." Cambridge University Press, New York, pp. 70-74, in Demone, H.W. and Kasey, E.H., 1966.

Wolkenberg, Robert C., Gold, Calman and Tichauer, Erwin

1975 "Delayed effects of acute alcoholic intoxication on performance with reference to work safety." Journal of Safety Research, Vol. 7, No. 3, pp. 104-118.



BIBLIOGRAPHY

Accidents -- Aviation

AOPA

1965 "General aviation safety." AOPA Pilot, in Gibbons et al., 1967.

Billings, C.E.; Wick, R.L.; Gerke, R.J. and Chase, R.C.

1973 "Effects of ethyl alcohol on pilot performance." Aerospace Medicine, Vol. 44, pp. 379-382.

Davis, Gustave L.

1968 "Alcohol and military aviation fatalities." Aerospace Medicine, Vol. 39, pp. 869-872.

Davis, Gustave L.

1973 "Postmortem alcohol analyses of general aviation pilot fatalities, Armed Forces Institute of Pathology, 1962-1967." Aerospace Medicine, Vol. 44, pp. 80-83.

Gibbons, Harry L.; Ellis, John W., Jr. and Plechus, Judith L.

1967 "Analysis of medical factors in fatal aircraft accidents in 1965." Texas Medicine, Vol. 63, pp. 64-68.

Gibbons, Harry L. and Plechus, Judith L.

1965 "Analysis of medical factors in fatal aircraft accidents." Texas State Journal of Medicine, Vol. 61, pp. 667-671.

Harper, Charles R. and Albers, William R.

1964 "Alcohol and general aviation accidents." Aerospace Medicine, Vol. 35, pp. 462-464.

Heise, H.

1964 "Drugs -- alcohol -- and flying." The Flying Physician, Vol. 8, pp. 11-15, in Mohler, 1966.

Lacefield, Delbert J.

1975 "Alcohol continues to play big part in plane crashes." JAMA, Vol. 233, p. 405.

MacFarland, R.A.

1953 Human Factors in Air Transportation: Occupational Health and Safety. New York: McGraw-Hill Book Co., Inc., pp. 292-304.

Mohler, Stanley, R.

1966 "Recent findings on impairment of airmanship by alcohol." Office of Aviation Medicine Report, Federal Aviation Agency, No. AM 66-29.

Mohler, Stanley R.; Berner, William H. and Goldbaum, Leo R.

1968 "Alcohol question in aircraft accident investigation." Aerospace Medicine, Vol. 39, pp. 1228-1230.

Newman, Henry W.

1949 "Effects of altitude on alcohol tolerance." QJSA, Vol. 10, pp. 398-403.

Ryan, Leonard C. and Mohler, Stanley R.

1972 "Intoxicating liquor and the general aviation pilot in 1971." Aerospace Medicine, Vol. 43, pp. 1024-1026.

Smith, Paul W.; Lacefield, Delbert J. and Crane, Charles R.

1970 "Toxicological findings in aircraft accident investigation." Aerospace Medicine, Vol. 41, pp. 760-762.

Underwood Ground, K. E.

1975 "Joint committee on aviation pathology: X Alcohol associated with fatal light aircraft accidents, United Kingdom--1964-1973." Aviation, Space, and Environmental Medicine, Vol. 46, pp. 1275-1279.

Zeller, Anchar F.

1975 "Joint Committee on aviation pathology: IX Alcohol and other drugs in aircraft accidents." Aviation, Space, and Environmental Medicine, Vol. 46, pp. 1271-1274.

BIBLIOGRAPHY

Accidents -- Drowning

- Adams, Anthony I.
1966 "The descriptive epidemiology of drowning accidents." Med. J. Australia, Vol. 2, pp. 1257-1261.
- Alha, A.; Hirvonen, J. and Lehti, H.
1970 "Hukkumiskuolemat ja niiden tausta Suomessa vuonna 1967." (Death by drowning and their background in Finland in 1967), Suomen Lääkärilehti, Vol. 25, pp. 1630-1637.
- Arner, Oddvar
1970 Dødsulykker blant sjømenn. (Fatal accidents among sailors), Oslo: State Institute for Alcohol Studies, 242 p.
- Arner, Oddvar
1973 "The role of alcohol in fatal accidents among seamen." British Journal of Addictions, Vol. 68, pp. 185-189.
- Cutler, R.; Morrison, N.
1971 "Sudden Death: A Study of Characteristics of Victims and Events Leading to Sudden Death in British Columbia with Primary Emphasis on Apparent Alcohol Involvement and Indian Sudden Death." Report by the Alcoholism Foundation of British Columbia, 70 pp.
- Dietz, Park and Baker, Susan P.
1974 "Drowning: epidemiology and prevention." Amer. Journal of Public Health, Vol. 64, pp. 303-312.
- Giertsen, J. Chr.
1970 "Drowning while under the influence of alcohol." Med. Sci. Law, Vol. 10, pp. 216-219.
- Hirvonen, J. and Ojala, K.
1973 "Analysis över drunkningsolyckor i Uleåborgs Län 1969-1972". (Analysis of drownings in the Oulu province in 1969-1972), Nordisk Rättmedicinsk Förhandlingar (Lund.), p. 253, in Honkanen 1976.
- Honkanen, R.
1976 Alcohol Involvement in Accidents. University of Helsinki, Finland: Department of Public Health Science.
- Jaäskeläinen, A. J.
1969 "Hukkumiskuolemat ja alkoholi" (Drownings and alcohol), Alkoholipolitiikka, Vol. 34, pp. 127-131.
- Naeve, W.
1976 "Bedeutung des alkohols bei tödlichen unfällen an bord und im hafen." (The role of alcohol in fatal accidents on shipboard and in port), Blutalkohol, Vol. 13, pp. 27-38.

National Safety Council

1976 Accident Facts. Chicago, Ill.: National Safety Council.

Plueckhahn, V.D.

1972 "The aetiology of 134 deaths due to drowning in Geelong during the years 1957 to 1971." The Med. J. of Australia, Vol. 2, pp. 1183-1187.

Press, Edward; Walker, James and Crawford, Isabelle.

1968 "An Interstate drowning study" American Journal of Public Health, Vol. 58, pp. 2275-2289.

Stiehl, C.

1975 "Final Report: Alcohol and Pleasure Boat Operators" U.S. Department of Transportation, Coast Guard, 25p.

Stjernvall, Leo

1969 "Alkohol och drunkningsolyckor" (Alcohol and drownings), Nordisk Medicin, Vol. 82, pp. 830-831.

Zylman, Richard

1976 Alcohol Risk Factors in the Recreational Population. Presented at The Public Safety Session on Alcohol and Recreation. National Safety Congress, Chicago, Illinois.

BIBLIOGRAPHY

Accidents -- Fire and Burns

- Berl, Walter and Halpin, Byron
1976 "Fire-related fatalities: An analysis of their demography, physical origins, and medical causes." For presentation at the Symposium on Fire Standards and Safety, National Bureau of Standards, Gaithersburg, Md., April 5-6.
- Cahalan, Don; Cisin, Ira H. and Crossley, Helen M.
1969 American Drinking Practices: A National Study of Drinking Behavior and Attitudes. New Brunswick, New Jersey: Rutgers Center of Alcohol Studies.
- Crikelair, George F.; Symonds, Francis C.; Ollstein, Ronald N. and Kirsner, Amy I.
1968 "Burn causation: Its many sides." The Journal of Trauma, Vol. 8, pp. 572-582.
- Haberman, Paul and Baden, Michael
1974 "Alcoholism and violent death." Quarterly Journal of Studies on Alcohol, Vol. 35, pp. 221-231.
- Halpin, Byron; Schultz, A.G.; Radford, E.P.; Fisher, R.A., Schweda, P.; Spitz, W. and Fristom, G.A.
1973 "An in-depth fire casualty study." Presented at NFPA First European Fire Conference, Geneva, Switzerland, October 15-17.
- Halpin, Byron M.; Radford, Edward P.; Fisher, Russel and Caplan, Yale
1975 "A fire fatality study." Fire Journal, Vol. 5, pp. 11-13.
- Halpin, Byron; Fisher, R.S. and Caplan, Y.G.
1976 "Fire fatality study." Presented at International Symposium on Toxicity and Physiology of Combustion Products, University of Utah, March 22-26.
- Hitz, Danielle
1971 "Drunken sailors and others: Drinking problems in specific occupations." Quarterly Journal of Studies on Alcohol, Vol. 34, pp. 496-505.
- Hollis, W. Slater
1973 "Drinking: Its part in fire deaths." Fire Journal, Vol 5, pp. 10-13.
- Hollis, W. Slater
1974 "Fire deaths and drinking." Alcohol Health and Research World, Summer, pp. 8-9.
- Hurley, W. and Monahan, T.M.
1969 "Arson: The criminal and the crime." British Journal of Criminology, Vol. 9, pp. 4-21.

- Lang, Gordon E. and Mueller, Rudolph G.
1976 "Ethanol levels in burn patients." Wisconsin Med. J., Vol. 75,
pp. 55-56.
- MacArthur, John D. and Moore, Francis D.
1975 "Epidemiology of burns: The burn-prone patient." JAMA, Vol. 231,
pp. 259-263.
- Metropolitan Life Insurance
1967 Statistical Bulletin.
- de Moulin, D.
1975 "Spontaneous combustion. An odd chapter in the history of burns."
Arch. Chir. Neerl., Vol. 27, No. 4, pp. 223-7.
- National Safety Council
1976 Accident Facts. Chicago, Ill.: National Safety Council.
- NFPA Fire Record Dept. Study
1969 "Single fatality fire." Fire Journal, Vol. 63, No. 1, pp. 34-35.
- Ottoson, John
1974 "Human contribution to fire origins." Fire Journal, Vol. 68,
No. 5, July, pp. 19-22.
- United States Department of Justice, Law Enforcement Assistance Administration,
National Criminal Justice Information and Statistics Service
1974 Analysis by Social Research Group, Berkeley, California.
- Virkkunen, M. and Alha, A.
1969 "Tulipalo-ja häkäkuolemantapaukset Suomessa 1967" (Deaths caused by
fire or carbon monoxide in 1967 in Finland), Suomen Lääkärilehti,
Vol. 24, pp. 1213-1221.

BIBLIOGRAPHY

Accidents -- Falls

Amann, E,

1961 "Cerebra-cranial injury and alcoholism." Zbl ges Neurol Psychiat.
Vol. 159, P. 352 in Demone, H.W. and Kasey, E.H., 1966.

Galbraith, S.; Murray, W.R.; Patel, A.R. and Knill-Jones, R. (Jennett, W.B.)

1975 "The relationship between alcohol and head injury and its effect on the
conscious level." British Journal of Surgery, Vol. 62, p. 152.

National Safety Council

1976 Accident Facts. Chicago, Ill.: National Safety Council.

NIAAA

1974 Alcohol and Health: New Knowledge. Washington, D.C.: U.S. Government
Printing Office.

Teasdale, Graham and Jennett, Bryan

1974 "Assessment of coma and impaired consciousness." Lancet, Vol. 2,
pp. 81-84.

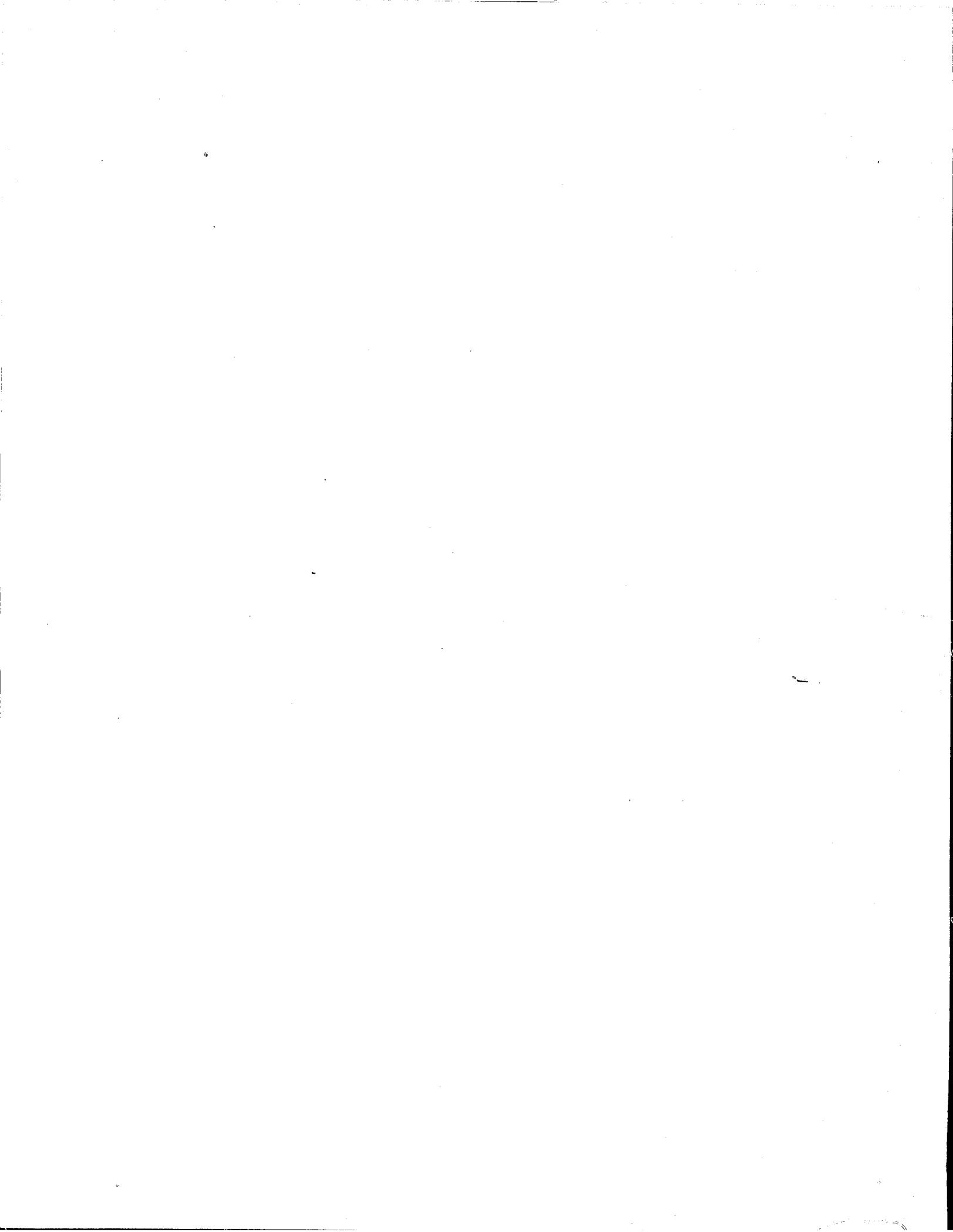
Waller, Julian A.

1973 "Falls among the Elderly -- Human and Environmental Factors."
Department of Epidemiology and Environmental Health, University of Vermont.

BIBLIOGRAPHY

Accidents -- "Other"

- Alha, Anitti and Korte, Taimi
1971 "Myrkytyskuolemat 1968-1970." (Deaths by poisoning 1968-1970), Suomen Lääkärilehti. Vol. 26, pp. 1311-1315.
- Alha, A. and Korte, T.
1976 "Myrkytyskuolemien kehitys maassamme." (The development of deaths by poisoning in Finland), Suomen Lääkärilehti, Vol. 31, pp. 1381-1384.
- Fatteh, A. and Hayes, B.
1974 "Poisons that killed: An analysis of 300 cases." North Carolina Medical Journal, Vol. 35, pp. 227-229.
- Fock, G. and Kyösolä, K.
1972 "Alkoholi ja paleltumat." (Alcohol and frost injuries), Sosiaalilääketieteellinen Aikakauslehti, Vol. 10, pp. 32-34.
- Haugen, Roger
1971 "Café coronary: Role of alcohol and asphyxiation due to food particles." National Safety Congress Transactions, Vol. 28, pp. 26-27.
- Helin, I.
1972 "Intoxikationer med alkohol och läkemedel bland tonåringar i Malmö." (Poisonings with alcohol and drugs among teenagers in Malmö), Läkartidningen, Vol. 69, pp. 5095-5100.
- LeGarde, John and Hudson, Page
1975 "Accidental deaths with farm machinery -- North Carolina, 1974." Office of the Chief Medical Examiner, North Carolina Department of Human Resources, Carolina Forensic Bulletin, Vol. 2, pp. 1-5.
- Mongé, J.J. and Reuter, N.F.
1972 "Snowmobiling injuries." Arch. Surg., Chicago, Vol. 105, pp. 188-191.
- National Safety Council
1976 Accident Facts. Chicago, Illinois: National Safety Council.
- Waller, Julian A. and Lamborn, Kathleen R.
"Snowmobiling: Characteristics of Owners, Patterns of Use, and Injuries." Department of Epidemiology and Environmental Health, University of Vermont, Burlington, Vermont.
- Weyman, A.E.; Greenbaum, D.M. and Grace, W.J.
1974 "Accidental hypothermia in an alcoholic population." Am. J. Med., Vol. 56, No. 1, pp. 13-21.



50637

CHAPTER THREE

ALCOHOL AND TRAFFIC

by

Tracy Cameron

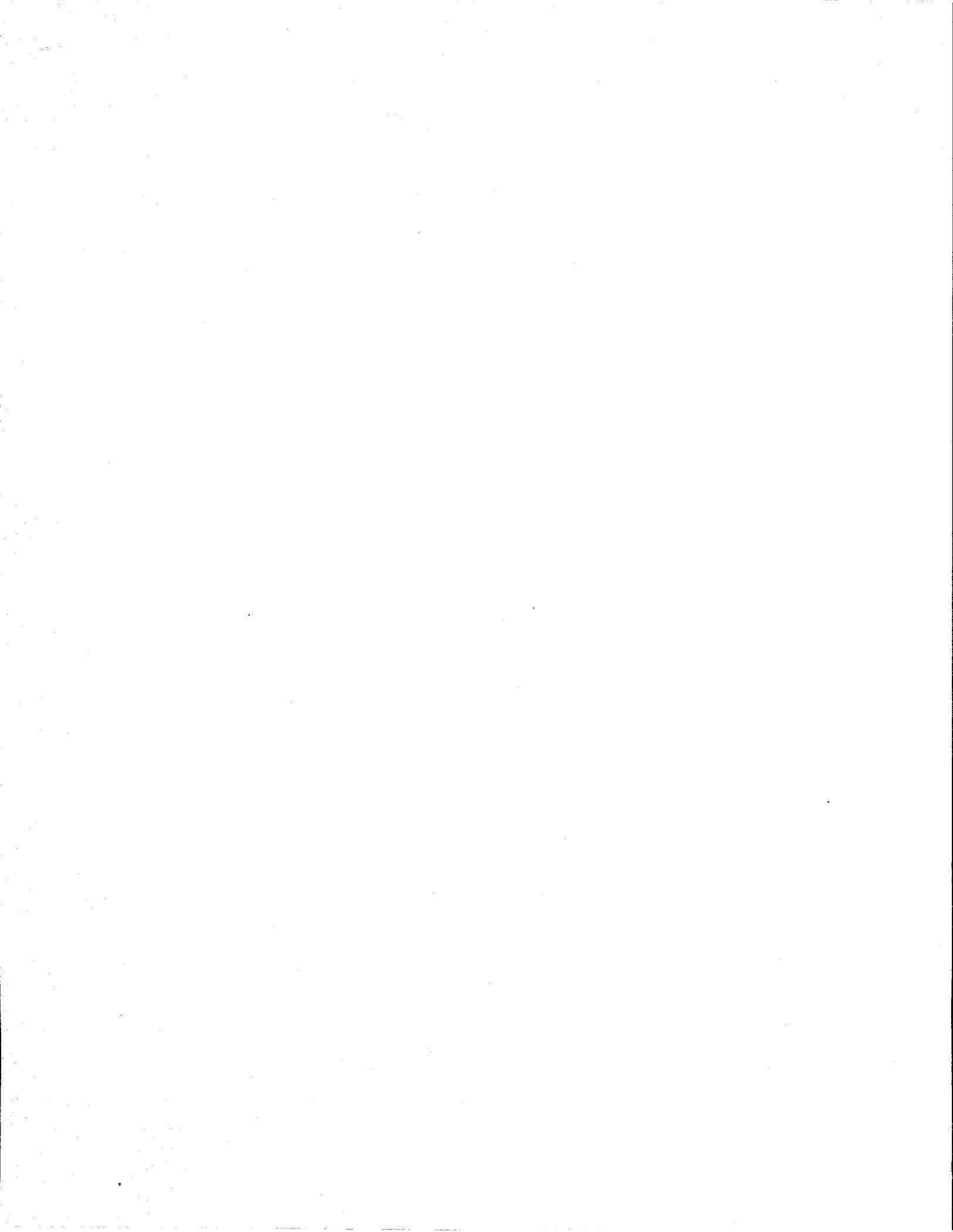


TABLE OF CONTENTS

	<u>Page</u>
I. Introduction	123
II. Blood Alcohol Level in the Event	129
A. Patterning and Prevalence of Alcohol in Traffic Crashes: Uncontrolled Studies	129
1. Types of Accidents	130
2. Time of Day and Day of Week	142
3. Demographic Factors	158
4. Methodological Constraints	167
B. The Relative Probability or Risk of Accident-Involvement	170
1. Rationale for Controlled Studies	170
2. Relative Risk as a Function of BAC	175
3. Relative Risk Over Time of Day	184
4. Relative Risk as a Function of Demographic Factors	186
5. Relative Risk as a Joint Function of BAC and Demographic Factors	189
III. Drinking Patterns, Traffic Accidents and Violations	192
A. Overall Involvement in Traffic Accidents and Violations	193
1. Drinking Frequency	193
2. Quantity of Alcoholic Beverages Consumed	198
3. Quantity/Frequency Patterns of Drinking Behavior	199
4. Summary	208
B. Alcohol-Related Driving Patterns, Accidents and Violations	210
1. Frequency of Driving After Drinking	210
2. The Patterning of Alcohol-Related and Non-Alcohol-Related Accidents and Violations by Drinking Frequency	215
3. The Patterning of Alcohol-Related and Non-Alcohol-Related Accidents and Violations by Quantity Measures of Drinking Behavior	222
4. The Patterning of Alcohol-Related and Non-Alcohol-Related Accidents and Violations by Quantity/Frequency Measures of Drinking Behavior	223
5. Summary	225
IV. The Role of the Problem Drinker or Alcoholic in Traffic Events	226
A. Empirical and Theoretical Focus of Research in This Area	226

TABLE OF CONTENTS
(continued)

	<u>Page</u>
B. Empirical Research	227
1. Types of Traffic Events	228
2. Indicators of Problem Drinking and Alcoholism	232
3. Data from Controlled Studies	238
4. Summary	240
V. Driving Records of Alcoholics and DWI Offenders	242
A. Alcoholics	242
1. Methodological Constraints	245
2. Personality and Psychological Factors	247
B. DWI Offenders	249
VI. Conclusion	256
Footnotes	259
Bibliography	261

ALCOHOL AND TRAFFIC

I. INTRODUCTION

By most standards traffic crashes¹ constitute a major social problem. They are the greatest cause of violent death in the U.S., producing more fatalities each year than any other type of accident (industrial, home, or other transportation) and more deaths than the combined total produced by suicide and homicide. Traffic crash events, moreover, have high lethality -- other sorts of accidents, though they occur far more frequently, are much less often fatal. It is thought that the total yearly costs of crashes to the U.S. economy is on the order of six and one-half billion dollars.

Given these sorts of magnitudes it is not surprising that the study of traffic crashes has spawned a huge and diverse research literature. In the last 20 years or so one of the most common themes to be found in the literature is the idea that alcohol is responsible for a substantial portion of the serious crash events in the United States. Concern over the role of alcohol in traffic crashes began virtually with the beginnings of automobile travel in this country ("Motor Wagons," 1904), but formal studies only began in the 1930s. The period surrounding the repeal of National Prohibition gave rise to a brief flurry of alcohol-traffic research -- for the most part motivated by a concern that relegalized drinking might be followed by a sharp rise in drunk driving and alcohol-related accidents.

But in spite of these early studies, alcohol-traffic research had a slow beginning. It was not until the late 1950s and the decade of the 1960s that the field experienced a dramatic and even exponential growth rate in published studies. Presently, researchers working in this field have come from several social sciences, from engineering, from institutions for research on alcoholism, from

state and federal departments of traffic safety, from coroner's offices, from police departments, and from the medical and legal professions.

The greatest bulk of alcohol-traffic research belongs to one of two broad research traditions: either the "event-centered" tradition of traffic safety researchers or the "person-centered" tradition of the modern alcoholism movement. The "event-centered" tradition focussed on the role of blood alcohol level in traffic crashes. It asked such questions as: (1) How frequently does one or another person involved in a crash have a positive or elevated level of blood alcohol? (2) To what extent is blood alcohol level responsible for traffic accidents? (3) How much blood alcohol is necessary before the risk of an accident is significantly increased? and (4) What is the shape of the relation between accident-risk, on the one hand, and blood alcohol concentration, on the other? This research tradition saw blood alcohol level as the focal independent variable in the explanation of automobile crashes.

The "person-centered" tradition of the modern alcoholism movement, on the other hand, moved the focus of research away from blood alcohol level. By the mid-1950s, several researchers focussed on the drinking driver per se rather than on the role of alcohol in the crash. It was their contention that a large part of alcohol-related traffic crashes could be attributed to the alcoholic or the problem drinker. The territory encompassed by the alcohol variable in this research tradition was expanded to cover not only alcohol use at the time of the crash, but also alcohol use in general, and related personal, social and financial problems in the personal histories of drivers involved in crashes.

Research on the role of the alcoholic or problem drinker in traffic crashes and violations was conducted from two methodological orientations. The first orientation, although person-centered in its theoretical approach to drinking and driving problems, remained event-centered in its sample design. It relied

on samples of accident-involved persons or persons convicted of drunken or impaired driving (DWI) and then sought to determine what proportion of these persons could be identified as alcoholics or problem drinkers.

The second type of study, focusing on the role of the alcoholic or problem drinker in traffic crashes and violations, relied on samples of hospitalized or clinic alcoholics as well as on accident-involved alcoholics identified by researchers from larger groups of drivers involved in traffic crashes. The driving records of these alcoholics were analyzed for numbers of previous accidents and violations and then were compared with the driving records of non-alcoholics or with the general driving population. Similar studies analyzed the driving records of DWI offenders.

In recent years the person-centered research tradition has expanded to include not only the role of the problem drinker and the DWI offender in traffic crashes, but also the role of the young driver. A disproportionately large number of traffic crashes involve persons aged 16-25. Explanatory theories have recognized this reality by noting the inexperience of this group both as drivers and as drinkers. A few researchers have looked for personality factors such as hostility and alienation to play a significant role in accounting for the large numbers of crashes and violations of younger drivers.

This focus on the young driver, the DWI offender, and the problem drinker reflects a continuing concern in the alcohol traffic field with identifying various "high risk" groups of drivers -- those that are characterized by over-involvement in traffic crashes and violations.

Organization of the Paper

This report's organization roughly follows these divisions in the epidemiological literatures. First of all, Section II describes event-centered research; research in the person-centered tradition is taken up in Sections III, IV, and V. Thus, the report can be thought of as having two halves reflecting that major division.

Within Section II the discussion of alcohol in the event is itself divided into two broad sections: uncontrolled and controlled studies. Uncontrolled studies for the most part speak to an "extensiveness" question -- they tell us how often or how frequently alcohol is present in crash events. Thus they provide a fundamental but at the same time only a purely descriptive sort of knowledge. These studies provide information on the possible outer boundary of alcohol's involvement in traffic crashes, but they tell little of its causal role or patterns of effects.

Ordinarily, "extensiveness" studies are reported by researchers with a restricted window on the event, employing police reports or emergency room data or coroners' analyses of accident fatalities. This means that such studies can provide data for only restricted sorts of assertions. They would need control cases, for example, in order to speak to the question of alcohol's responsibility for elevating the risk of accident. But even with only the data from police reports or coroners' analyses one can take up a number of interesting questions, and one can try to sharpen the picture that emerges from these data by looking at it selectively. In particular, researchers in this area have provided a wealth of data on alcohol's differing levels of prevalence in different sorts of accidents. This data is reviewed in II-A-1. Such descriptive data tell us not only the extensiveness of alcohol's presence in crash events but where alcohol-related crashes are particularly frequent or particularly concentrated across a series

of types of accidents. The issue of concentration can be of considerable theoretical and policy interest. From a policy standpoint, knowing in what sorts of events and when alcohol-related events are most common may help to target alcohol-related countermeasures. From an interpretive standpoint, examining the concentrations or distribution of alcohol-related events acts as a way to check for the possible influences both of contextual variables and of third factors. For example, discovering that alcohol-related fatalities were largely confined to a particular age-sex-SES sector of the population might suggest that much of both the drinking and the accident experience found on American roadways derives from larger matters of lifestyle and cultural situation. The temporal context and the demographics of traffic accidents are briefly described in II-A-2 and 3. Subsection II-A-4 reviews some of the methodological constraints surrounding "alcohol in the event, uncontrolled" studies.

Section II-B concerns controlled studies. Here, the question shifts to one of alcohol's contribution to the increased risk of crash (II-B-2). Once more, it is appropriate to examine the place of temporal context (II-B-3), demographic variables (II-B-4), and even the joint effects of time and demographics (II-B-5) on crash risk and alcohol.

Sections III, IV, and V review the person-centered research traditions. Section III focusses on the distribution of drinking patterns and practices among drivers involved in accidents. It discusses as well the prevalences of alcohol-related traffic crashes among persons with differing sorts of drinking patterns. Section IV focusses specifically on the prevalence of alcoholics or problem drinkers among persons involved in traffic crashes. Finally, Section V concerns the crash experiences of persons identified as alcoholic. Thus, Section V concerns the frequency of crashes among alcoholics while the previous section, IV, concerns the frequency of alcoholics among persons involved in crashes.

It should be noted incidentally that the report often treats separately discussions of fatal and nonfatal traffic crashes -- there are, in a sense, two worlds of traffic crash literature: the literature on traffic fatalities and that on traffic crashes in general, or, more commonly, nonfatal crashes. Also, the reader should be alert to changes of focus between discussions of alcohol-related crashes and all crashes. Sometimes, for example, we will examine all crash events irrespective of alcohol's involvement in them, other times only alcohol-related crashes will be examined. Usually it will not be difficult to decipher which is being discussed.

II. BLOOD ALCOHOL LEVEL IN THE EVENT

A. Patterning and Prevalence of Alcohol in Traffic Crashes: Uncontrolled Studies *

Of all the possible focuses for alcohol-traffic research by far the most widely studied is the extent to which one or another person involved in a crash had been drinking prior to the event. Studies numbering in the hundreds have sought simply to establish the proportion of traffic accidents in which positive BACs or BACs exceeding a certain level were found. As mentioned earlier, these sorts of reports speak to an "extensiveness" question: that is, they tell us how often alcohol was present in the event. This, of course, is not knowledge of alcohol's causal contribution, but, by establishing the frequency of alcohol's presence, such studies mark the outer boundary of blood alcohol level's potential contribution to crashes.

The original theoretical groundwork for this sort of research was laid by experimental studies focusing on the short term effects of alcohol on drinking behavior. Such experimental studies, the earliest work in the alcohol traffic field, suggested that drinking resulted in a degeneration of driving skills, including reaction time, coordination, visual awareness and attention, as well as impairment of judgment, decision-making and risk-evaluation involved in driving behavior in laboratory settings or on closed circuit driving courses (Moskowitz, 1974; Barry, 1974; Perrine, 1974). On the basis of the theoretical premises formulated in the experimental studies, and backed by popular thought on alcohol's role in crashes, subsequent epidemiological research sought to establish alcohol as a factor in actual on-the-road traffic crashes.

However, little effort was made in these latter studies to connect empirical findings to particular alcohol theories. Thus, even today the

*

This section does include some purely descriptive data from the accident samples in a few of the controlled studies, although the majority of information is derived from uncontrolled studies.

link between experimental studies concerning specific effects of alcohol on driving behavior and epidemiological studies on the incidence of alcohol in actual traffic crashes remains weak. To what extent, if any, alcohol results in traffic crashes through its effect on motor coordination or as a disinhibitor which increases willingness to take risks is still unknown.

1. Types of Accidents

Until the early 1960's it was widely believed that as few as 1% of all traffic crashes involved someone who had been drinking. Though current estimates are higher, in fact the sort of alcohol-involvement statistic one finds in the literature greatly depends on how broadly the term "accident" or "crash" is defined. Most crashes, of course, are relatively minor affairs, involving no injury and small property damage. If we ask the question of alcohol's presence in "all crashes," a set of events which is heavily weighted with minor incidents, alcohol is only relatively infrequently present. It has been suggested that roughly 10% of all accidents involve someone with a positive BAC, and about 6% of accident-involved drivers have BACs of .10% or higher (Borkenstein et al., 1964).

Of course, by their natures, minor crash events are less likely than serious ones to occasion a blood alcohol test. Thus, accident report data may contain strong alcohol reporting biases. For example, police may be reluctant to mention alcohol without supporting test evidence and tests may be imposed only in cases that seem to show a good chance of coming out positive.

Be that as it may, as we begin to tighten the definition of crashes, restricting our attention to relatively more serious events, positive BACs become more and more common. For example, three studies (Farris et al., 1975; Borkenstein et al., 1964; Pelz et al., 1975) have presented data showing that accidents involving relatively greater levels of injury also involve relatively higher likelihoods of drivers with positive or elevated BACs. Farris et al. (1975)

reported that among Huntsville, Alabama drivers who had suffered a serious or critical injury in their accidents, 21% had BACs of .10% or higher. Among drivers who suffered no injury, 11% had BACs that high. Similarly, Borkenstein et al. (1964), showed that in high property-damage accidents (\$1000+) 16% of drivers had BACs over .05%; in low damage events, 10% did.

The most dramatic increase in the extent of alcohol's presence in crash events, however, appears when we restrict our attention to traffic fatalities. As seen in Figure T-1^{*}, reports from a number of U.S. studies of traffic fatalities suggest that between 35% and 59% of drivers killed in crashes have BACs .10% or higher.² Among U.S. studies of nonfatally injured drivers, on the other hand, estimates range from 6-25%. (See tables T-1 through T-7 which follow for more detailed information on individual studies compiled in Figure T-1. These tables also include a small number of foreign studies.)

Perhaps because of the more readily available information on alcohol's presence in fatal crashes (i.e., from coroner's reports), or because of the greater extent to which high blood alcohol levels are found in fatally injured persons, both researchers and policy spokesmen have placed a greater emphasis on alcohol's role in traffic fatalities than on its role in non-fatal injuries. This emphasis on fatal crashes can be misleading unless one remembers that only a small fraction of all crashes result in death. [Borkenstein et al. (1964) found that only 5% of all traffic accidents in Grand Rapids, Michigan in a one-year period resulted in a fatality or visible signs of serious injury.]

Also worth noting is the rather substantial degree of variation in alcohol-involvement findings in most types of traffic accidents. This variation should serve as a caution against "one-number" estimates of alcohol's role in traffic crashes.

* See also Chart I in Chapter One of this report.



Table T- 1
 Empirical Studies -- Traffic
 Driver Fatalities Overall
 % Alcohol in the Event

Author, Date, Location	Total N*	N Tested for BAC	% N Tested with BAC \geq .10
<u>United States</u>			
Freimuth et al., 1958, Baltimore, Md.	156 ^b	156	58 ^d
McCarroll and Haddon, 1962, New York City	46 ^a /37 ^b	34	50
Nielson, 1963, 8 Counties, California	648 ^b	633	45
New Jersey Dept. of Law and Public Safety, 1964, New Jersey	--	820	41
Waller and Turkel, 1966, San Francisco, Calif.	61 ^a	43	53
Kowalski, et al., 1967, Illinois	--	936	35
Boston Univ. Law-Medicine Institute, 1969, Greater Boston Area	25 ^a	22	59
Neilson, 1969, 47 Counties, California	5406 ^b	5123	44
Waller, et al., 1969, 3 Counties, California	--	506	48
Baker and Spitz, 1970, Baltimore, Md.	328 ^a	224	48
Filkins, et al., 1970, Wayne County, Mich.	--	309	55
Laessig and Waterworth, 1970, Wisconsin	--	507	55 ^c
Schmidt, et al., 1970, Baltimore County, Md.	--	29	52
Baker, et al., 1971, Baltimore, Md.	227 ^a	72	53
Gerber, 1971, Cuyahoga Co., Ohio	--	77	45
Perrins, et al., 1971, Vermont	113 ^b	105	42
Gerber, 1972, Cuyahoga County, Ohio	--	94	44
Filkins and Carlson, 1973, Michigan	551 ^a	195	52
Davis, 1974, Dade County, Florida	920 ^a	668	38
McBay, et al., 1974, North Carolina	969 ^a	615	43
Rosenberg, et al., 1974, Wisconsin	--	753	56
Turk, et al., 1974, North Carolina	--	67	39
McGuire, 1975, 3 Counties, California	--	1661	38
<u>Foreign:</u>			
Wilson and Campbell, 1970, Ontario, Alberta, New Brunswick, Canada	652 ^a	560	41
Hossack, 1972, Melbourne, Australia	171 ^a	171	50
Tonge, 1972, Brisbane, Australia	447 ^b	447	45
Sevitt, 1973, Birmingham, England	29 ^a	22	36 ^c
Hossack and Brown, 1974, Victoria, Australia	273 ^a	251	37
Traffic Injury Research Foundation of Canada, 1975, 5 Provinces, Canada	1725 ^a	1348	49 ^c

- a. Total N is in these cases a total of all accidents which occurred in a given period of time in a given area.
- b. In these cases total N is a total of all "eligible" fatalities (i.e., those who survived less than the pre-determined period of time after the accident and who were in the appropriate age range).
- c. BAC \geq .08.
- d. BAC \geq .05

Table T-2

Empirical Studies -- Traffic
Passenger Fatalities
% Alcohol in the Event

Author, Date, Location	Total N	N Tested for BAC	% N Tested with BAC \geq .10
<u>United States</u>			
Freimuth, et al., 1958, Baltimore, Md.	137 ^b	137	27
New Jersey, 1964, Dept. of Law and Public Safety, 1964, N.J.	--	414	25
Waller, et al., 1969, 3 Counties, California	--	246	29
Filkins, et al., 1970, Wayne County, Mich.	--	140	27
Perrine, et al., 1971, Vermont	62 ^b	53	17
<u>Foreign</u>			
Birrel, 1971, Victoria, Australia	38 ^b	38	53 ^c
Hossack, 1972, Melbourne, Australia	119 ^b	102	36
Tonge, 1972, Brisbane, Australia	331 ^b	331	25
Sevitt, 1973, Birmingham, England	28 ^a	20	50 ^c
Hossack and Brown, 1974, Victoria, Australia	173 ^a	137	19

- a. Total N is in these cases a total of all accidents which occurred in a given period of time in a given area.
- b. In these cases total N is a total of all "eligible" fatalities (i.e., those who survived less than the pre-determined period of time after the accident and who were in the appropriate age range).
- c. BAC \geq .08.

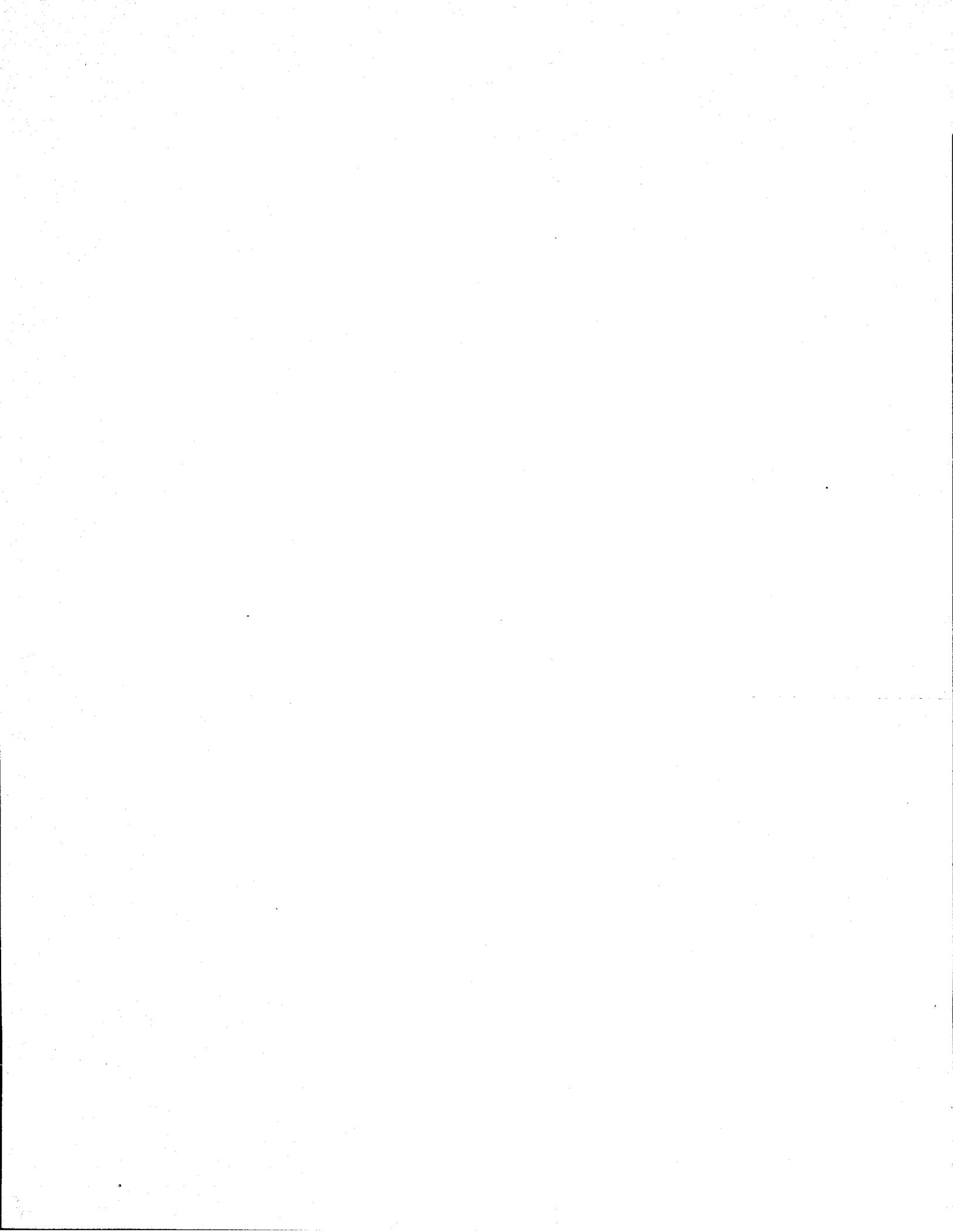


Table T-3
 Empirical Studies--Traffic
 Pedestrian Fatalities
 % Alcohol in the Event

Author, date, location	Total N	N tested for BAC	% N tested with BAC \geq .10
<u>United States</u>			
Freimuth et al., 1958, Baltimore, MD.	207 ^b	207	44 ^c
Haddon et al., 1961, Manhattan	52 ^a	19	42
Neilson, 1963, 8 counties, California	323 ^b	310	32
New Jersey Dept. of Law and Public Safety, 1964, N.J.	---	409	32
National Safety Council, 1965, California	7 ^b	6	83
Waller and Turkel, San Francisco, California	143 ^a	68 (87) ^d	26 (21) ^d
Kowalski et al., 1967, Illinois	---	206	32
Neilson, 1969, 47 counties, California	1694 ^b	1617	37
Waller et al., 1969, 3 counties, California	---	435	31
Filkins et al., 1970, Wayne County, Michigan	---	167	43
Gerber, 1971, Cuyahoga County, Ohio	---	32	25
Perrine et al., 1971, Vermont	15 ^b	14	28
Gerber, 1972, Cuyahoga County, Ohio	---	49	33
Marsden, 1972, San Diego County, California	248 ^a	144	27
Filkins and Carlson, 1973, Michigan	164 ^a	51	26
Davis, 1974, Dade County, Florida	679 ^a	408	37
McBay, et al., 1974, North Carolina	433 ^a /299 ^b	176	62
Turk, et al., 1974, North Carolina	---	33	55
McGuire, 1975, 3 counties, California	---	409	33
<u>Foreign</u>			
Solheim, 1964, Oslo, Norway	168 ^a	138	20 ^c
Wilson and Campbell, 1970 Ontario, Alberta, New Brunswick, Canada	42 ^a	28	57
Birrel, 1971, Victoria, Australia	38 ^b	38	47
Hossack, 1972, Melbourne, Australia	89 ^b	70	44
Tonge, 1972, Brisbane, Australia	617 ^b	617	30
Hossack and Brown, 1974, Victoria, Australia	55 ^a	36	11

- a. Total N in these cases is a total of all accidents which occurred in a given period of time in a given area.
- b. In these cases total N is a total of all "eligible" fatalities (i.e., those who survived less than the pre-determined period of time after the accident and who were in the appropriate age range).
- c. BAC \geq .05.
- d. Proportion in parentheses includes pedestrians less than 15 years of age. First figure excludes them.

Table T-4
 Empirical Studies--Traffic
 Single Vehicle Driver Fatalities
 % of Alcohol in the Event

Author, date, location	Total N	N tested for BAC	% N tested with BAC \geq .10
<u>United States</u>			
Haddon and Bradess, 1959, Westchester Co., N.Y.	117 ^a	83	57
Neilson, 1963, 8 counties, California	277 ^b	266	59
Davis and Fisk, 1966, Dade County, Florida	---	221	58
Gerber et al., 1966, Cuyahoga County, Ohio	225 ^a	178 (124) ^d	41 (57) ^d
California Highway Patrol, 1967, California	1285 ^b	860 (772) ^d	62 (67) ^d
Neilson, 1969, 47 counties, California	2659 ^b	2521	56
Waller et al., 1969, 3 counties, California	---	237	60
Filkins et al., 1970, Wayne County, Michigan	---	108	65
Schmidt et al., 1970, Baltimore, Maryland	---	18	67
Gerber, 1971, Cuyahoga County, Ohio	---	33	54
Perrine et al., 1971, Vermont	---	63	54
Gerber, 1972, Cuyahoga County, Ohio	---	47	51
McBay et al., 1974, North Carolina	460 ^a	308	63
Rosenberg et al., 1974, Wisconsin	---	407	72
Turk et al., 1974, North Carolina	---	39	54
McGuire, 1975, 3 counties, California	---	761	51
<u>Foreign</u>			
Wilson and Campbell, 1970 Ontario, New Brunswick, Alberta, Canada	---	207	57
Birrel, 1971, Victoria, Australia	38 ^b	38	74
Tonge, 1972, Brisbane, Australia	152 ^b	152	64
Sevitt, 1973, Birmingham, England	---	8	50 ^c
Traffic Injury Research Foundation of Canada 1975, 5 provinces, Canada	734 ^a	591	65 ^c

- a. Total N is in these cases a total of all accidents which occurred in a given period of time in a given area.
 b. In these cases total N is a total of all "eligible" fatalities (i.e., those who survived less than the pre-determined period of time after the accident and who were in the appropriate age range).
 c. BAC \geq .08.
 d. Figures in parentheses exclude crashes resulting from natural deaths behind the wheel.

Table T-5
 Empirical Studies--Traffic
 Multi-Vehicle Driver Fatalities
 % Alcohol in the Event

Author, date, location	Total N	N tested for BAC	% N tested with BAC \geq .10
<u>United States</u>			
Davis and Fisk, 1966, Dade County, Florida	---	229	24
Neilson, 1969, 47 counties, California	2747 ^b	2602	32
Waller et al., 1969, 3 counties, California	---	269	38
Filkins et al., 1970, Wayne County, Michigan	---	196	51
Schmidt et al., 1970, Baltimore, Maryland	---	11	27
Gerber, 1971, Cuyahoga County, Ohio	---	41	39
Ferrine et al., 1971, Vermont	---	43	23
Gerber, 1972, Cuyahoga County, Ohio	---	43	35
McBay et al., 1974, North Carolina	509 ^a	307	24
Rosenberg et al., 1974, Wisconsin	---	346	37
Turk et al., 1974, North Carolina	---	28	18
McGuire, 1975, 3 counties, California	---	878	27
<u>Foreign</u>			
Wilson and Campbell, 1970, 5 provinces, Canada	---	353	31
Sevitt, 1973, Birmingham, England	---	14	29 ^c
Traffic Injury Research Foundation of Canada, 1975, 5 provinces, Canada	991 ^a	750	35 ^c

- a. Total N is in these cases a total of all accidents which occurred in a given period of time in a given area.
 b. In these cases total N is a total of all "eligible" fatalities (i.e., those who survived less than the pre-determined period of time after the accident and who were in the appropriate age range).
 c. BAC \geq .08.

Table T-6
 Empirical Studies--Traffic
 Driver Fatalities by Responsibility
 % Alcohol in the Event

Author, date, location	Total N	N tested for BAC	% N tested with BAC > .10
<u>Responsible Drivers (Single and Multiple Vehicle):</u>			
<u>United States</u>			
McCarroll and Haddon, 1962, New York City	30 ^b	24	58
National Safety Council, 1965, California	32 ^a	28	75
Boston University Law-Medicine Institute, 1969, Greater Boston Area	---	19	63
Selzer, 1969 ^a , Washtenaw County, Mich.	96 ^b	40	73 ^c
Baker et al., 1971, Baltimore, Maryland	---	56	66 ^d
Perrine, et al., 1971, Vermont	---	92	45
<u>Responsible Drivers (Multiple Vehicle Only):</u>			
<u>United States</u>			
Neilson, 1967, 41 counties, California	---	847	44
Perrine, et al., 1971, Vermont	---	29	31
<u>Canada</u>			
Wilson and Campbell, 1970, 3 provinces, Canada	---	205	37
<u>Not Responsible Drivers:</u>			
<u>United States</u>			
McCarroll and Haddon, 1962, New York City	13 ^b	10	30 ^d
Baker, et al., 1971, Baltimore, Md.	---	11	9 ^e
Nielson, 1967, 41 counties, California	---	361	12
Perrine, et al., 1971, Vermont	---	14	7

- a. Total N is in these cases a total of all accidents which occurred in a given period of time in a given area.
- b. In these cases total N is a total of all "eligible" fatalities (i.e., those who survived less than the pre-determined period of time after the accident and who were in the appropriate age range).
- c. Includes dead and surviving drivers responsible for fatal crashes.
- d. Includes all drivers whose responsibility for the crash was not determined as well as all drivers who were definitely judged not responsible for the crash. This category not included in Figure T-1.
- e. Alcohol present, not necessarily greater than .10.

Table T - 7

Empirical Studies -- Traffic
Non-Fatal Accidents (Driver)
% Alcohol in the Event

Author, Date, Location	Total N	N Tested for BAC	% N Tested with BAC \geq .10
<u>Serious Injury Accidents (All Drivers): United States</u>			
Holcomb, 1938, Evanston, Ill.	---	270	25
Farris, et al., 1975, Huntsville, Ala.	109 ^a	101	21
<u>All Injury Producing Accidents (All Drivers): United States</u>			
Farris, et al., 1975, Huntsville, Ala.	615 ^a	599	13
<u>All Injury Producing Accidents (Responsible Drivers): United States</u>			
Farris, et al., 1975, Huntsville, Ala.	---	318	22
<u>All Injury Producing Accidents (Non-Responsible Drivers): United States</u>			
Farris, et al., 1975, Huntsville, Ala.	---	281	3
<u>All Accidents (Drivers): United States</u>			
Borkenstein, et al., 1964, Grand Rapids, Mich.	9353 ^a /6589 ^b	5985	6

a. Total N is in these cases a total of all accidents which occurred in a given period of time in a given area.

Traffic crashes, of course, involve not only drivers but passengers and pedestrians as well. Figure T-1 reveals that in U.S. studies reporting BACs of .10% or higher among pedestrian fatalities, the range in findings is great, from a low of 25% to a high of 83%. Between 17% and 29% of passenger fatalities have BACs of .10% or higher.

Though, presumably, the intoxication of a passenger is not often directly involved in the cause of a crash, that fatally injured passengers often have lower BACs than fatally injured drivers has suggested the possible utility of a social policy aimed at "letting the passenger drive." For example, drunk driving penalties might be increased somewhat if a passenger had a lower BAC than the driver; passengers riding with intoxicated drivers might be subject to an offense, which would in turn supply a legal means for getting drinking-related information about passengers as well as drivers.

Just as the level of intoxication of a fatally injured passenger may not contribute as directly to the cause of a crash as the blood alcohol level of a fatally injured driver might, the BAC of a driver who is considered not to be at fault in a crash might have less direct implications for alcohol's role in traffic crashes than would the BAC of a driver responsible for initiating a crash. This is, of course, not to say that alcohol could not affect defensive driving skills as well. To more closely examine this question, researchers have often compared the extent to which alcohol is present in groups of drivers with varying levels of responsibility for traffic accidents.

One of the most common methods used to determine the general level of responsibility for a traffic crash is to ask whether or not more than one driver was involved. Drivers in single-vehicle crashes are, by virtue of being the only driver involved, always judged by researchers to be responsible for initiating the crash (although not necessarily legally responsible).

Multi-vehicle crashes are, however, thought to involve a non-responsible driver and a responsible driver. This fact is often used to explain the greater proportion of drinking drivers in single-vehicle as compared to multi-vehicle crashes. As seen in Figure T-1, drivers with BACs of .10% or higher account for 41-72% of fatally injured drivers in single-vehicle accidents and 18-51% of those in multi-vehicle crashes.

Beyond the simple distinction between single and multi-vehicle crashes, further determinations of responsibility are sometimes made. While all drivers in single-vehicle crashes are considered responsible for initiating the crash, drivers in multi-vehicle crashes can be classed as non-responsible drivers, drivers in accidents in which responsibility could not be determined, or responsible drivers. U.S. studies reporting blood alcohol level for these various groups of drivers have shown a pattern of increasing alcohol-involvement as the level of responsibility for the crash increases; with respect to fatal crashes, drivers with BACs of .10% or higher account for 7-12% of non-responsible drivers (Figure T-1), 30% of a combined group of non-responsible drivers and drivers with undetermined responsibility (McCarroll and Haddon, 1962), 31-44% of responsible drivers in multi-vehicle crashes (Figure T-1), and 45-75% of responsible drivers in single and multi-vehicle crashes combined (Figure T-1).

Of course, the possibilities that obviously intoxicated drivers may have a greater likelihood than sober drivers of being labelled "responsible" or that responsible drivers may be tested for blood alcohol content more frequently than are non-responsible drivers must be recognized. Even with these possibilities in mind, however, the difference in blood alcohol level between responsible and non-responsible drivers seems quite apparent.

Summary

The role alcohol plays in traffic accidents cannot easily be summarized

into a single statement or a single figure. The level of alcohol-involvement in traffic crashes depends greatly on the type of accident in question. Alcohol plays a far greater role in traffic crashes which result in fatality than in accidents which produce lesser injuries. Moreover, alcohol is involved to a larger degree in serious injury, non-fatal accidents than in other non-fatal crashes which result in minor or negligible injuries.

In addition, alcohol plays a greater role in single-vehicle than in multi-vehicle crashes, for both fatal and non-fatal accidents. With respect to fatal crashes, alcohol is involved in a larger proportion of driver fatalities than of passenger fatalities and is more characteristic of drivers judged responsible for fatal crashes than of non-responsible drivers.

These variations in the prevalence of alcohol in different types of traffic accidents should, however, be viewed with a critical eye. For example, the difference in the extent to which alcohol is involved in fatal and non-fatal accidents may merely reflect differences in the level of drinking or intoxication in the general driving population at the times fatal and non-fatal accidents typically occur. Or, other characteristics, such as age, sex, or experience with drinking, associated with drivers involved in these various types of accidents may be reflected in either or both the level of alcohol-involvement and the extent of injury in traffic crashes. All of these factors can significantly affect the interpretation of the role alcohol plays in traffic accidents. Therefore, the following discussion will consider several of these factors.

2. Time of Day and Day of Week

U.S. drinking habits and driving patterns are subject to much variation depending on the time of day and day of week in question. Drinking occurs far more frequently during evening and nighttime hours and more often on weekends than during the rest of the week. Circumstances surrounding driving also

change throughout the week. While weekday driving may reflect a large number of persons commuting to and from work, weekend and nighttime driving may entail a good deal of pleasure and recreational driving. Weekday driving may involve mostly moderate or heavy city and suburban traffic, while weekend trips frequently make use of highways or rural roads. Thus, different sorts of drivers with different likelihoods of being intoxicated may be on the road at different times of the day or on different days of the week. It would not be surprising, then, to find that different types of accidents typically occur at various periods throughout the week or that alcohol plays a varied role in crashes depending on the time of day and day of week they take place.

Unfortunately, there is very little data available on the patterning of traffic crashes by time of day and day of week. What follows is a discussion of only a handful of studies, all of which differ substantially both in the type of accident studied and in the methodological constraints surrounding that particular research. Comparative findings presented below must, as a result, be considered only tentative and illustrative.

Turning first to the distribution of all crashes irrespective of alcohol's presence, research from a number of studies has suggested that fatal and non-fatal accidents are distributed quite differently over time of day, but reveal more similar patterning by day of week. Data in table T-8, as well as additional data (McCarroll and Haddon, 1962; Epstein, 1971), indicate that while the majority of fatal crashes occur at night, the majority of non-fatal accidents occur during daytime hours. Table T-9 suggests that for both fatal and non-fatal crashes, accidents are distributed much more evenly throughout the week than over time of day. In addition, although differences are not large, it can be seen that more accidents, both fatal and non-fatal, occur on Friday and Saturday than on other days of the week.

TABLE T-8

DISTRIBUTION OF DRIVERS IN ACCIDENTS RESULTING IN VARIOUS
LEVELS OF INJURY BY TIME OF DAY THE ACCIDENT OCCURRED (IN PERCENT)

<u>Time of Day</u>	<u>ACCIDENT SEVERITY</u>		
	<u>Non-Fatal</u>		<u>Fatal</u>
	<u>Borkenstein et al., 1964^a</u>	<u>Farris et al., 1975^b</u>	<u>Filkins et al., 1970^c</u>
Daytime (12 hours)			
6-9 am	9.4	4.1	} 31.2
9-Noon	13.1	5.5	
Noon-3 pm	16.4	15.1	
3-6 pm	27.5	38.5	
	} 66.4	} 63.2	
Nighttime (12 hours)			
6-9 pm	15.1	18.0	} 29.9
9-Midnight	10.8	12.4	
Midnight-3 am	6.3	5.2	} 39.0
3-6 am	1.3	1.1	
	} 25.9	} 30.4	
	} 7.6	} 6.3	
Total	99.9	99.9	100.1
(N)	(9346)	(615)	(308)

a. 88% of drivers had no visible signs of injury, 7% had minor injuries, 5% had serious injuries.

b. 38% of drivers had no injuries, 45% had minor injuries, 17% had serious injuries.

c. All drivers were fatally injured

TABLE T-9

DISTRIBUTION OF DRIVERS IN ACCIDENTS RESULTING IN VARIOUS LEVELS OF INJURY BY DAY OF THE WEEK THE ACCIDENT OCCURRED (IN PERCENT)

<u>Day of the Week</u>	<u>ACCIDENT SEVERITY</u>		
	<u>Non-Fatal</u>		<u>Fatal</u>
	<u>Borkenstein et al., 1964^a</u>	<u>Farris et al., 1964^b</u>	<u>Filkins et al., 1970^c</u>
Monday	15.1	9.8	12.7
Tuesday	12.6	14.0	12.4
Wednesday	13.5	12.2	14.0
Thursday	13.5	15.4	10.7
Friday	18.8	20.2	16.3
Saturday	17.8	17.9	18.9
Sunday	8.8	10.6	15.0
Total	100.0	100.1	100.0
(N)	(9351)	(615)	(307)

- a. 88% of drivers had no visible signs of injury, 7% had minor injuries, 5% had serious injuries.
- b. 38% of drivers had no injuries, 45% had minor injuries, 17% had serious injuries.
- c. All drivers were fatally injured.

Alcohol's presence in traffic crashes can be viewed in either of two ways. The most common way to view the role alcohol plays in traffic crashes is to look at the proportion of accident-involved drivers who were drinking prior to the crash. Tables T-10 and T-11, for example, show the proportion of drivers who were drinking prior to fatal and non-fatal crashes by time of day and day of week the crash took place. Data in table T-10 suggests that for both fatal and non-fatal crashes, the proportion of drivers who were drinking increases steadily throughout the morning and afternoon, reaching a peak after midnight. Table T-11 indicates that a greater proportion of weekend (Friday, Saturday, Sunday) than of weekday crashes involve drinking drivers.

A second way of viewing the role alcohol plays in traffic crashes is by looking separately at the distributions of alcohol-related and non-alcohol-related crashes over time of day and day of week. In Figure T-2, non-fatal crashes have been separated into those which involve drinking drivers and those which involve sober drivers. The distributions of these two types of accidents over time of day reveal that accidents involving sober drivers show a high peak in the late afternoon; 3-6 p.m. contributes 44% of these events. The curve is relatively symmetrical and sharp, so that a decreasing percentage of the population of sober accidents occurs as one moves farther away from the peak period. The population of accidents involving drinking drivers, on the other hand, shows a somewhat different distribution over time of day. This curve is flatter, showing two low peaks at 3-6 p.m. and 9 p.m.-midnight. It is also shifted toward later hours: 61% of drinking-driver accidents happen after 6 p.m.; the same period accounts for only 29% of all "sober" crashes.

This pattern has appeared even more accentuated in data on fatal crashes. For example, re-calculation of data presented in Filkins et al. (1970), indicates that while 54% of accidents involving sober drivers occurred during daytime hours

TABLE T-10

PERCENT OF DRIVERS IN FATAL AND NON-FATAL ACCIDENTS WITH POSITIVE BACs
BY TIME OF DAY THE CRASH OCCURRED

<u>Time of Day</u>	<u>Accident Severity</u>	
	<u>Non-Fatal Accidents</u> ^a	<u>Fatal Accidents</u> ^b
Daytime (12 hours)		
6 to 9 am	4] 39
9 am to Noon	13	
Noon to 3 pm	19	
3 to 6 pm	14	
Nighttime (12 hours)		
6 to 9 pm	25] 69
9 pm to Midnight	51	
Midnight to 3 am	73] 86
3 to 6 am	11	

a. Farris et al., 1975: Percent BAC \geq .03.

b. Filkins et al., 1970: Percent BAC \geq .01

TABLE T-11

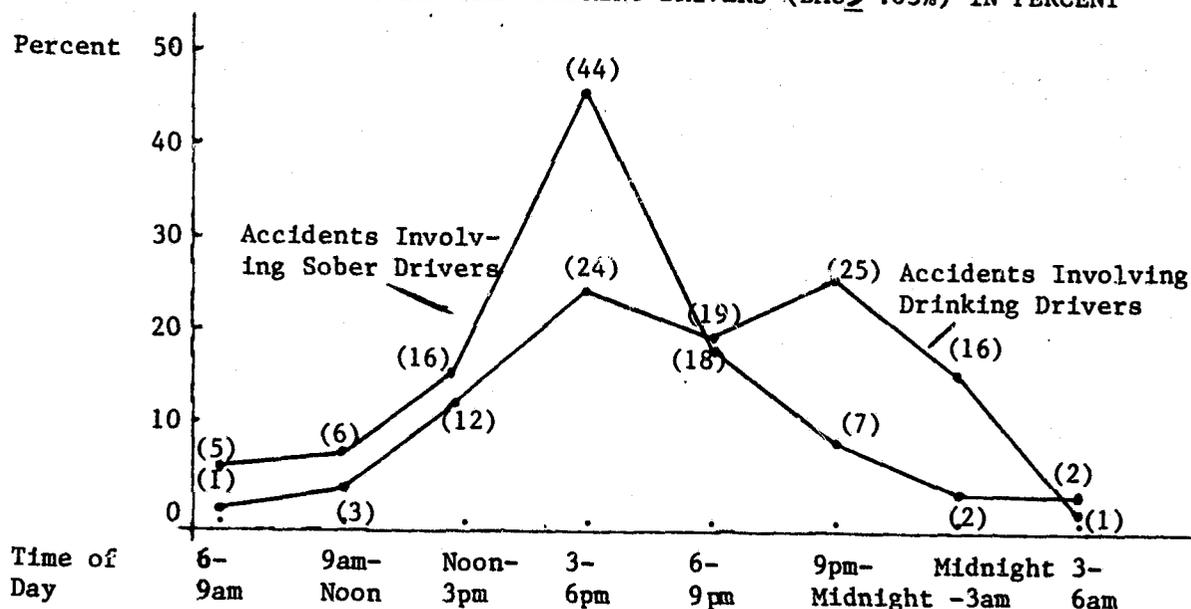
PERCENT OF DRIVERS WITH POSITIVE BACs
IN FATAL AND NON-FATAL ACCIDENTS BY
DAY OF WEEK THE CRASH OCCURRED

<u>Day of Week</u>	<u>Non-Fatal Accidents</u> ^a	<u>Fatal Accidents</u> ^b
Monday	17	51
Tuesday	19	50
Wednesday	11	65
Thursday	29	61
Friday	21	70
Saturday	27	81
Sunday	38	72

a. Farris et al., 1975: Percent BAC \geq .03%.

b. Filkins et al., 1970: Percent BAC \geq .01%.

FIGURE T-2 DISTRIBUTION OF NON-FATAL INJURY-PRODUCING ACCIDENTS OVER TIME OF DAY FOR SOBER AND DRINKING DRIVERS ($BAC \geq .03\%$) IN PERCENT



Source: Re-calculation of data presented in Farris et al., 1975.

(6 a.m. to 6 p.m.), this time period accounts for only 19% of accidents involving drinking drivers ($BAC \geq .01\%$). On the other hand, 82% of accidents involving drinking drivers ($BAC \geq .01\%$) occurred between 6 p.m. and 6 a.m., with 50% of these taking place after midnight.

Similar data on the distributions of alcohol-related and non-alcohol-related crashes by day of week suggests that in the early part of the week a larger proportion of accidents-which-involve-sober-drivers than of accidents-which-involve-drinking drivers take place. On weekends, however, the reverse is true. This pattern holds true for both fatal and non-fatal crashes (Filkins et al., 1970; Farris et al., 1975).

Both ways of looking at the relationship between alcohol and the time of day or day of week traffic crashes occur provide useful information for designing countermeasure programs aimed at reducing alcohol-related crashes. The proportion of accident-involved drivers who were drinking prior to crashes occurring at various times yields a rough measure of the concentration of drinking drivers in the accident population at a given time;

thus, it provides data on the likelihood that if a given driver were tested for blood alcohol content, whether he would show a positive or elevated BAC.

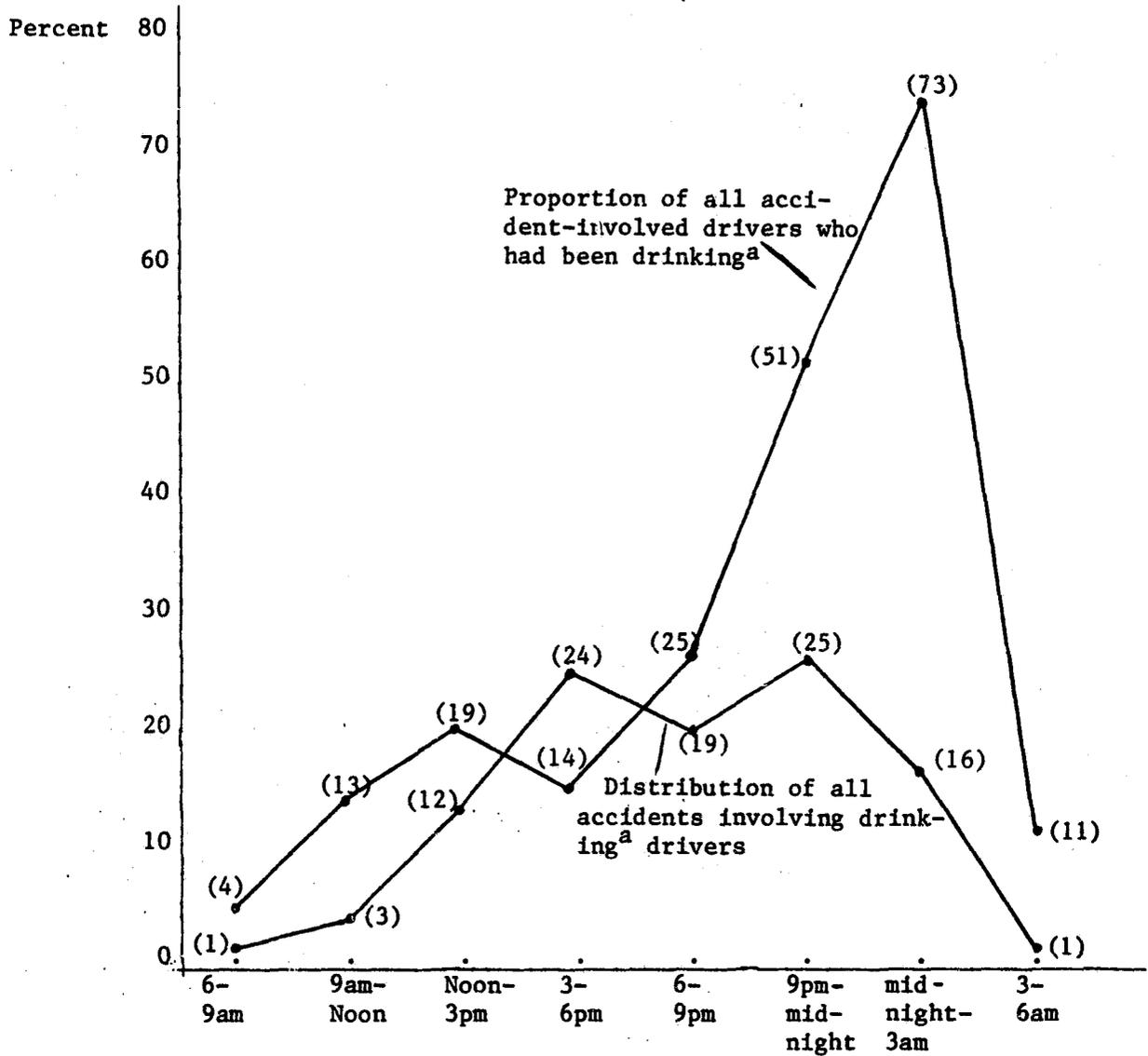
On the other hand, this type of data tells us little about how large or small a proportion of alcohol-related accidents would be prevented if a police crack-down on drunk driving was enforced on any given night. This type of information is available only when looking at the distribution of alcohol-related accidents over time of day or day of week.

If it were the case that both of these ways of viewing the role alcohol plays in traffic crashes consistently resulted in similar findings, few problems would be encountered in interpreting relevant data for prevention strategies. However, this is not always the case. For example, Figure T-3 indicates that between midnight and 3 a.m. 73% of accident-involved drivers had been drinking, but only 16% of all accidents-which-involved-drinking-drivers occurred during this time. On the other hand, only 3% of accident-involved drivers had been drinking prior to accidents which occurred between 9 a.m. and noon, but this time period accounts for 13% of all accidents-which-involved-drinking-drivers.

The key to understanding this comparison rests on the number of accidents which occur at different periods of the day. In this example, although a large proportion (73%) of drivers had been drinking between midnight and 3 a.m., only a small number (30) of accidents actually occurred. In contrast, while only a small proportion (14%) of drivers had been drinking between 3 and 6 p.m., a large number (235) of accidents occurred. Thus, midnight to 3 a.m. accounts for only 16% of all accidents-which-involved-drinking-drivers while 3 to 6 p.m. accounts for 24%.

Turning to the patterning of alcohol in traffic crashes jointly by time of day and day of week, alcohol's role can again be viewed in two ways. Looking

FIGURE T-3: COMPARISON OF THE PROPORTION OF ALL ACCIDENT-INVOLVED DRIVERS IN NON-FATAL CRASHES WHO HAD BEEN DRINKING AND THE DISTRIBUTION OF ALL NON-FATAL ACCIDENTS WHICH INVOLVED DRINKING DRIVERS OCCURRING DURING THE SAME TIMES OF THE DAY (IN PERCENT)



a. BAC \geq .03%

Source: Re-calculation of data presented in Farris et al., 1975.



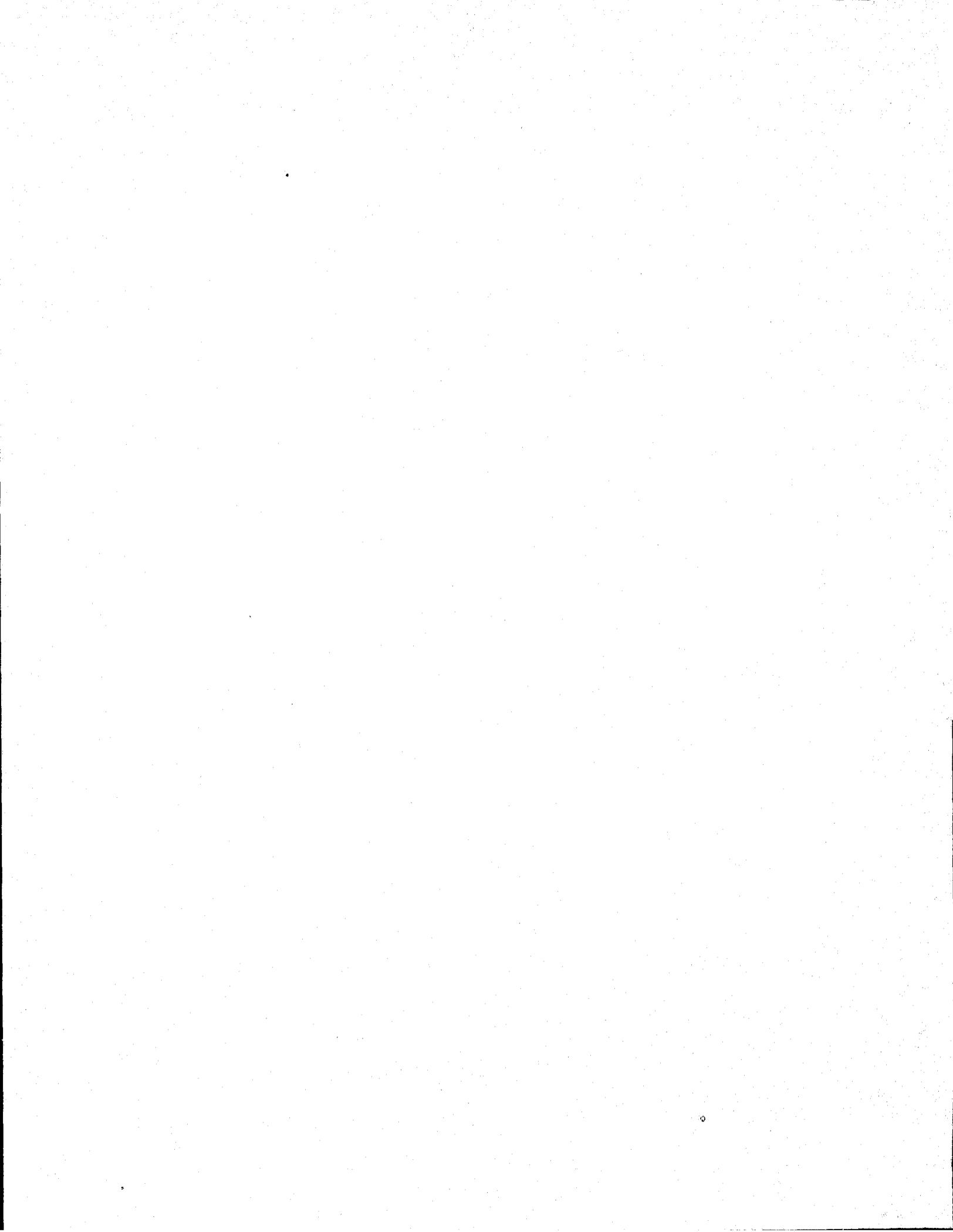
CONTINUED

2 OF 9

first at the proportion of accident involved drivers who were drinking within each three hour interval throughout the week, data on non-fatal crashes in Figure T-4 reveals that the largest proportion of drinking drivers is apparent between midnight and 3 a.m. on Monday, Tuesday and Wednesday nights.³ On several days, however, there are two periods when the proportion of accident-involved drivers who were drinking becomes elevated; one in the early afternoon and a more substantial increase again around midnight. On Friday, Saturday, and Sunday, as compared to other days of the week, the proportion of drivers who were drinking remains elevated for a longer period of time throughout the day.

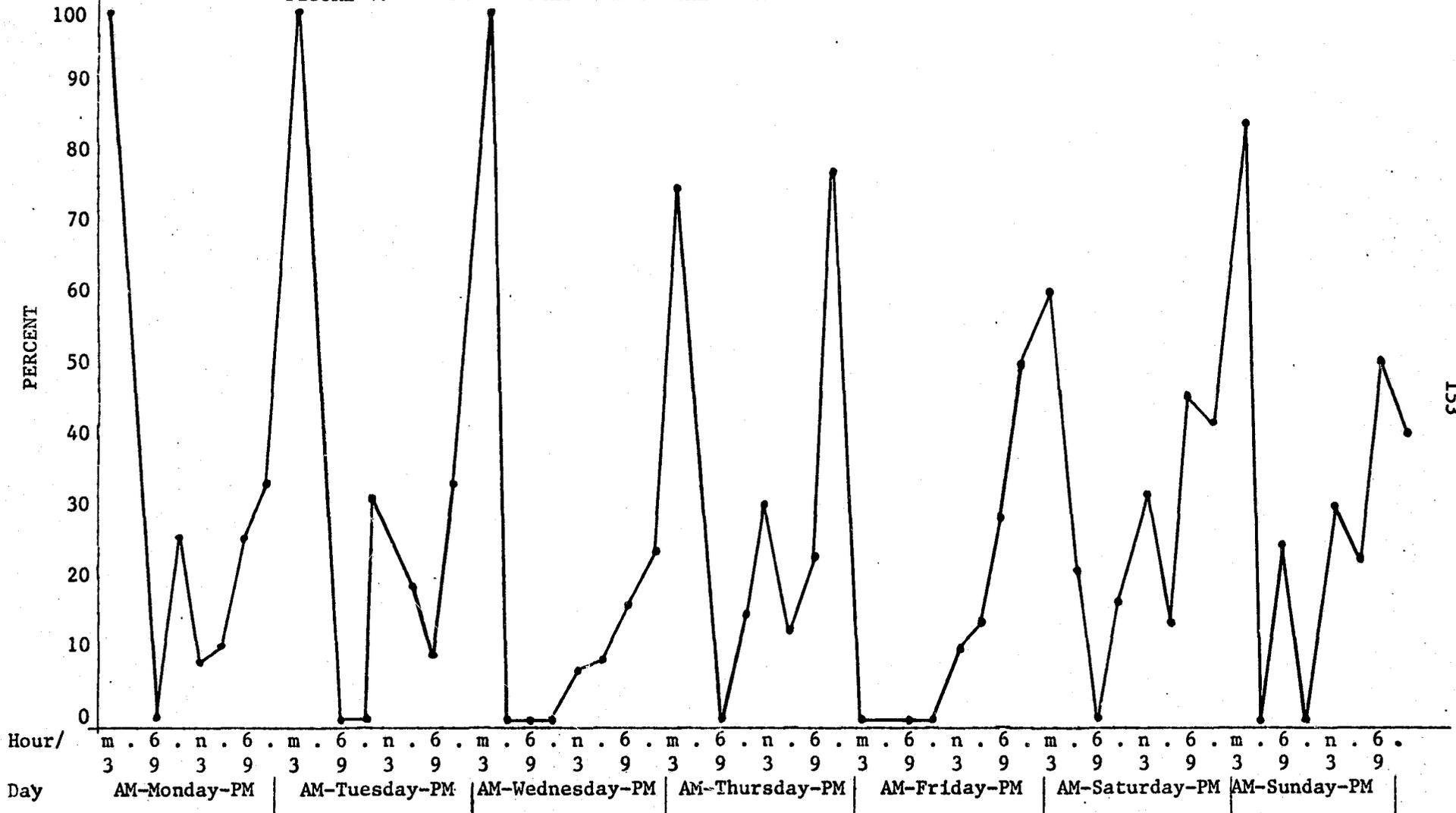
Based on data from the same study (Farris et al., 1975), Figure T-5 presents the distributions of alcohol-related and non-alcohol-related crashes by hour and day of the week. Although both alcohol-related and non-alcohol-related crashes occur more frequently on Thursday, Friday and Saturday than on other days of the week, alcohol-related crashes occur over a longer period of time on these days than do non-alcohol-related crashes. While both alcohol-related and non-alcohol-related crashes become more frequent in the afternoon, a comparatively larger proportion of accidents-involving-sober-drivers than those-involving-drinking-drivers occur during this time. Moreover, only alcohol-related crashes peak around midnight; in contrast, only a small proportion of non-alcohol-related crashes occur during this time.

This same pattern is reflected in a second study on non-fatal crashes presented in Figure T-6. Non-alcohol-related crashes have a fairly consistent pattern throughout the week with a daily peak in the late afternoon. A lesser peak is apparent on weekday mornings but is absent on weekends. Alcohol-related crashes, in contrast, peak slightly after midnight, with a larger proportion occurring on Friday and Saturday nights.



PERCENT OF DRIVERS IN NON-FATAL ACCIDENTS WHO HAD BEEN DRINKING (BAC \geq .03%)
BY HOUR AND DAY OF THE WEEK

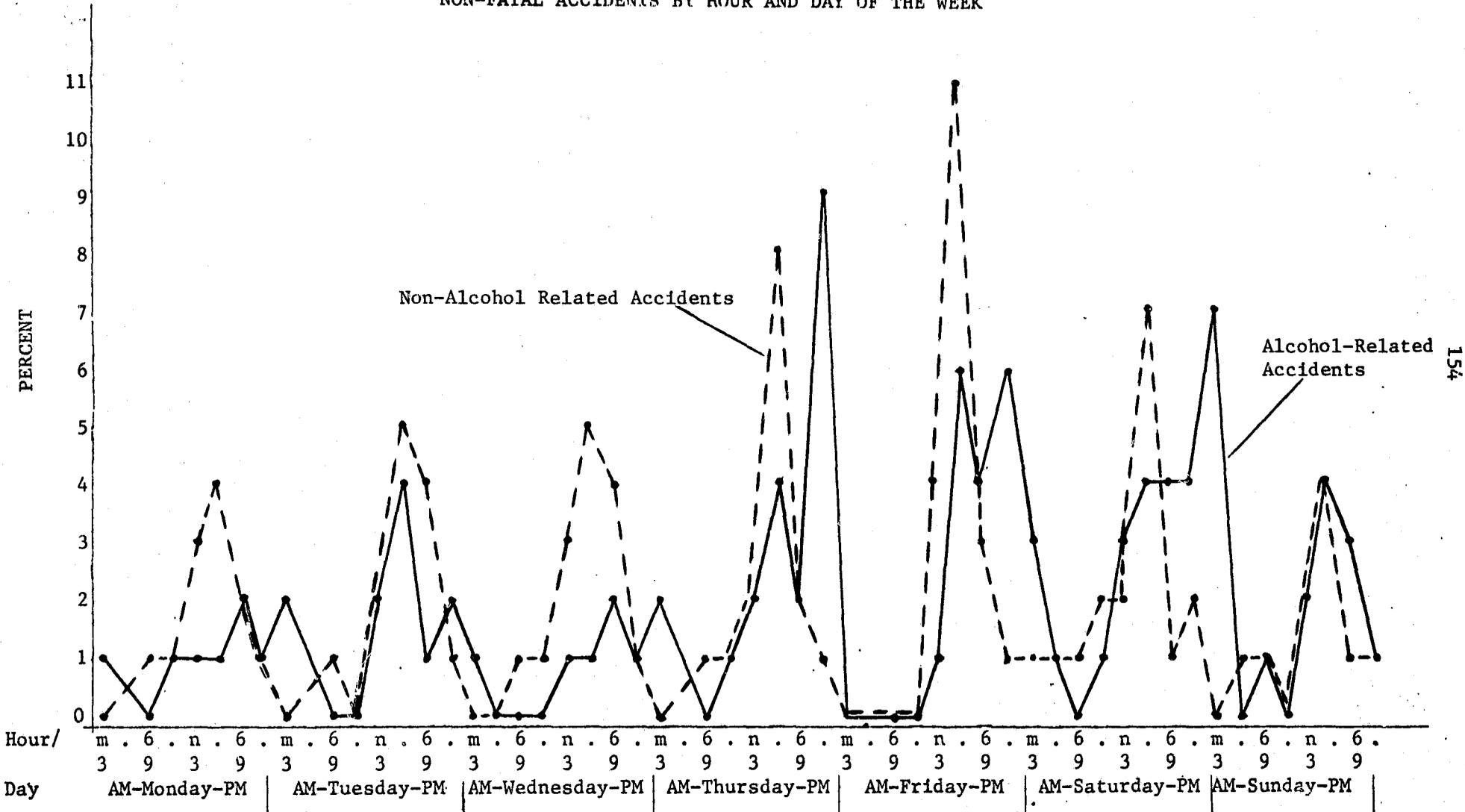
FIGURE 4:



a. M=Midnight, N=Noon. The graph begins at midnight on Monday with the first time period being Midnight to 3AM. Only every other one of the 3 hour time intervals are labelled.

Source: Re-calculation of data presented in Farris et al., 1975.

FIGURE T-5 : DISTRIBUTION OF ALCOHOL-RELATED (BAC \geq .03%) AND NON-ALCOHOL-RELATED NON-FATAL ACCIDENTS BY HOUR AND DAY OF THE WEEK



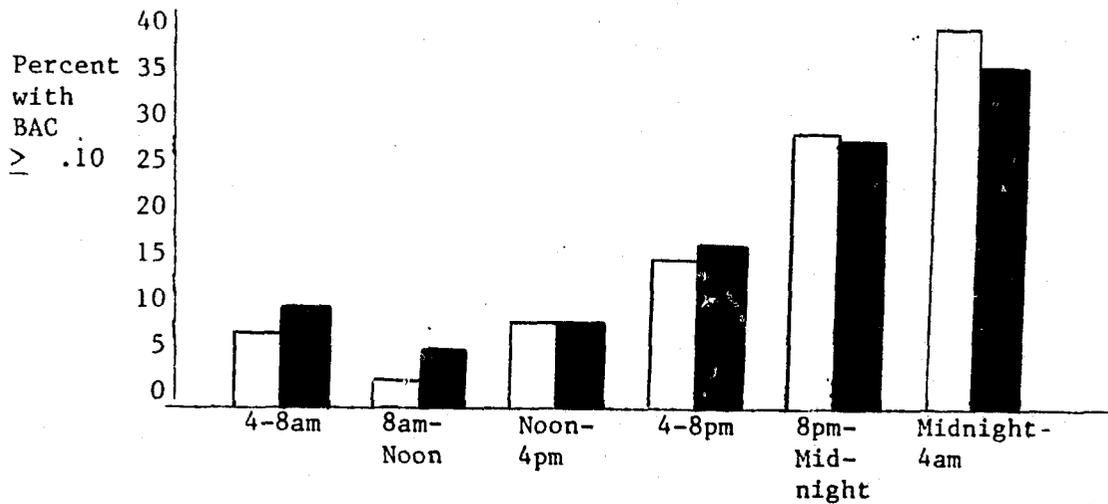
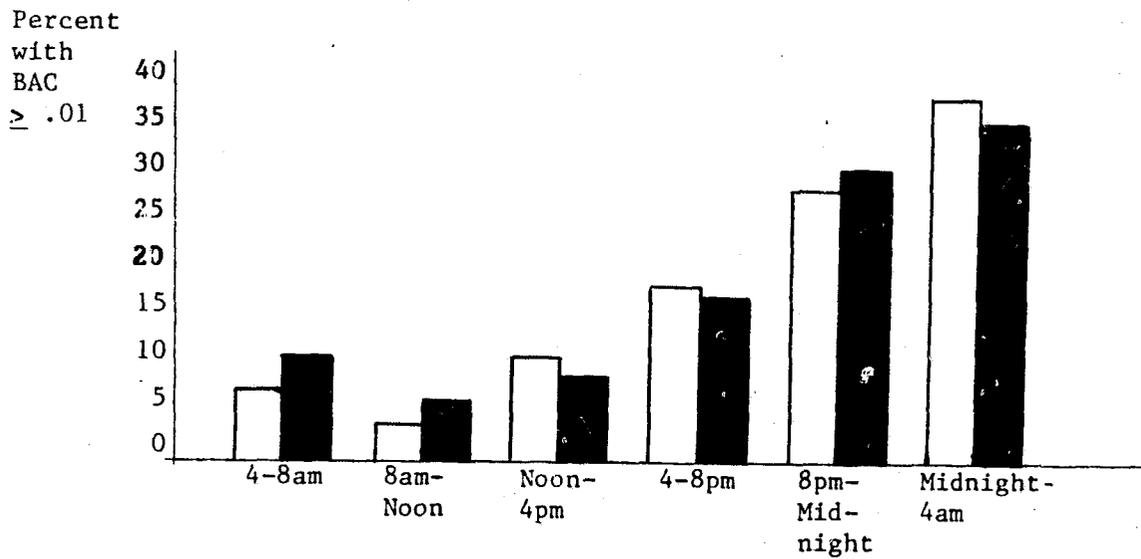
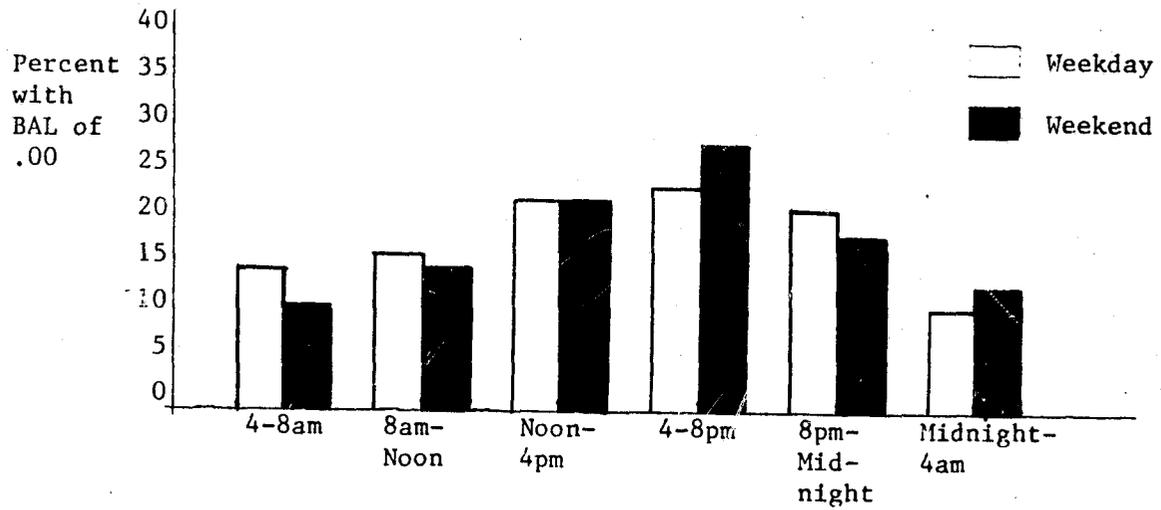
a. M=Midnight, N=Noon. The graph begins at midnight on Monday with the first time period being Midnight to 3AM. Only every other one of the 3 hour time intervals are labelled.

Source: Re-calculation of data presented in Farris et al., 1975.

With respect to fatal crashes, the one available study (McGuire, 1975) found that the patterning of alcohol-involvement in accidents by hour and day of the week was somewhat different. Data in Figure T-7 presents the distribution by hour and weekend versus weekday of accidents involving sober drivers (BAL of .00%), drinking drivers (BAL of .01% or higher), and drivers with high alcohol concentrations (BAL of .10% or higher). This data indicates that the overall pattern of alcohol-involvement in crashes is different for sober drivers than for the two groups of drinking drivers. However, these differences are limited only to the time of day the accidents occurred. Accidents involving sober drivers occurred with greater frequency during the afternoon and early evening hours (Noon to 8 p.m.), while crashes involving drinking drivers as well as the subgroup of drinking drivers with very high alcohol concentrations occurred more often between 8 p.m. and 4 a.m. Differences between the proportions of accidents occurring on the weekend (Friday, Saturday and Sunday) and on the weekdays were not significant for any of the three groups of fatally injured drivers.

Although data on the role alcohol plays in traffic crashes at different times of the day and on different days of the week is severely limited, the above discussion has yielded several tentative observations. Research to date has suggested the often dramatic variation in the extent to which alcohol is present in different sorts of crashes and at various periods throughout the week. A better understanding of these patterns should be of high priority for future research and for prevention strategies aimed at reducing drunk driving and its resultant traffic deaths and injuries.

FIGURE T-7 : DISTRIBUTION OF FATAL ACCIDENTS BY HOUR AND DAY OF THE WEEK FOR DRIVERS WITH DIFFERENT ALCOHOL CONCENTRATIONS



Source: McGuire, 1975

3. Demographic Factors

Variation in the role alcohol plays in traffic crashes according to the type of accident and the time of day and day of week the accident occurred has already been documented. Little has been said, however, concerning the characteristics which identify the kind of driver who becomes involved in traffic crashes in general, and in alcohol-related crashes in particular.

Age

Of all the traditional driver characteristics which typically make their way into research on traffic crashes, age has produced one of the strongest and most consistent associations with accident-involvement. Several studies have noted that young drivers, aged 16 to 25, are involved in a disproportionately large number of traffic crashes (Borkenstein et al., 1964; Carlson, 1973; Pelz et al., 1975). The data would suggest that traffic crashes are a significantly greater problem for young drivers than for their older counterparts.

Focusing on the role of alcohol in the accident experience of younger and older drivers reveals that the level of alcohol-involvement in traffic crashes is appreciably different for these age groups. As seen in Figure T-8, the proportion of accident-involved drivers in each age group who were drinking at the time of the crash increases as age increases. This and other data (Borkenstein et al., 1964; Waller et al.,

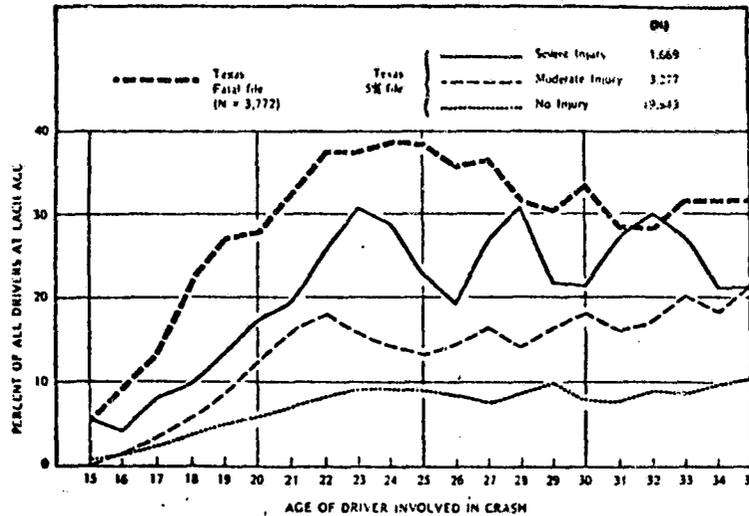


FIGURE T- 8 *Accidents of Drinking Drivers as Percentages of All Male Drivers at Each Age and Severity Level. Data from Texas 1969-70 fatal file and Texas 5% 1969-70 file; 2-year moving mean.*

SOURCE: Pelz et. al., 1975.

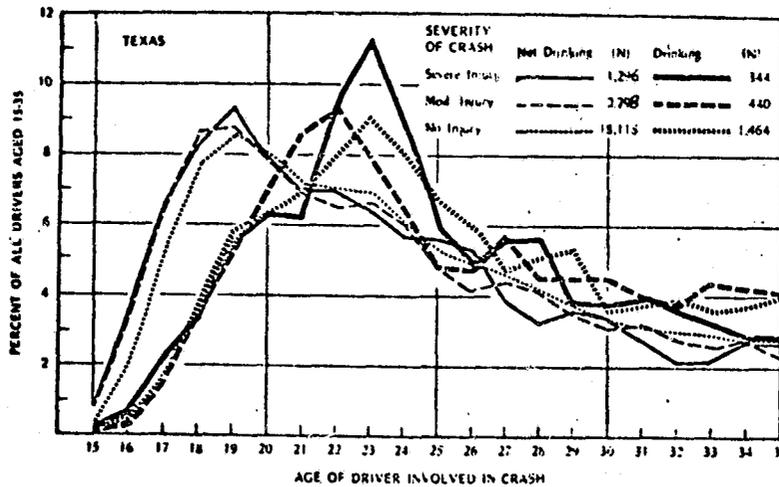


FIGURE T-9 *Percentages of Males Aged 15-35 in Texas 5% File, by Presence of Drinking and Severity of Injury; 2-Year Moving Mean*

SOURCE: Pelz et. al., 1975.

1969a; Filkins et. al., 1970; Perrine et. al., 1971) indicate that drinking drivers are a relatively small proportion of all accident-involved drivers in the lower age groups. This proportion increases and is substantially larger until the ages of 60 or 70 when the proportion of accident-involved drivers who were drinking is again low.

It can also be seen in Figure T-8 that this pattern holds for accidents resulting in different levels of injury, although the proportion of drivers in all age groups who were drinking prior to the crash increases as the severity of the crash increases.

Taking a somewhat different approach to this data reveals, however, that a larger proportion of alcohol-related crashes involved young drivers than any other equivalent age group. As seen in Figure T-9, the largest proportion of both alcohol-related and non-alcohol-related crashes involve drivers under the age of 25.

The apparent discrepancy in figures T-8 and T-9 is largely explained by the greater number of young drivers than of older drivers who are involved in accidents. Although only a small proportion of young drivers were drinking at the time of the crash, the number of young drivers involved in accidents is comparatively so large that even a small proportion of this number accounts for a quite large proportion of all drivers involved in alcohol-related crashes. The large number of young drivers who are involved in accidents is reflected in the fact that this group accounts for more non-alcohol-related crashes as well as more alcohol-related crashes than drivers in other age groups.

Although there is agreement among researchers on the general period of the life span during which the majority of crashes occur, there is a debate in the literature over the specific years during which the frequency of non-alcohol-related crashes is the highest. Whereas most researchers agree that the largest proportion of alcohol-related crashes involve drivers in the 20-24 year age group, researchers do differ as to whether the frequency of non-alcohol-related crashes is greatest in the 18-19 year age group or in the 20-24 year age group (California Highway Patrol, 1967; Carlson, 1973; Rosenberg et al., 1974; McGuire, 1975; Pelz et al., 1975).

This issue has, in recent years, given rise to an additional point of controversy in the literature. With the lowering of the age of majority many states reduced the legal drinking age from 20 or 21 to 18. As a result researchers have been interested in the possible effects of this legal change on the involvement of young drivers in alcohol-related crashes.

There is some evidence that young drivers were involved in a larger number of alcohol-related accidents after the legal drinking age was lowered than prior to this change (Douglass and Filkins, 1974; Williams et al., 1975). However, research has shown that the increase in alcohol-related crashes among young drivers has not been of equal magnitude across different states (Douglass and Filkins, 1974). Moreover, although large increases were predicted, alcohol-related crashes increased a maximum of 25% among 18-20 year olds in one state (Douglass and Filkins, 1974), 5% among 15-20 year olds in another two states and

a province in Canada (Williams et al., 1975), and did not increase at all in another state (Douglass and Filkins, 1974).

An additional change in the accident-involvement of young drivers after the lowering of the legal drinking age concerns the specific ages during which the frequency of alcohol-related and non-alcohol-related crashes is the greatest. In one state in which, prior to the lowering of the legal drinking age, non-alcohol-related crashes peaked in the 18-19 year age group and alcohol-related crashes peaked in the 22-23 year age group, a general merging and rounding out of these two curves was observed after the legal change (Douglass and Filkins, 1974).

Controversy exists over the cause of these increases in alcohol-related crashes among young drivers. While some researchers attribute these increases to the effects of the lowering of the legal drinking age (Douglass and Filkins, 1974; Williams et al., 1975), others attribute them to an increase in teenage drinking which was already beginning before the legal drinking age was lowered (Zylman, 1973). This is, then, an area for future research.

The most common explanation offered by researchers for the consistently high accident-involvement of young drivers is the inexperience of this group with driving and with drinking and driving. The large proportion of non-alcohol-related accidents that involve young drivers are attributed to inexperience in driving, while the large proportion of alcohol-related crashes in this age group are attributed to inexperience with driving after drinking. One study has shown that in the first four years of driving, 45% of males and 28% of females were involved in traffic accidents (Harrington, 1971).

Sex

Traffic crashes are predominantly the territory of men. Men outnumber women substantially by a ratio of at least 3 or 4 to 1 in both fatal and non-fatal crashes (Borkenstein et al., 1964; Filkins et al., 1970; Perrine et al., 1971; McGuire, 1975). In fact, in one study of fatal accidents, there were no women in the entire sample of accident-involved drivers (McCarroll and Haddon, 1962).

Moreover, data in Tables T-12 and T-13, as well as additional data (Farris et al., 1975; McGuire, 1975), indicates that a larger proportion of men than of women were drinking prior to both fatal and non-fatal crashes. This pattern also holds with respect to very high alcohol levels. It is interesting to note, however, that while the proportion of women who were drinking in fatal and non-fatal crashes reported in this table is rather similar (14% and 9%, respectively), the proportion of men who were drinking increases substantially from 19% in non-fatal crashes to 56% in fatal crashes.

Taking a different perspective on this data, Tables T-14 and T-15 present the proportions of males and females in several groups of drivers with various alcohol concentrations for fatal and non-fatal accidents. Both tables reveal that the ratio of males to females is much larger in all of the drinking groups than in the non-drinking group.

Marital Status

Although the proportion of married and non-married drivers involved in accidents varies across studies, a larger proportion of non-married drivers than of married drivers were drinking prior to the crash. This

TABLE T-12

DISTRIBUTION OF BLOOD ALCOHOL CONTENT
FOR MALE AND FEMALE DRIVERS FATALLY
INJURED IN TRAFFIC ACCIDENTS (IN PERCENT)

<u>Sex</u>	<u>Blood Alcohol Content</u>					<u>Total</u>	<u>(N)</u>
	<u><.02</u>	<u>.02-.04</u>	<u>.05-.09</u>	<u>.10-.14</u>	<u>≥.15</u>		
Male	44	8	8	14	26	100	(137)
Female	86	3	6	3	3	101	(35)

Source: Perrine et al., 1971

TABLE T-13

DISTRIBUTION OF BLOOD ALCOHOL CONTENT
FOR MALE AND FEMALE DRIVERS INVOLVED
IN NON-FATAL ^a ACCIDENTS (IN PERCENT)

<u>Sex</u>	<u>Blood Alcohol Content</u>					<u>Total</u>	<u>(N)</u>
	<u>.00</u>	<u>.01-.04</u>	<u>.05-.07</u>	<u>.08-.10</u>	<u>.11+</u>		
Male	81	7	3	3	6	100	(4657)
Female	91	4	1	4 ^b		100	(1326)

a. Includes 17 fatalities

b. Includes data above these limits

Source: Borkenstein et al., 1964

TABLE T-14

PROPORTION OF MALES AND FEMALES WITHIN
BLOOD ALCOHOL CATEGORIES FOR DRIVERS
FATALLY INJURED IN TRAFFIC ACCIDENTS
(IN PERCENT)

<u>Sex</u>	<u>Blood Alcohol Content</u>					<u>All</u>
	<u><.02</u>	<u>.02-.04</u>	<u>.05-.09</u>	<u>.10-.14</u>	<u>≥.15</u>	
Male	67	92	85	95	97	80
Female	33	8	15	5	3	20
Total	100	100	100	100	100	100
(N)	(90)	(12)	(13)	(20)	(37)	(172)

Source: Perrine et al., 1971

TABLE T-15

PROPORTION OF MALES AND FEMALES
WITHIN BLOOD ALCOHOL CATEGORIES
FOR DRIVERS INVOLVED IN NON-FATAL
TRAFFIC ACCIDENTS (IN PERCENT)

<u>Sex</u>	<u>Blood Alcohol Content</u>				<u>All</u>
	<u>.00</u>	<u>.01-.04</u>	<u>.05-.07</u>	<u>.08+</u>	
Male	76	86	92	88	78
Female	24	14	8	12	22
Total	100	100	100	100	100
(N)	(4989)	(407)	(132)	(455)	(5983)

a. Includes 17 fatalities

Source: Borkenstein et al., 1964

is especially true of divorced and separated drivers (McCarroll and Haddon, 1962; Borkenstein et al, 1964; Perrine et al., 1971).

Occupational Status

Traffic crashes in general involve larger proportions of blue collar workers than of white collar workers. Moreover, a larger proportion of blue collar workers than of white collar workers were drinking prior to the crash (Borkenstein et al., 1964; Carlson, 1973; Boston University School of Law, 1976).

Summary

From a general descriptive standpoint, data from a number of studies has consistently indicated that traffic crashes of varying degrees of severity involve disproportionate numbers of men and young drivers, aged 16-24. This data has also indicated, although not quite as consistently, that drivers characterized by lower occupational status are involved in large numbers of traffic crashes. The proportion of drivers with different marital status who are involved in accidents varies from study to study, perhaps reflecting the general driving population in that area.

Data on the role of alcohol in accidents involving drivers characterized by these various attributes has revealed that a larger proportion of men, drivers in the middle age ranges, divorced and separated drivers and blue collar workers were drinking prior to the crash than drivers with other characteristics. Taking a different perspective on the data revealed that alcohol-related accidents involve more men than women, and more young drivers, aged 16-24, than drivers in other equivalent age groups.

It should be pointed out once again that the relationships between alcohol, accident-involvement and the demographic variables discussed above are based solely on descriptive data. This data does not take into account differential exposure to accidents or the characteristics of drivers in the population-at-risk. As will be seen in the following discussion of relative probability of crash-involvement, many of these relationships are substantially altered when these factors are included in interpretation of this data.

4. Methodological Constraints

Research on alcohol-involvement in traffic crashes is affected by several measurement and reporting factors. Studies of traffic crashes that use BACs as a measure of alcohol-involvement vary substantially on the proportion of samples of accident-involved persons who are tested for blood alcohol content, and thus on whom research findings are reported. Availability of data on alcohol use for only a certain portion of the entire sample of accident-involved persons, and the unknown biases in the selection processes of persons for which this information is obtained and reported, casts doubt on the representativeness of published data on alcohol-involvement.

In studies of traffic fatalities there are two points at which these selection processes occur. The first is governed by the limitations on the ability to obtain accurate BAC measurements on persons fatally injured in traffic crashes to only a certain period of time after the accident. This period varies across studies, however, from one hour to six hours to twenty-four hours. Thus, all persons who survive longer than the predetermined period of time after the accident are excluded from the sample. In most cases, persons under 15, 16 or 18 years of age are also excluded from the sample as they are assumed not to have been drinking. The remaining traffic fatalities are then considered "eligible" for inclusion in the sample.

At this point a second reduction occurs. Often, for a variety of reasons, only some proportion of these eligible fatalities are tested for blood alcohol content. Both the degree of sample reduction and the reasons for these reductions vary significantly across studies. This second type of sample reduction is also apparent in studies of non-fatal accidents.

There is some indication that systematic biases operate in at least some studies with respect to selection criteria of persons tested for blood alcohol content. For example, different proportions of drivers, passengers and pedestrians, as well as different proportions of drivers in various types of crashes, are tested for blood alcohol content in some studies (Waller et al., 1969; McBay et al., 1974).

In a lengthy review of literature in the alcohol traffic field, Zylman (Zylman, 1974a) has presented evidence that in some studies the proportions of drivers in daytime and in nighttime crashes who were tested for blood alcohol content are quite different. Similarly, all age groups are not consistently tested for BAC. It is Zylman's contention that all of the available evidence indicates that these testing and reporting biases inflate the published figures on alcohol-involvement in traffic crashes, because of the higher proportion of persons tested for blood alcohol content in age groups, types of crashes, and times of the day in which high degrees of alcohol-involvement are usually found. Thus, figures based on only these tested portions of the samples are likely to be higher than if the entire samples were tested.

Moreover, information on the size of the sample of persons involved in traffic crashes in the specified period of time in the specified

area is rarely available. As a result, it is often impossible to determine whether published data is based on a majority of crashes in a given area in a given period of time or merely on some small fraction of all crashes which actually occurred.

Many of these questions concerning the representativeness of data based on these partial samples could be answered if demographic and accident information were published on the proportion of the original or entire sample not tested for blood alcohol content as well as on the proportion tested. From comparisons of this information for the tested and non-tested portions of the sample, an actual judgement of the representativeness of the data would be possible.

Research that relies on police report of drinking is subject to additional problems of representativeness and comparability across studies. Studies have shown that not only do items designed to measure alcohol-involvement on accident reporting forms differ by state (Douglass, 1974), but also that actual police reporting policies of alcohol-involvement in crashes differ radically by jurisdiction (Zylman and Bacon, 1968). Additional data on the degree to which police report of drinking at the time of the crash corresponds to blood alcohol content suggests that although there are inaccuracies in both directions (over-estimating and under-estimating the presence of alcohol in police reports), overall, police reports of alcohol-involvement underestimate the actual degree (as measured by BAC) to which alcohol is present in accident-involved persons (Waller, 1971). Thus, police reports of drinking at the time of the crash are not consistent across studies, nor are they comparable with studies in which alcohol-involvement in crashes is measured by blood alcohol content.

Although hundreds of studies of traffic crashes have been published

in this country alone, and a large number of official files of accident data are on record, the variation in measurement and reporting practices across this body of data makes it difficult to separate substantive factors which may account for some of the variation in alcohol-involvement findings from methodological factors which may be influencing the reported proportion of accident-involved persons who were drinking at the time of the crash. Any attempts to provide standard information on alcohol-involvement in traffic crashes across studies would enhance the possibility of sorting out the relative contributions of these various factors.

B. The Relative Probability or Risk of Accident-Involvement

1. Rationale for Controlled Studies

To assess the role of alcohol or any other factor in traffic crashes, relative exposure to accidents must be controlled for. One way of accomplishing this is based on obtaining similar data on relevant factors from both an accident population and a non-accident population-at-risk. Comparison of the frequency with which any variable is observed in the accident population and in the non-accident population-at-risk or control group yields a rough measure of the relative involvement of this variable in traffic crashes.

Based on these comparisons, calculations can be made of the relative under-representation or over-representation of alcohol or any other variable in the accident sample with respect to its presence in the control sample. For example, if alcohol is observed in a larger proportion of drivers in the accident sample than of drivers in the control sample, it can be said that alcohol is over-represented in the accident sample. If women constitute a smaller proportion of drivers in the accident sample than they do of drivers in the control sample, it can be said that women are under-represented

in the accident sample as compared to their proportion in the control sample.

Comparisons of the accident and control samples can also be used to compute relative probability or relative risk factors associated with accident-involvement. Relative risk factors are often calculated as a ratio by dividing the numerator, the proportion of the accident sample in which a certain variable appears, by the denominator, the proportion of the control sample in which this variable is observed. Thus, referring back to the discussion of over- and under-representation of variables in the accident sample with respect to the control sample, all variables that are under-represented in the accident sample would have a relative risk factor of less than 1.0, while all variables that are over-represented in the accident sample would have a relative risk factor of greater than 1.0. If the variable appeared in equal proportions of the accident and control samples, the relative risk factor for this variable would be 1.0.

A variant of this type of relative risk factor is, however, often seen in the alcohol traffic literature. In this type of relative risk analysis, one value or category of the variable under examination is arbitrarily set at 1.0. For example, when analyzing the relative probability of crash-involvement as a function of BAC, zero blood alcohol is often set at 1.0. The probability of crash-involvement at positive blood alcohol levels is then relative to the probability of crash-involvement at zero blood alcohol. Thus, this analysis is organized not around the actual probability of being involved in a crash as a function of BAC, but rather around the probability of crash-involvement relative to zero blood alcohol.

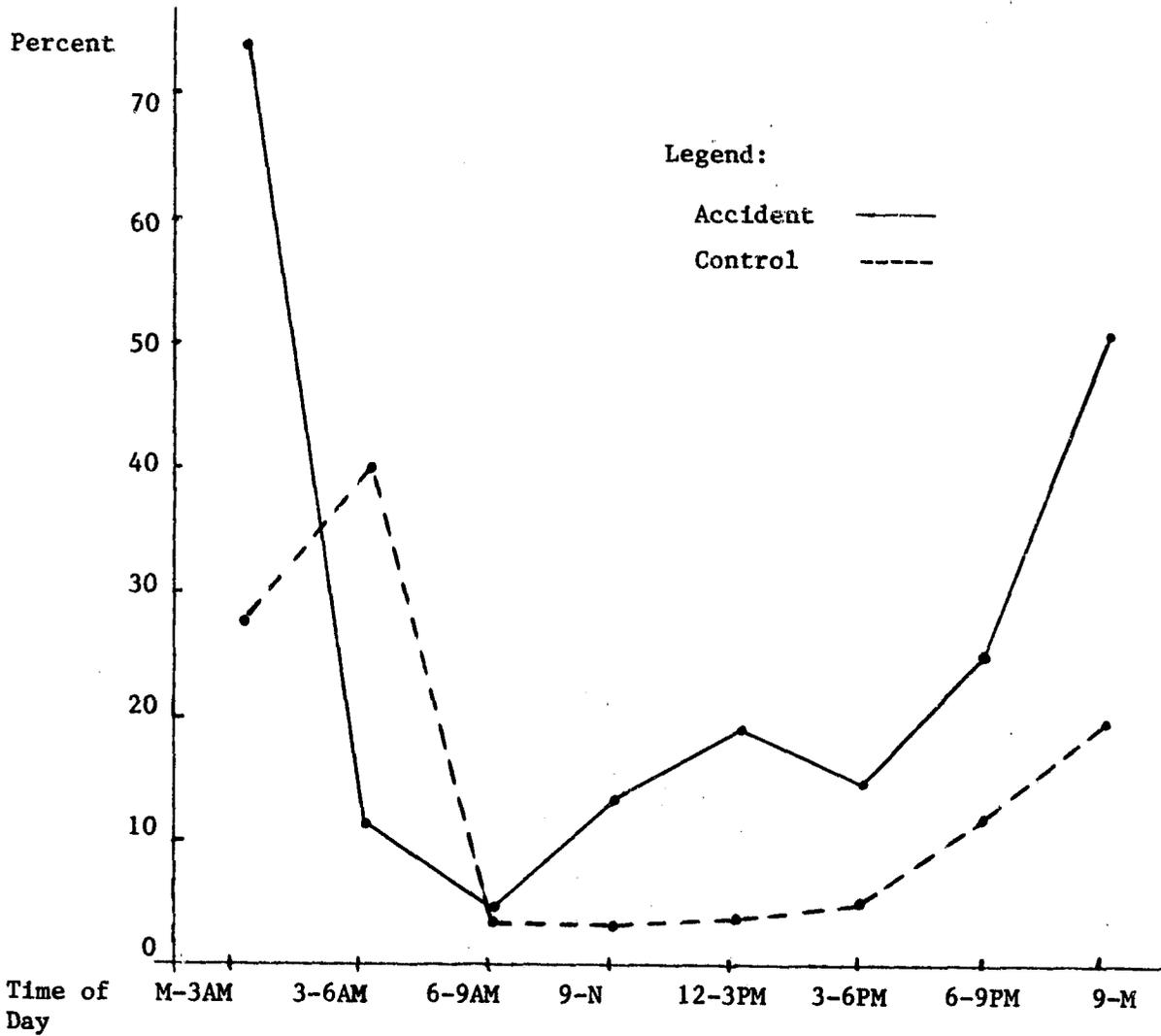
Traditional Relative Risk Studies

Traditionally only seven controlled studies of traffic accidents which meet to varying degrees the criteria for sample design necessary for relative risk analysis have been included in discussion of the relative probability of crash-involvement associated with alcohol level and other situational and demographic factors (Holcomb, 1938; Lucas et al., 1955; McCarroll and Haddon, 1962; Vamosi, 1963; Borckenstein et al., 1964; Biecheler et al., 1970; Perrine et al., 1971).

Strictly defined, the study design necessary for relative risk analysis requires that the control group be matched by time and place to the accident sample. Thus, the control sample in these studies typically consists of non-accident-involved drivers who were using the road at times and places similar to those in which drivers in the accident sample were involved in crashes. However, as Zylman (1971) has pointed out, two of these studies (Holcomb, 1938; and Vamosi, 1963) did not match the control group by specific time and place to the accident sample. Rather, the control sample in these studies was selected at certain locations within the general area in which the accident sample was obtained.

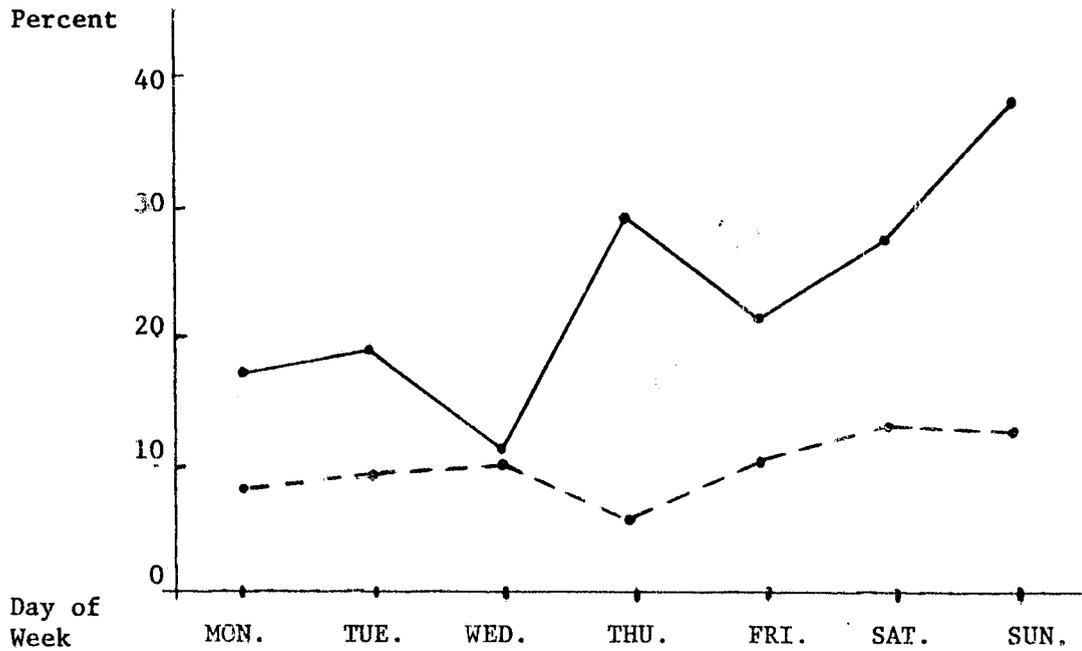
The primary importance of matching the control group by time and place to the accident group can be readily seen in Figures T-10 and T-11. Data presented in these graphs serves as an example of the varied role alcohol plays in traffic crashes over time of day and day of week for both accident-involved drivers and non-accident-involved drivers in the population at risk. Data in these graphs reveals that not only do the proportions of drivers in the accident and control groups who had been drinking vary substantially over time of day and day of week, but also

FIGURE T-10: PROPORTION OF ACCIDENT AND CONTROL DRIVERS WITH POSITIVE BAC (BAC \geq .03%) BY HOUR OF DAY



Source: Farris et al., 1975

FIGURE T-11: PROPORTION OF ACCIDENT AND CONTROL DRIVERS WITH POSITIVE BAC ($BAC \geq .03\%$) BY DAY OF WEEK



Legend:

Accident ———
Control - - - - -

Source: Farris et al., 1975

that the patterning of alcohol-involvement over time of day and day of week is often quite different for accident-involved and non-accident-involved drivers.

Recent Relative Risk Studies

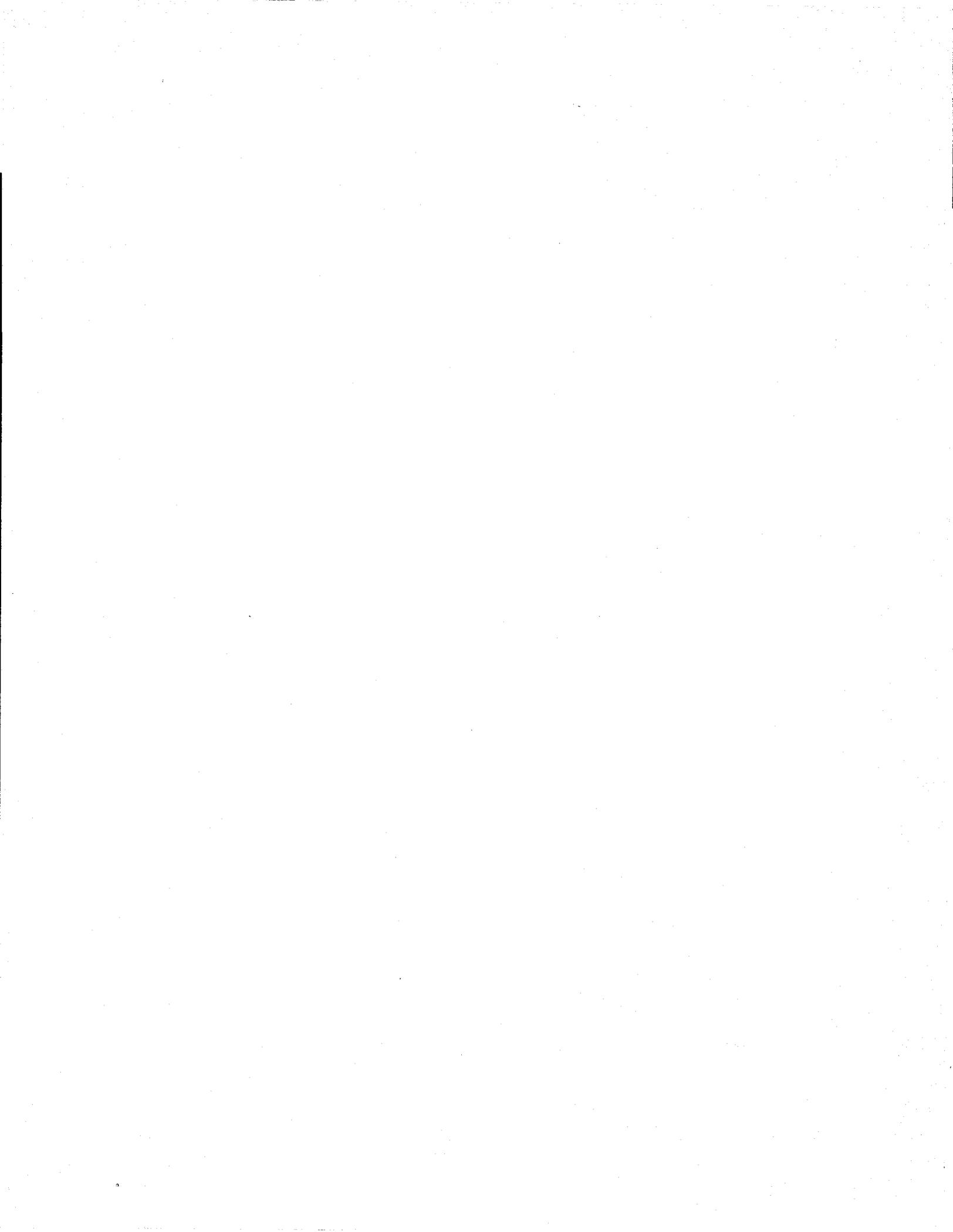
Recently there have been additional studies which lie at various points along the continuum of sample design requirements necessary for relative risk analysis. One of these recent studies (Farris et al., 1975) meets the strict criteria for sample design in relative risk analysis, while the others differ somewhat from this traditional model. For example, with the establishment of the ASAPs in the 1970s, a number of studies (Carlson, 1973; McGuire, 1975) relied on control groups from roadside surveys of non-accident-involved drivers selected in the general area in which the accident samples were selected but not matched specifically to the accident samples by time and place. In another study (Boston University School of Law, 1976) the control group of non-accident-involved drivers was matched to the accident sample not by time and place, but rather by age, sex, and general residential area. Data from these studies, as well as from the traditional relative risk studies, can be used to analyze the relative probability of accident-involvement associated with selected alcohol, demographic, and situational variables. However, as there is a great deal of variation, both methodological and substantive, across all of these controlled studies, caution must be used in comparative analysis of research findings based on these studies.

2. Relative Risk as a Function of BAC

In each of the controlled studies (Holcomb, 1938; Lucas et al., 1955;

McCarroll and Haddon, 1962; Vamosi, 1963; Borkenstein et al., 1964; Perrine et al., 1971; Farris et al., 1975) which collected adequately detailed data on the blood alcohol content of drivers in the accident and control samples, similar results were found on the relative probability of crash-involvement as a function of blood alcohol content. Although these studies differ in both sample design and type of crash studied, each one of these studies found that the relative probability of crash-involvement increased as blood alcohol content increased. At higher levels of blood alcohol content, particularly those in excess of .10%, the relative probability of accident-involvement reached several times that of zero blood alcohol. The general pattern was observed in both rural (Perrine et al., 1971) and urban (McCarroll and Haddon, 1962; Borkenstein et al., 1964) areas; for fatal crashes (McCarroll and Haddon, 1962; Perrine et al., 1971), personal injury crashes (Holcomb, 1938; Farris et al., 1975) and predominantly run-of-the-mill accidents (Borkenstein et al., 1964); for single-vehicle and multi-vehicle crashes (Borkenstein et al., 1964); and for the subpopulation of drivers judged by researchers to be responsible for their crashes (McCarroll and Haddon, 1962; Borkenstein et al., 1964; Perrine et al., 1971; Farris et al., 1975).

Although the same general pattern was observed in each of these controlled studies, noticeable differences exist in the relative probability curves of the various studies. As there are several differences between studies, both methodological and substantive, variation in relative probability curves cannot be attributed to any one factor. However, there are a number of general comparisons of relative probability of crash-involvement as a function of BAC that can be made between certain studies as well as for different subsamples within studies.



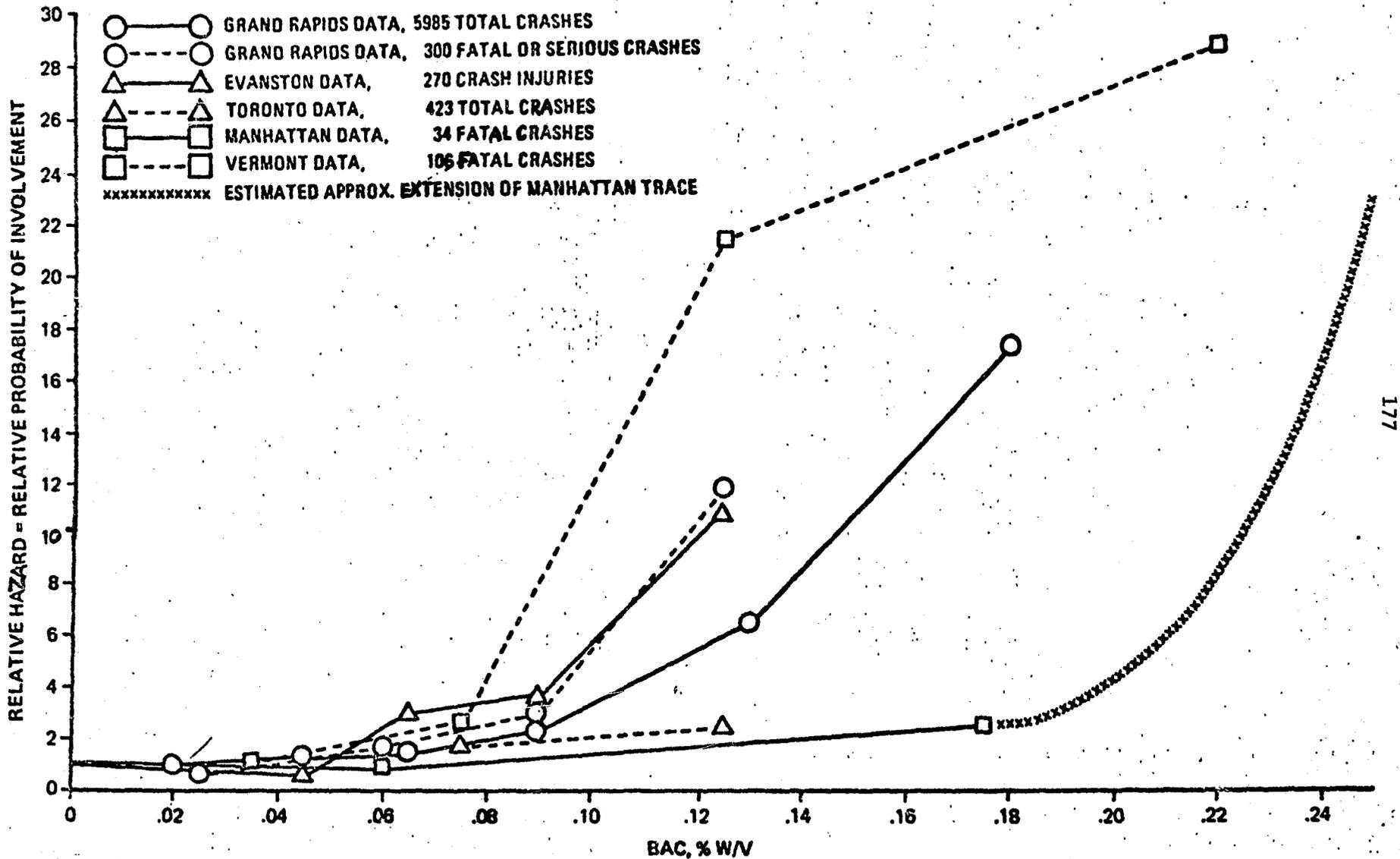


FIGURE T-12.

RELATIVE PROBABILITY OF CRASH INVOLVEMENT AS A FUNCTION OF BAC,
 WHERE 1.0 = RELATIVE PROBABILITY AT ZERO ALCOHOL.

Source: Hurst, 1973

Comparative Data on the Relative Probability of Crash-Involvement

In an extensive review of five of the controlled studies (Holcomb, 1938; Lucas et al., 1955; McCarroll and Haddon, 1962; Borckenstein et al., 1964; Perrine et al., 1971), Hurst (1973) has attempted to correct and adjust for several of the gross methodological differences between studies using Bayesian statistics. Figure T-12 presents Hurst's recalculations of the relative probability curves from the original studies. It can be seen in this figure that there is substantial variation in the slope of the different relative probability curves, and thus, in the relative risk factors associated with particular blood alcohol levels. For example, the relative risk of accident-involvement with a BAC of .10% as compared to zero blood alcohol (set at 1.0) varies from slightly greater than 1.0 in the Manhattan Study (McCarroll and Haddon, 1962) to over 12 times as great in the Vermont Study (Perrine et al., 1971).

The general pattern here, with the exception of the Manhattan study which has an extremely small sample, is one of substantially greater risk of crash-involvement for fatal and serious injury crashes than for total crashes at all blood alcohol levels of .08% or higher. However, as Hurst points out, this can only be considered as tentative since other factors which could contribute to the variation in the relative risk curves also differ across studies.

Comparative Data on the Relative Probability of Causing a Crash

The relative probability of causing a crash is based on comparisons of the control group and the subsample of drivers judged by researchers to be responsible for initiating the crash rather than on the entire accident sample. Figure T-13 presents comparative data from a recent study

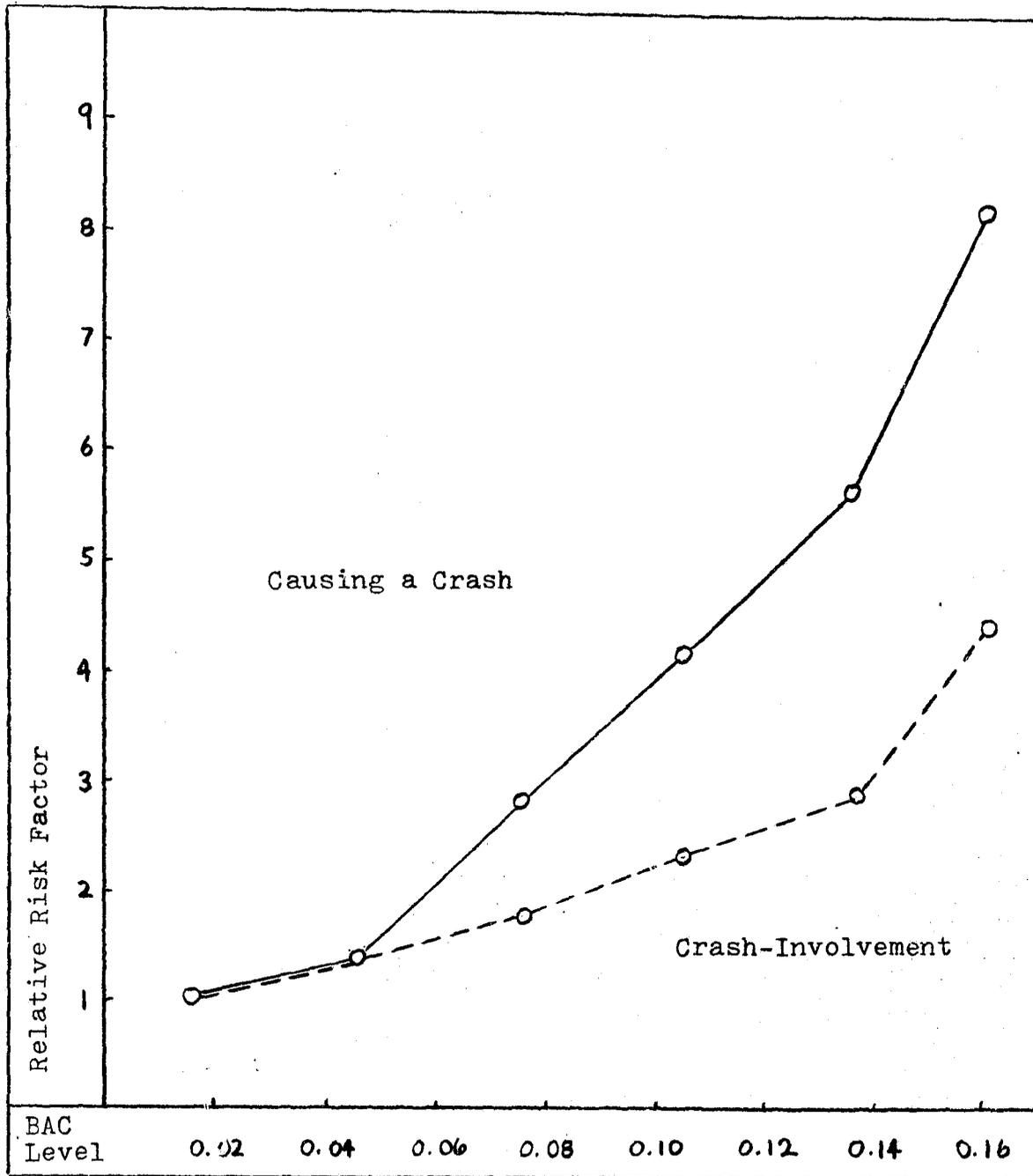


Figure T-13 Relative Probability that a Driver is in a Crash and that a Driver Causes a Crash as a Function of his BAC Level. This Probability is Relative to the Probability that a Driver with a BAC Less than 0.03 is in a Crash or Causes a Crash.

Source: Farris et. al., 1975..

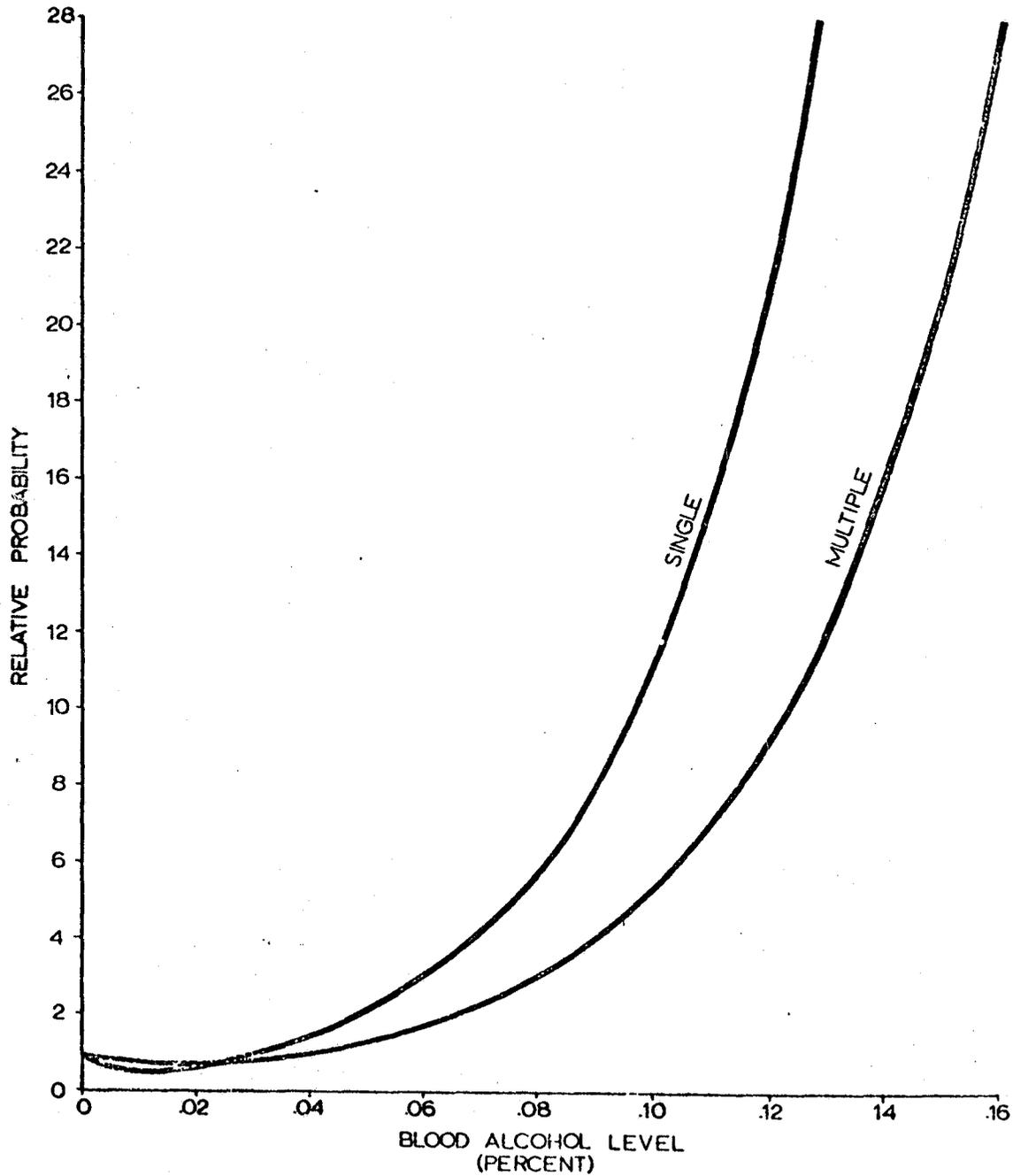


Figure T-14 Relative Probability of Causing Single and Multiple Vehicle Crashes Where 1.0 = Relative Probability at Zero Alcohol

Source: Borkenstein et. al., 1964.

(Farris et al., 1975) on the relative probability of causing a serious injury crash and the relative probability of being involved in this type of crash regardless of responsibility for the accident. This data effectively illustrates that the relative probability of causing a crash is significantly greater than the relative probability of being involved in a crash at all blood alcohol levels in excess of .05%. Thus, at moderate and high blood alcohol levels drivers have a greater risk of causing a crash than of merely being involved in one. The relative risk of causing a serious injury accident is over 8 times as great at BACs of .15% or higher as at blood alcohol levels less than .03% (BAC of <.03% set at 1.0). The relative risk of being involved in this type of crash at BACs of .15% or higher is, in comparison, about 4-1/2 times as great as that at BACs less than .03%.

Comparative data on the relative probability of causing a multi-vehicle crash⁴ and of causing a single-vehicle crash is presented in Figure T-14. This data from the Grand Rapids Study (Borkenstein et al., 1964) indicates that the relative probability of causing a single vehicle crash is greater than the relative probability of causing a multi-vehicle crash at all blood alcohol levels of .04% or higher. The relative risk of causing a single-vehicle crash is 12 times as great at BACs of .10% as at zero blood alcohol (BAC of .00% set at 1.0). In comparison, the relative risk of causing a multi-vehicle crash is about five times as great at BACs of .10% than at zero blood alcohol.

Finally, data from three of the controlled studies (McCarroll and Haddon, 1962; Borkenstein et al., 1964; Perrine et al., 1971) on the relative probability of being responsible for an accident has been compiled by Hurst (1973). In addition, Hurst has calculated the relative probability

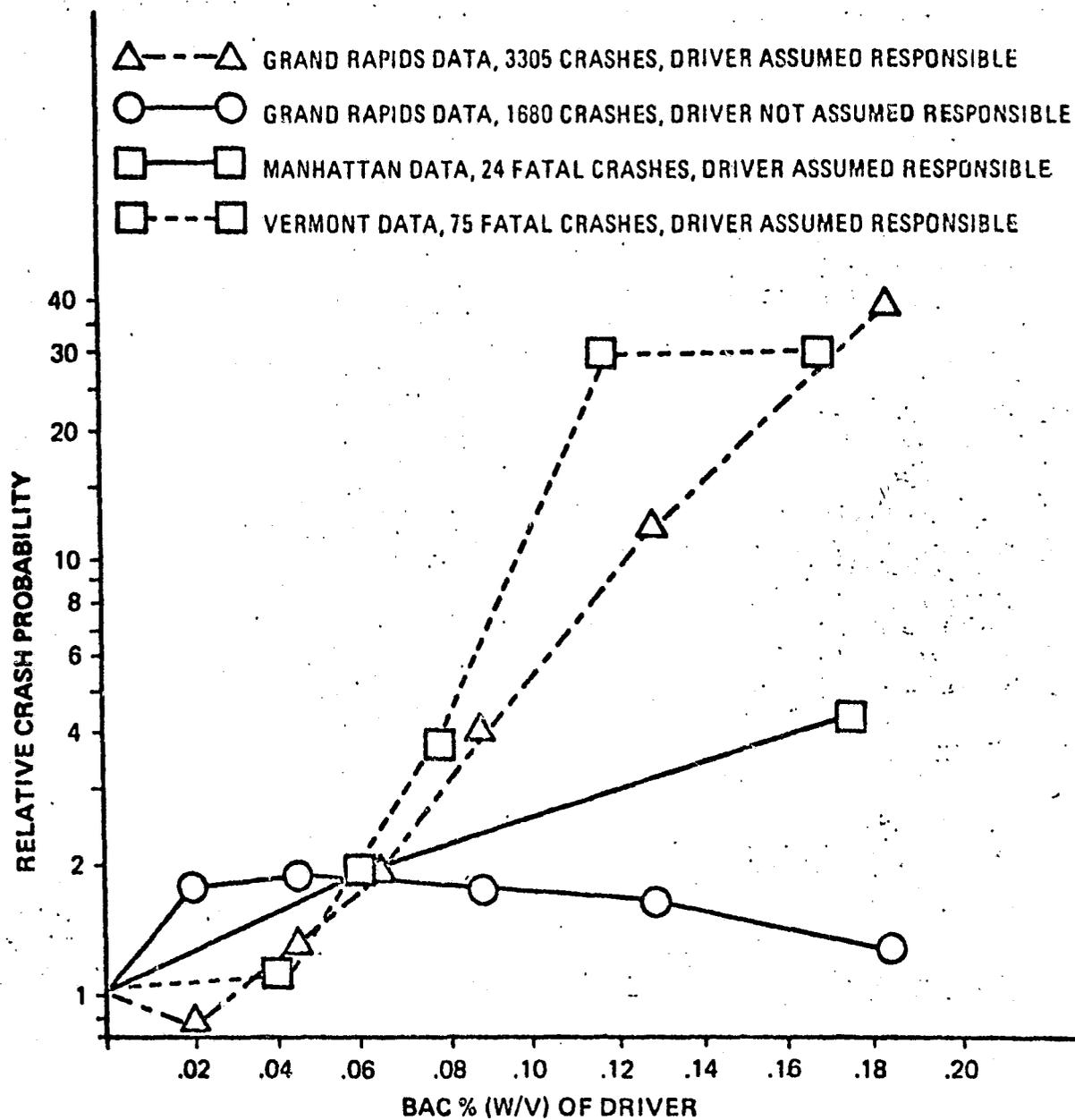


FIGURE T-15 RELATIVE CRASH PROBABILITY FOR DRIVERS ASSUMED RESPONSIBLE AND THOSE NOT ASSUMED RESPONSIBLE AS A FUNCTION OF BAC, WHERE 1.0 = RELATIVE PROBABILITY AT ZERO ALCOHOL.

SOURCE: Hirst, 1973.

of being involved in a crash but not being judged responsible for initiating the accident⁵ based on data in the Grand Rapids Study (Borkenstein et al., 1964). This data is seen in Figure T-15. The difference between the relative probability curves for the three responsible driver groups on the one hand and the relative probability curve for the one group of drivers not assumed responsible for crashes on the other hand is quite apparent. Whereas all three responsible driver curves are steep, the curve for drivers not assumed responsible is rather flat. This data indicates that the relative risk of being responsible for a crash at BACs of .10% varies from slightly less than 3 times as great to about 15 times as great as the relative risk at zero blood alcohol (BAC of .00% set at 1.0). In contrast, the relative risk of being involved in an accident but not judged responsible for the crash is only about 1.6 or 1.7 times as great at all positive levels of blood alcohol as at zero blood alcohol. Thus, the relative risk of being involved in an accident but not being identifiable as the responsible party seems to increase by about 60% when drinking, regardless of amount consumed (Hurst, 1973).

Summary

The preceding discussion has at least tentatively indicated that the relative probability of accident-involvement is apparently greater for fatal and serious injury crashes than for total crashes at all moderate and high levels of blood alcohol content. Research has also shown that the relative probability of causing a crash is significantly greater than the relative probability of simply being involved in an accident at all moderate and high levels of blood alcohol content.

Data has also indicated that the relative probability of causing a single-vehicle crash is greater than the relative probability of causing a multi-vehicle crash at all levels of blood alcohol content in excess of .04%. Lastly, research has shown that at all moderate and high levels of blood alcohol content, the relative probability of being responsible for a crash is considerably greater than the relative probability of being involved in a crash but not being assumed responsible for the accident.

3. Relative Risk Over Time of Day

Data from a number of controlled studies has demonstrated the changing nature of the relative probability of accident-involvement as a function of alcohol and various situational and demographic factors. For example, Zylman (1968) has presented data from the Grand Rapids study (Borkenstein et al., 1964) that indicates that the relative probability of accident-involvement associated with certain blood alcohol levels changes markedly over time of day. Although the accident-involvement of drivers with no measurable blood alcohol and those with BACs of .08% or higher is relatively constant over time of day, the relative probability of accident-involvement of drivers with BACs from .01% to .07% varies widely over time of day.

Drivers with no measurable blood alcohol were involved in fewer accidents than expected on the basis of their proportion in the control group at all times of the day and drivers with BACs of .08% or higher were involved in more accidents at all times of the day than expected. However, drivers with BACs of .01% to .04%, although under-represented in accidents over the entire 24 hour period when times of the day were not analytically disaggregated, were over-represented in crashes during the hours of dense

traffic, 6-9 a.m. and 3-6 p.m. At all other times of the day, they were under-represented. Drivers with BACs of .05% to .07% were over-represented in crashes overall when times of the day were not disaggregated. But when time periods were analyzed separately, these drivers were under-represented in accidents from midnight to 3 a.m.

This data suggests that the relative probability associated with moderate blood alcohol levels, at least for drivers in this study, is considerably different at various hours throughout the day. Zylman attributes this variation to the density of traffic and the changing characteristics of drivers in the population-at-risk (Zylman, 1971). He further suggests that statements such as the following, "When the alcohol level reaches .06%, the probability of causing an accident is twice that of the no-alcohol level and at .10% the probability is six times greater," may actually be underestimates of the role of alcohol in traffic crashes for some combinations of time, traffic density, and driver characteristics and overestimates for other such combinations (Zylman, 1971).

Zylman has presented additional data from the Grand Rapids study that indicates that the demographic characteristics of accident-involved and non-accident-involved drivers change substantially over time of day (Zylman, 1968). For example, overall, in the entire 24 hour period, drivers 25-34 years of age were involved in fewer crashes than would be expected from their representation in the population-at-risk. Similarly, when times of the day were analytically disaggregated, this group was under-represented in accidents at all time periods of the day, except in the hours between midnight and 6 a.m., during which these drivers were over-represented in crashes. This tendency for the relative probability of accident-involvement for different demographic subpopulations to vary over time of day was also

observed with respect to other demographic characteristics including sex and driving patterns (annual mileage). Hence, data from the Grand Rapids study indicates that the relative probability of accident-involvement associated both with particular blood alcohol levels and with demographic characteristics of drivers changes markedly over time of day.

4. Relative Risk as a Function of Demographic Factors

Age

There is also evidence that the relationships of relative probability of crash-involvement and various demographic characteristics are more consistent across these controlled studies for some demographic variables than others. For example, the relative probability of accident-involvement associated with different age groups is generally consistent across studies. A general pattern indicates that drivers at both ends of the age spectrum are involved in greater numbers of both fatal and non-fatal traffic crashes than can be accounted for solely by their exposure to accidents. For example, drivers less than 25 years of age and those 60 years or older were over-represented in predominantly non-fatal crashes in the Grand Rapids Study (Borkenstein et al., 1964). Similarly, drivers under 20 years of age and those 70 years or older were over-represented in fatal crashes in the Vermont study (Perrine et al., 1971). Various additional studies (Carlson, 1973; Farris et al., 1975) have also found this same trend.

Sex

The statistical association between the sex of drivers and relative probability of crash-involvement varies somewhat across studies. A general pattern in the strictly controlled relative risk studies finds women slightly over-represented in non-fatal traffic crashes, while men are slightly under-

represented using the control group as a standard of measurement (Borkenstein et al., 1964; Farris et al., 1975). The opposite pattern is found, however, in fatal crashes. Women are under-represented in crashes and men are over-represented with respect to their proportions in the control group. This pattern is fairly well substantiated by additional, less strictly controlled studies which have found women under-represented and men over-represented in fatal crashes (McGuire, 1975) and in nighttime single-vehicle crashes (Carlson, 1973).

The trend in this data, then, reveals that women are under-represented in fatal and nighttime crashes, but over-represented in non-fatal crashes. The opposite is, of course, true for men. This general pattern tends to conform to available knowledge on the driving habits and social customs associated with the two sexes. Men drive more at night than women. Women do most of their driving during the day. As fatal crashes occur mainly at night, it is not surprising to find men over-represented in these accidents. And as non-fatal crashes occur mainly during the daytime hours, it is not surprising to find women over-represented in this type of crash.

Although relative risk analysis controls for exposure to crashes over time of day, it would seem that the above trends in the data have sufficient strength to remain statistically significant over and above variation accounted for solely by exposure to accidents.

Marital Status

Relative probability of accident-involvement associated with marital status is generally consistent across studies at the most broadly defined level, that of married versus non-married, but is somewhat inconsistent for more narrowly defined categories of marital status. Married drivers are

involved in fewer accidents than expected on the basis of their proportion in the control group, while non-married drivers are involved in larger numbers than expected (McCarroll and Haddon, 1962; Borkenstein et al., 1964; Perrine et al., 1971; Boston University School of Law, 1976). Within the non-married group, however, there is some inconsistency.

In general, single drivers are over-involved in traffic crashes (Borkenstein et al., 1964; Perrine et al., 1971). However, divorced and separated drivers were over-involved in non-fatal crashes in the Grand Rapids study (Borkenstein et al., 1974) and the hospitalized crash group in the Vermont study (Perrine et al., 1971), but were, in contrast, under-represented in the fatality sample in the Vermont study. Once again, this data seems, at least tentatively, to suggest that drivers in fatal and non-fatal crashes may come from somewhat different segments of the driving population.

Occupational Status

The relationship of occupational status and relative probability of crash-involvement is the most inconsistent of the four demographic relationships discussed in this section. In some studies (Borkenstein et al., 1964; Farris et al., 1975) lower occupational status groups were over-involved in crashes and higher status groups were under-involved in accidents based on their representation in the control group. However, in a number of other studies (McCarroll and Haddon, 1962; Perrine et al., 1971) no overall statistical significance was found for relative probability of crash-involvement and occupational status.

5. Relative Risk as a Joint Function of BAC and Demographic Factors

When alcohol is added to the relationship of demographic characteristics and relative probability of accident-involvement, a general pattern emerges across all of these studies: the relative probability of being involved in a crash increases as blood alcohol content increases within all categories of demographic variables. Thus, for both men and women, different age groups, both married and non-married drivers, and those with high and low occupational status, the relative probability of crash-involvement increases as blood alcohol increases. There is, however, considerable variation across studies on the actual relative risk factors associated with specific blood alcohol levels and specific demographic characteristics.

Although the relative probability of crash-involvement increases as blood alcohol content increases for all drivers regardless of their demographic characteristics, the specific relative risk of crash-involvement associated with blood alcohol content is much greater for certain demographic groups than for others. For example, data from the Grand Rapids study on the interrelationship of alcohol, age, and relative probability of crash-involvement, as re-analyzed by Zylman (1972), suggests that the relative probability of accident-involvement associated with blood alcohol content is markedly different for various age groups. This data is presented in Figure T-16. It can be seen from this data that at all blood alcohol levels, male drivers in the age ranges of 18-24 and 65 and older have a higher relative risk of being involved in a crash than male drivers in the middle age ranges. As blood alcohol content increases, this pattern is accentuated, with the relative risk of accident-involvement increasing more sharply for both very young and very old drivers than for middle-aged drivers. This data suggests, then, that similar levels of blood alcohol content apparently have a differential

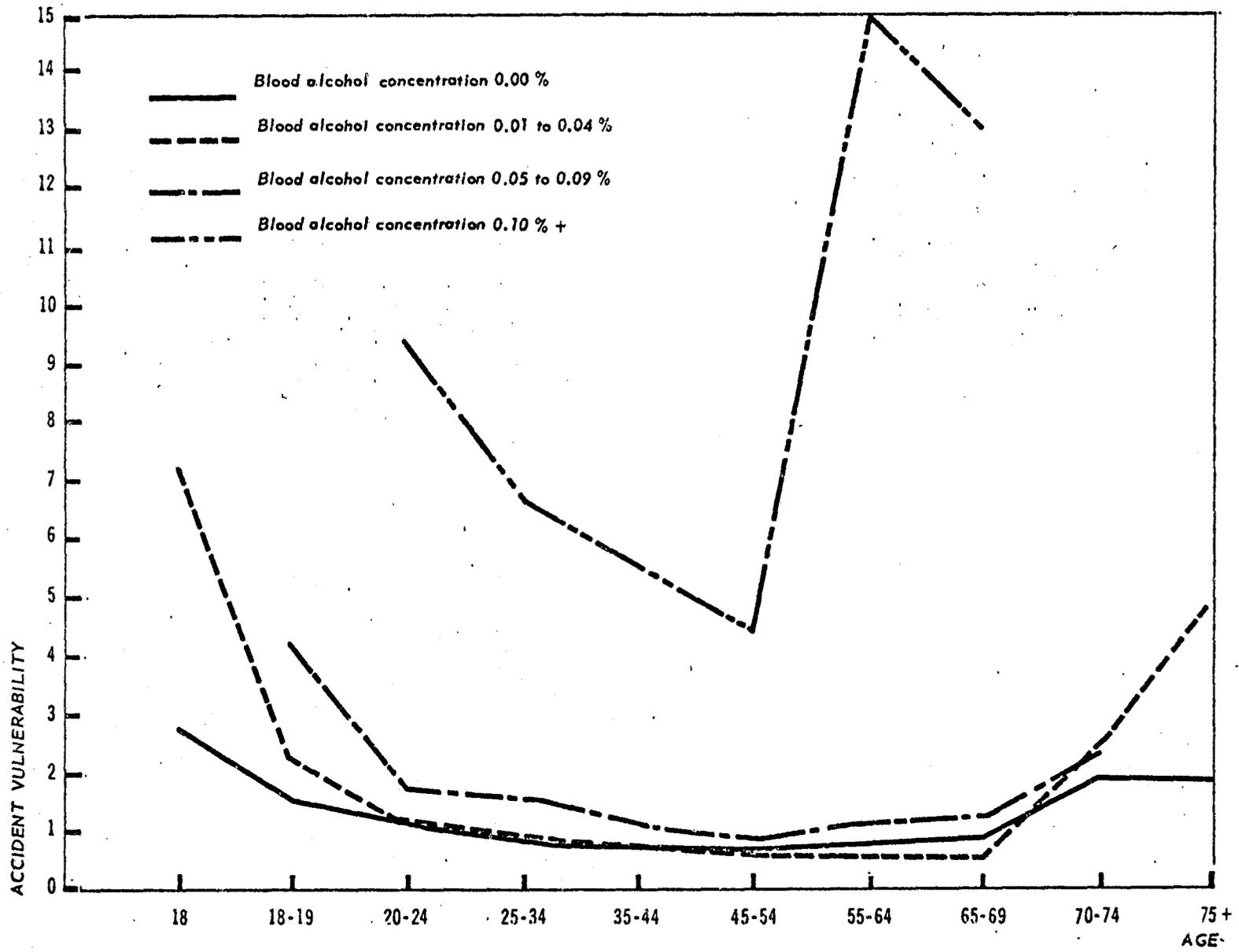
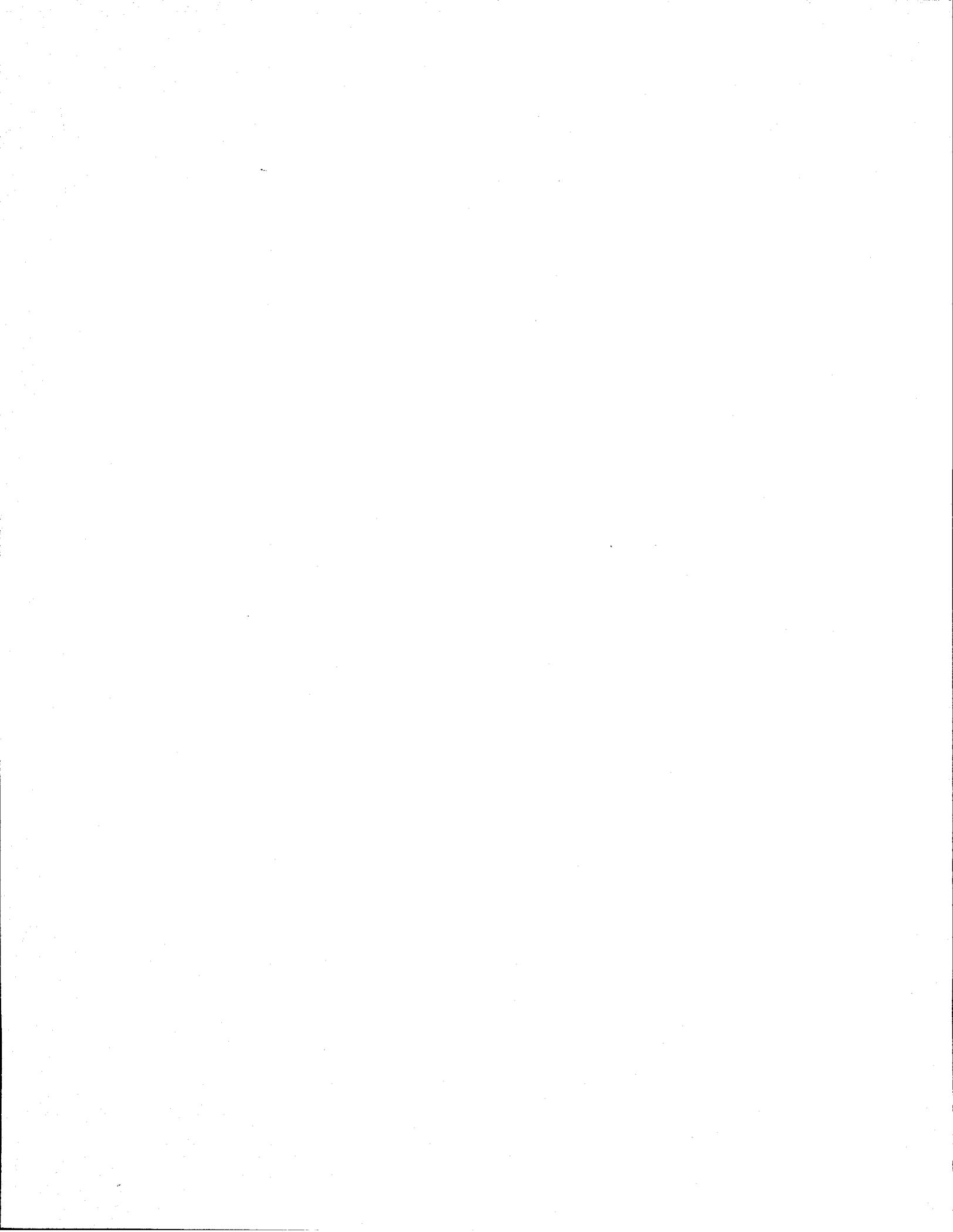


FIGURE T-16. Accident Vulnerability as a Function of Age and Blood-Alcohol Concentration in Men.

SOURCE: Zylman, 1972



effect on relative risk of accident-involvement for different age groups. It also tends to indicate that relative risk of accident-involvement begins to increase at lower blood alcohol levels for drivers at both ends of the age spectrum than for middle-aged drivers.

A similar patterning of the relationship between alcohol, age, and relative probability of crash-involvement was apparent in a number of the other controlled studies (Perrine et al., 1971; Farris et al, 1975). However, the specific relative risk factors associated with various age groups in the higher blood alcohol levels are significantly larger in some studies than in others. Thus, it is impossible to generalize across studies and associate any one relative risk factor with a given demographic subpopulation at a given blood alcohol level. However, it is of course possible to observe general trends across these studies.

Data presented from a number of controlled studies clearly indicates that the relative probability of accident-involvement is not stable over time of day or constant for different demographic subpopulations. The numerous differences between studies, as well as those within studies, on the relationship of alcohol and relative probability of crash-involvement suggest that traffic crashes are extremely complex events.

The one clear finding, however, that emerges consistently from this body of data is that as blood alcohol content increases, relative probability of accident-involvement increases. This relationship, although different in terms of specific relative risk factors for various situational and demographic variables, has held true across studies for a substantial number of populations, types of crashes, and areas of this country and other countries.

III. DRINKING PATTERNS, TRAFFIC ACCIDENTS AND VIOLATIONS

In the previous section various characteristics of accident-involved drivers were analyzed in an effort to identify the kind of driver who becomes involved in traffic crashes in general and in alcohol-related crashes in particular. Thus far, however, consideration of the role of alcohol in traffic crashes has been focused solely on whether or not the accident-involved driver was drinking immediately prior to the crash. Additional data presented in this section will focus on the typical drinking patterns of drivers who become involved in traffic accidents. Specific interest will be focused on the association between these typical drinking patterns and actual drinking at the time of the crash.

Data discussed in this section will include both frequency and amount of drinking on the part of accident-involved drivers and their control group counterparts, as well as the frequency with which driving after drinking typically occurs in both of these groups. Evidence will be brought to bear on questions concerning what proportion of crashes, and specifically of alcohol-related crashes, involve frequent or infrequent drinkers or those who drink light, moderate or heavy quantities of alcoholic beverages. Discussion will be directed toward additional questions as to whether the association, if any, between drinking patterns and accident-involvement is moderated by inexperience with drinking, reported frequency of driving after drinking or any other circumstantial factors.

Discussion in this section will begin with the relationship of drinking patterns and overall involvement in crashes and violations. A discussion of alcohol-specific accidents and violations will then follow. Data specifically concerning the role of alcoholics and problem drinkers in traffic crashes will be the focus of subsequent sections.

Detailed and systematic data on drinking patterns of accident-involved drivers or other traffic violators is available from only a small number of studies, the bulk of which are the case-control studies which have been referred to in the previous section. Although this limited number of studies does not adequately support broad generalizations, data from these studies is sufficiently detailed so as to provide several interesting findings concerning the relationship between drinking patterns, driving after drinking, and accident-involvement, and may well serve as a foundation for future research. A note of caution in interpreting these findings is, however, suggested. The data on drinking patterns and frequency of driving after drinking presented in this section is based on self-reported information or on relevant testimony from family members, and thus it may reflect the inevitable biases of this type of data. In addition it should be noted that direct comparison of data between these studies is made difficult by the large degree of variation in both the quantity and frequency measures of drinking employed across studies.

A. Overall Involvement in Traffic Accidents and Violations

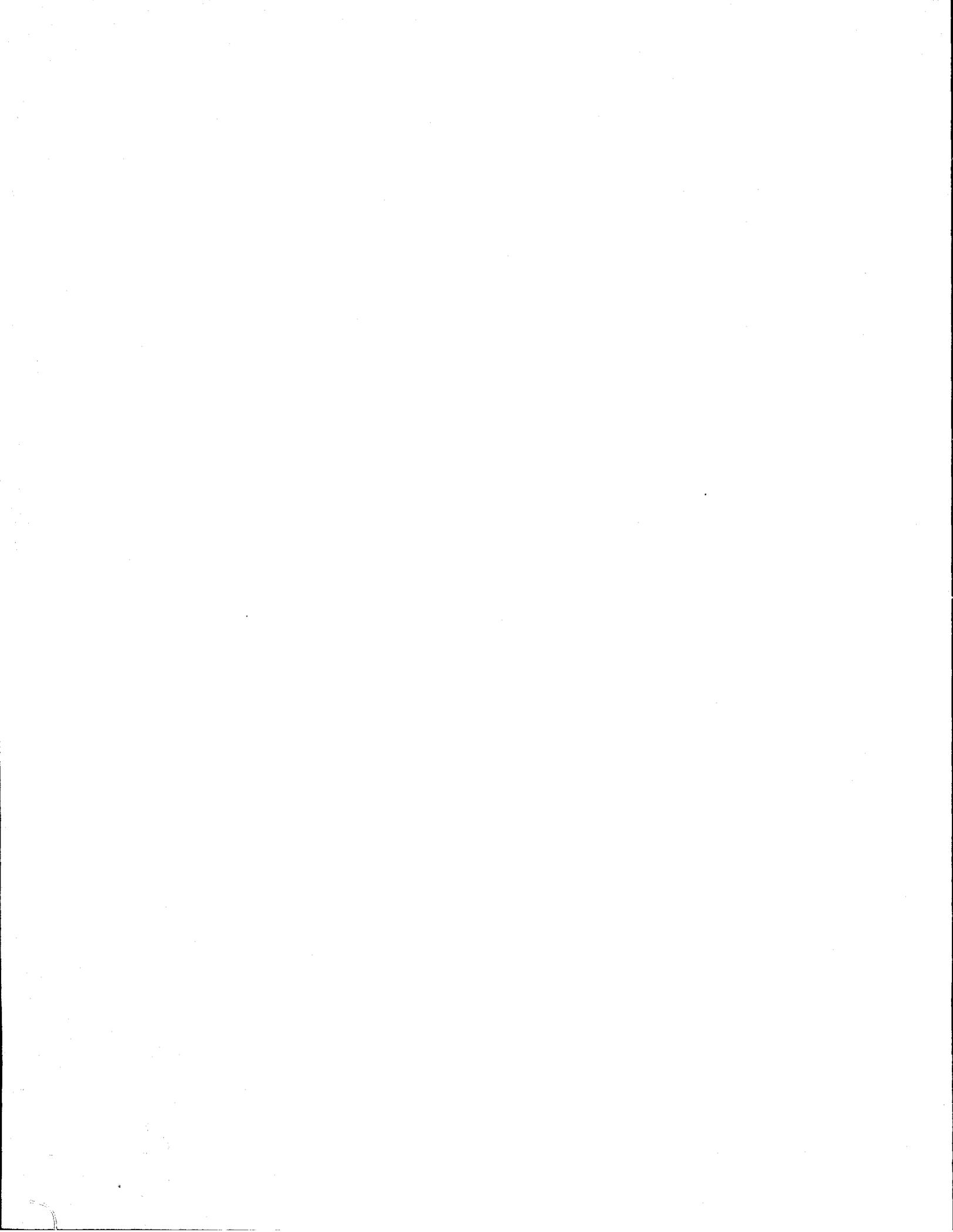
1. Drinking Frequency

Beginning with the most basic question -- is drinking as opposed to abstinence associated with overall involvement in traffic accidents?-- data from a recent controlled study of injury-producing accidents (Farris et al., 1975) would indicate that it is not. As seen in Table T-16, this study found that 43% of the accident group and 40% of the matched control group reported that they abstain from drinking alcoholic beverages. When this difference between groups was tested for statistical significance, it was found non-significant. The authors concluded that drinking as opposed to abstinence, in itself, does not play a major role in injury-producing accidents (Farris

TABLE T-16
DRINKING FREQUENCY FOR ACCIDENT AND CONTROL GROUPS IN PERCENT

	Base N	% Abstain or Rarely Drink	% Drink Monthly	% Drink Weekly	% Drink Daily	Total
Borkenstein et al., 1964						
Accident Group	6266	45	18	32	6	101
Control Group	7288	41	15	34	10	100
Perrine et al., 1971						
All Alcoholic Beverages						
Fatal Crash Group	33	21	----- 79 -----	-----	-----	100
Hospitalized Crash Group	35	21	----- 79 -----	-----	-----	100
Roadblock Control Group	1144	16	----- 84 -----	-----	-----	100
Beer ^a						
Fatal Crash Group	33 (24)	27 (--)	12 (17)	9 (13)	52 (71)	100
Hospitalized Crash Group	35 (24)	31 (--)	29 (42)	17 (25)	23 (33)	100
Roadblock Control Group	1014 (680)	33 (--)	16 (24)	24 (35)	27 (41)	100
Liquor ^a						
Fatal Crash Group	33 (21)	36 (--)	36 (57)	18 (29)	9 (14)	99
Hospitalized Crash Group	35 (26)	26 (--)	49 (65)	11 (15)	14 (19)	100
Roadblock Control Group	914 (506)	45 (--)	26 (48)	15 (26)	14 (26)	100
Farris et al., 1975						
Accident Group	610	43	----- 57 -----	-----	-----	100
Control Group	815	40	----- 60 -----	-----	-----	100
Boston U Law School, 1976						
Accident Group	267	10	14	39	37	100
Control Group	801	14	15	33	38	100

a. Numbers in parenthesis exclude abstainers of that particular alcohol beverage.



et al., 1975).

Three additional studies, presented in Table T-16, have provided more detailed data on the association between drinking frequency and accident-involvement (Borkenstein et al., 1964; Ferrine et al., 1971; Boston University School of Law, 1976). It must be noted initially that the ratio of drinkers to non-drinkers differs quite noticeably between studies reported in this table. While two of the studies (Borkenstein et al., 1964; Farris et al., 1975) reported that 40-45% of drivers in both the accident and control groups abstain or rarely drink alcoholic beverages, the remaining two studies (Ferrine et al., 1971; Boston University School of Law, 1976) report substantially lower figures, approximately 10-20% overall.⁶ These differences between studies may reflect either regional variation in drinking practices or, on the other hand, variation in sample design and methodology. Although differences between accident and control groups with respect to whether drivers typically abstain or drink alcoholic beverages were not specifically tested for statistical significance in these three studies, a review of the data indicates that these differences are all quite small.

Turning to the more detailed data in Table T-16 on the association of drinking frequency and accident-involvement, an analysis of this data indicates that results in this area have been mixed. In the most recent study (Boston University School of Law, 1976), differences in drinking frequency between a group of drivers judged most responsible for fatal traffic accidents and a control group matched by age, sex and residential area were found not statistically significant. Thus in this study the frequency with which drivers typically drink alcoholic beverages was not associated with involvement in traffic crashes.

In a second study (Perrine et al., 1971), the relationship between drinking frequency and accident-involvement was analyzed separately for beer and liquor consumption. Results indicated that frequency of liquor consumption was not significantly associated with involvement in either serious injury or fatal accidents. Frequency of beer drinking was, on the other hand, significantly related to involvement in fatal crashes. Significantly larger proportions ($p < .01$) of drivers who drank beer did so daily in the fatally injured group (71%) as compared to those in either the roadblock control group (41%) or the hospitalized crash group (33%)⁷. These findings indicate that in terms of the frequency of both liquor and beer consumption, drivers in serious-injury accidents are similar to non-accident-involved drivers. However, fatally injured drivers, while similar to non-accident-involved drivers in terms of frequency of liquor consumption, are comparatively more often frequent beer drinkers.⁸

Differences in drinking frequency between accident-involved drivers and their roadside control group counterparts were also statistically significant ($p < .05$) in a study of predominantly non-fatal accidents in Michigan (Borkenstein et al., 1964). The relationship between drinking frequency and accident-involvement in this study was, however, the opposite of that found in the previous study. Borkenstein and associates found that drinking frequency was inversely related to accident-involvement, with daily and weekly drinkers involved in less accidents than expected based on their proportions in the control group, and less frequent drinkers involved in more accidents than would be expected.

A possible explanation of this finding offered by the authors centers on the distributions of additional characteristics associated with accident-involvement (i.e., age, sex, education, annual mileage), which are measured concurrently with those of drinking frequency. Subsequent analysis revealed that the daily drinking class was characterized by large numbers of drivers with attributes such as high annual mileage, middle-age and higher educational attainment, all characteristics associated with low accident-involvement. The reverse was true for the least frequent drinking class. These drivers were characterized by large numbers of the very young and very old, persons who drove less than 1,000 miles annually, single drivers and those with less education, characteristics associated with high accident-involvement. Thus, this interpretation contends that frequent drinkers experienced low accident-involvement, while infrequent drinkers experienced high accident-involvement, as a result of attributes other than or in combination with drinking frequency.

This combination of factors does, however, also lend support to the theory that it is inexperience with drinking, both in terms of infrequent drinking and in terms of the newness of the drinking experience for younger drivers, that plays a significant role in increased accident-involvement.

An overall comparison of the four studies discussed above reveals a considerable degree of variation, both in terms of the frequency with which drivers in the accident and control groups drink and with respect to the statistical significance and direction of the association between drinking frequency and accident-involvement. As both infrequent and frequent drinkers have been statistically linked to over-involvement in traffic crashes, conclusions as to the relationship between drinking frequency and overall involvement in crashes cannot yet be ascertained.

2. Quantity of Alcoholic Beverages Consumed

A similar situation exists with respect to the association between quantity measures of drinking behavior and accident-involvement. In a recent study of injury-producing accidents (Farris et al., 1975) comparative data on the mean number of drinks usually consumed per sitting by both accident-involved drivers and those in a roadside control group were analyzed. While the accident and control groups did not differ significantly in the proportion of drinkers in each group (See Table T-16), data from this study indicates that of those drivers that did drink, those in the accident group drank more per occasion than those in the control group. The mean number of drinks per sitting was 3.04 for the accident group and 2.66 for the control group. While this difference was not large, it was statistically significant.

Additional data from this study on the proportion of drivers who drank differing amounts of alcoholic beverages revealed that a larger percentage of drivers in the accident group than in the control group were heavy drinkers (4 or more drinks per sitting) and conversely, that a larger percentage of control drivers than of accident drivers were light drinkers (less than 2 drinks per sitting).

In contrast, in a second study (Perrine et al., 1971), there were no statistically significant differences reported between accident and control groups with respect to quantity of alcoholic beverages consumed. Analysis of the association between beer consumption and accident-involvement revealed that of those who drank beer, 17% of fatally injured drivers, 17% of hospitalized drivers and 14% of control group drivers were heavy beer drinkers (5 or more bottles per sitting). Of those who drank liquor, 14% of fatally injured drivers, 15% of hospitalized drivers and 8% of control group drivers were heavy liquor drinkers (5 or more drinks per sitting).

3. Quantity/Frequency Patterns Of Drinking Behavior

Turning to combined measures of quantity and frequency of drinking, results are again mixed, although several studies provide interesting findings concerning the relationship between different types of drinking behavior and various sorts of accident experience. For example, in a recent study of drivers judged responsible for fatal crashes (Boston University School of Law, 1976), both overall drinking patterns and frequency of intoxication were analyzed in terms of their association with accident-involvement. Differences between the accident and control groups with respect to overall drinking patterns, ranging from abstainer to alcohol abuser, were not statistically significant.

On the other hand, differences between groups with respect to frequency of intoxication, a more subjective measure of alcohol use, were statistically significant ($p < .01$). As seen in Table T-17, accident-involved drivers were intoxicated significantly more often than control group drivers. Additional data presented in this table reveals significant variation in frequency of intoxication between drivers in different types of accidents. Results indicate that drivers who were frequently intoxicated comprised a significantly higher proportion of drivers who were responsible for their own fatal injury or that of another vehicle occupant, as compared to drivers in the control group or those who were responsible for a pedestrian fatality. This data indicates that in terms of frequency of intoxication, drivers who fatally injured pedestrians were more like the control group than like the other accident-involved drivers.

A second study (Perrine et al., 1971) which analyzed the association between drinking patterns and accident-involvement found that of those drivers in each group who drank alcoholic beverages, 23% of fatally injured

TABLE T-17
 FREQUENCY OF ALCOHOL INTOXICATION
 FOR ACCIDENT AND CONTROL GROUPS
 IN PERCENT

<u>Annual Frequency of Alcohol Intoxication</u>	<u>Accident Group</u>				<u>Control Group</u>
	<u>I^a</u>	<u>II^b</u>	<u>III^c</u>	<u>All</u>	<u>All</u>
Never	17	13	28	21	35
1-2 times	22	27	21	23	28
3-8 times	22	19	26	23	14
≥ Monthly	11	11	11	11	14
< Weekly	20	19	12	16	7
≥ Weekly	8	11	2	6	2
Total	100	100	100	100	100
(N)	(103)	(63)	(101)	(267)	(801)

- a. Drivers responsible for their own fatal injury.
- b. Drivers who survived the crash but were responsible for fatally injuring another vehicle occupant
- c. Drivers who survived the crash but were responsible for fatally injuring a pedestrian

Source: Boston University School of Law, 1976

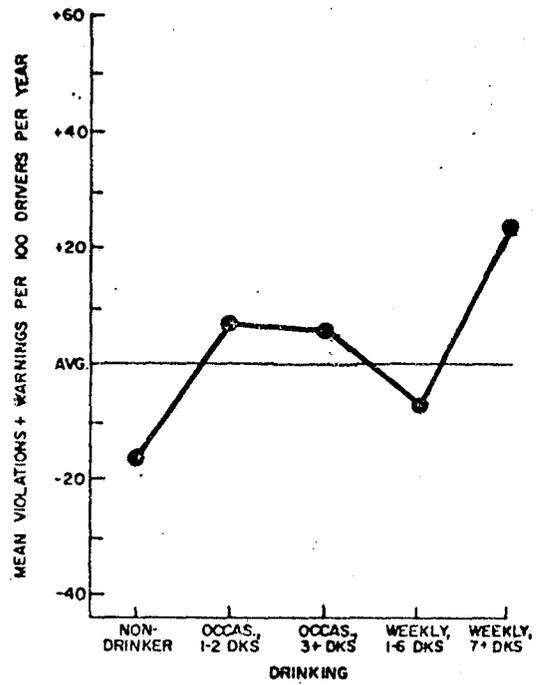
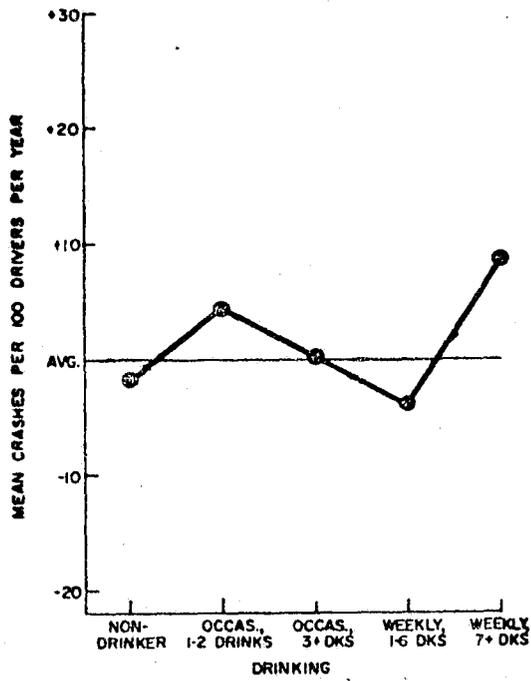
drivers, 23% of hospitalized drivers and 12% of roadblock control drivers were considered heavy drinkers in terms of their most preferred beverages. Although the statistical significance of these differences between groups was not reported, the data does indicate that the percentage of accident-involved drivers who were considered heavy drinkers is almost twice as large as that of control group drivers.

Several interesting findings concerning the inter-relationship of drinking patterns, traffic crashes, violations and warnings were revealed in a general population study focusing primarily on young male drivers (Pelz, 1973; Pelz and Schuman, 1974 ; Pelz et al. 1975; Pelz and Williams, 1975), a group well-known for its high rate of accident-involvement. Relevant information was obtained from 1,700 young men, aged 16-24, in a representative sample of households in southeastern Michigan. Self-reported accidents, violations and warnings, as well as official state files of accidents and violations during the past year were analyzed for all drivers.

As seen in Figure T-17, after adjustment for exposure to accidents and violations,⁹ drinking patterns were found only mildly related ($p < .10$) to traffic crashes, but were significantly ($p < .01$) related to violations-plus-warnings (referred to as violations for the remainder of the discussion). Although not highly significant, the accident data revealed a trend showing that young men at both extremes of the drinking continuum, those who drank heavily every week and those who were occasional light drinkers, had more crashes than average, while non-drinkers, occasional moderate drinkers, and weekly moderate drinkers, had average or below average crash rates (Pelz and Schuman, 1973a).

FIGURE T-17

CRASH AND VIOLATION RATES BY DRINKING CLASS FOR YOUNG MEN AGED 16 TO 24



Source: Pelz and Schuman, 1974

With respect to violations, the previous pattern appears accentuated. Heavy weekly drinkers had a substantially greater than average number of violations, while non-drinkers had a considerably less than average number. As was the case with accidents, the weekly moderate drinker had a better than average record, revealing fewer violations (Pelz and Schuman, 1974).

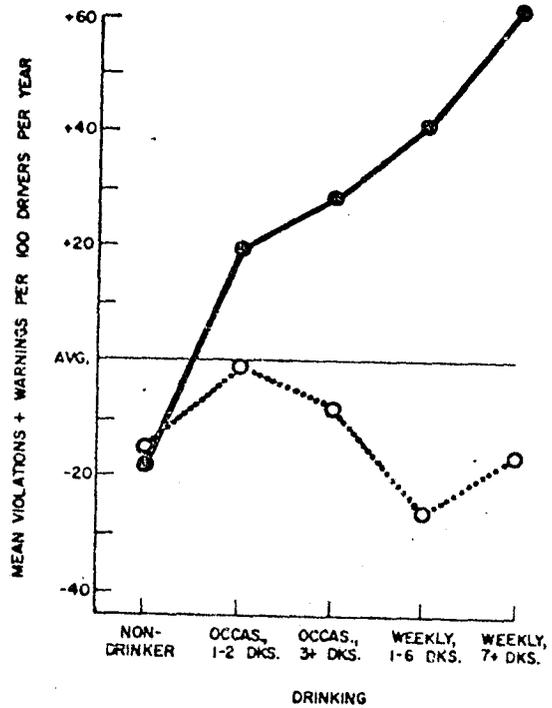
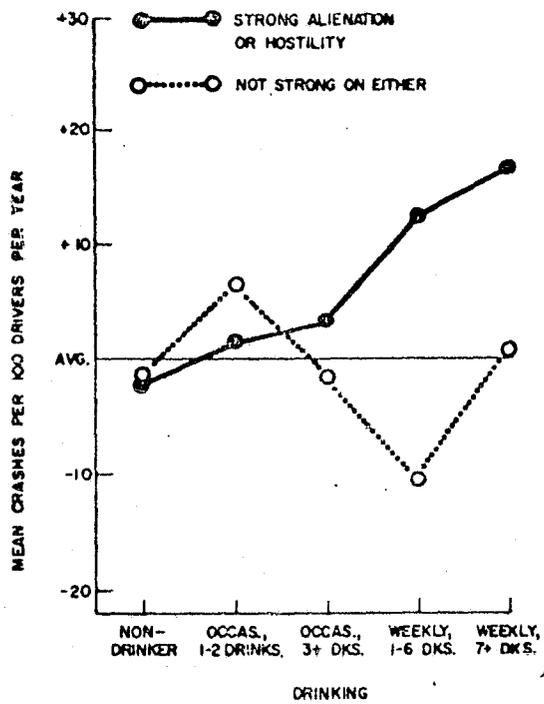
In further analysis, however, the associations between drinking patterns, crashes and violations were found to be limited to only a subgroup (38%) of young men who were either alienated from the school system or who expressed hostility toward others.¹⁰ For this "socially antagonistic" subgroup, as seen in Figure T-18; the rate of crashes increased consistently with increases in frequency and quantity of drinking, although the association still did not attain statistical significance. With respect to violations, the association was statistically significant ($p < .01$) for this subgroup of young men, with weekly heavy drinkers having about 80 more violations per 100 drivers than did non-drinkers (Pelz and Schuman, 1974).

For the remainder of the sample of young men who were neither alienated nor hostile, drinking patterns were not significantly related to either crashes or violations (Pelz and Schuman, 1974). It is interesting to note that the previously mentioned better-than-average driving record of the weekly moderate drinker is evidenced in this analysis only within the non-antagonistic subgroup.

Based on this data the authors concluded that drinking appeared to have an indirect effect on dangerous driving, by releasing aggressive impulses among a minority of young men (Pelz et al., 1975).

FIGURE T-18

CRASH AND VIOLATION RATES BY DRINKING CLASS AND ALIENATION/HOSTILITY FOR YOUNG MEN AGED 16 TO 24



Source: Pelz and Schuman, 1974

A one-year follow-up study (Pelz, 1973), focusing on the relationship between changes in drinking patterns over the intervening year and rates of traffic accidents and violations, found that in general there was only a slight association between changes in drinking and crash and violation rates. The exception to this general finding was evidenced in the group of young men who had been non-drinkers at the time of the first interview but who had begun to drink by the time of the second interview. The crash and violation rates of this group of new drinkers was nearly double that of continuing non-drinkers. This data clearly suggests the important role of the new drinker in traffic accidents and violations.

In further analysis (Pelz, 1973), the relationship between changes in alienation and hostility over the past year and changes in drinking patterns and crash and violation rates was analyzed. Comparison of the group of young men who changed from non-drinkers to drinkers during the course of the intervening year with those who were continuing non-drinkers revealed that the rates of crashes and violations were substantially higher for those who were currently drinkers, whether they were considered antagonistic in both interviews, non-antagonistic in both interviews, or had changed in this respect. For both continuing non-drinkers and those who had begun to drink during the year, violation rates and especially accident rates were, however, highest for the group of young men who were considered antagonistic at both interviews.

It is significant here that while the association between drinking patterns and rates of crashes and violations based on the first year data was limited only to the antagonistic subgroup, the association between changes in drinking (from non-drinker to drinker) and accident and violation rates held for non-antagonistic young men as well as for those who were

antagonistic.

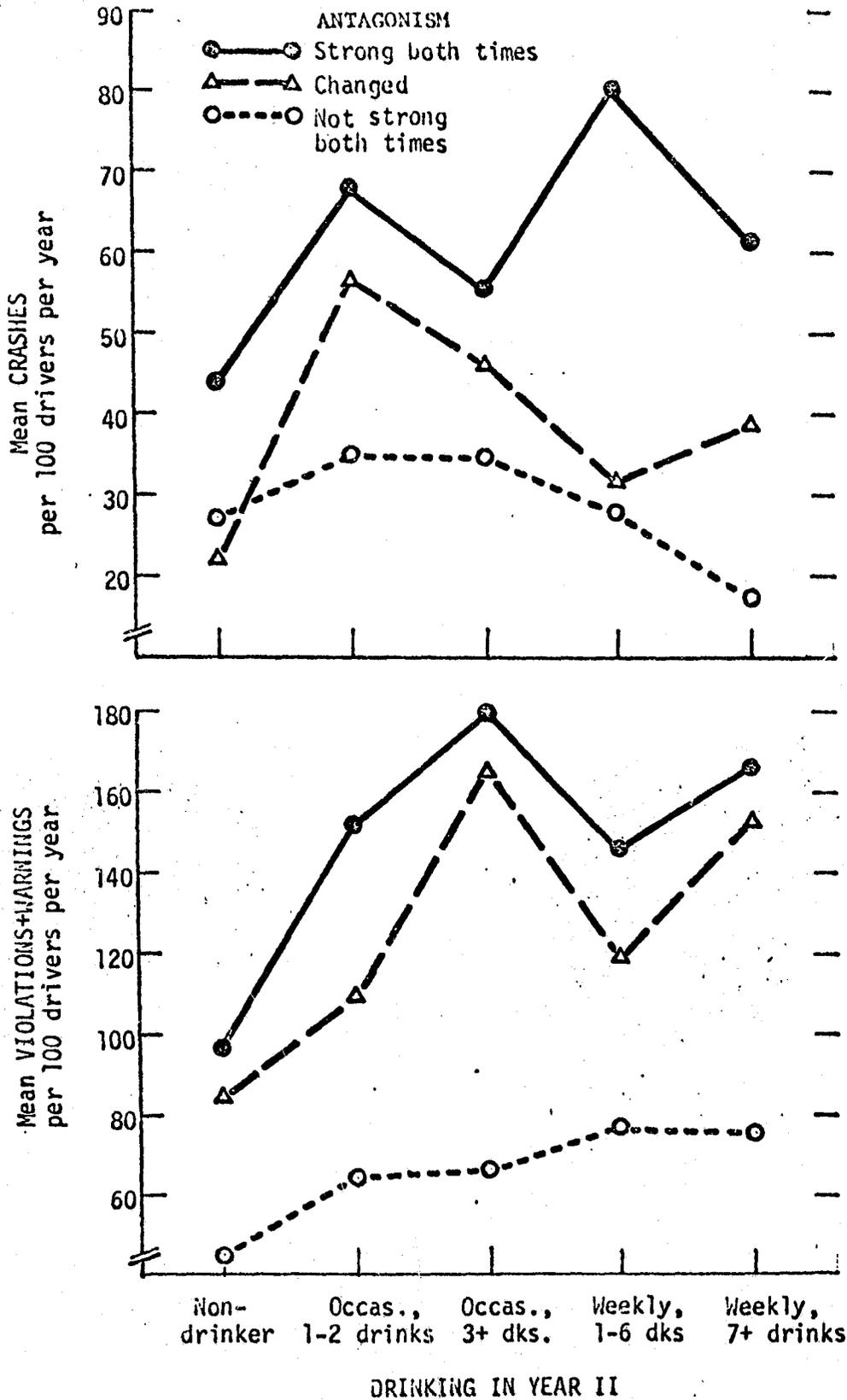
Focusing on current drinking patterns and accident and violation rates as of the second year interview, the inter-relationships between drinking patterns, accidents and violations and changes in antagonism over the preceding year were analyzed. As seen in Figure T-19, non-drinkers had lower rates of crashes and violations than did drinkers in all three groups of drivers.

For the consistently antagonistic subgroup, there were noticeable patterns of increased accidents and violations associated with increased drinking. There were, however, marked differences between these two patterns. In terms of accidents, light drinking was associated with higher accident rates. Occasional drinkers who drank only 1 to 2 drinks per sitting had a higher crash rate than occasional drinkers who drank 3 or more drinks per sitting. Similarly, weekly drinkers who drank 1 to 6 drinks per sitting had a higher crash rate than weekly drinkers who drank 7 or more drinks per sitting. Violation rates, in contrast, were higher for young men who drank heavily (3 or more drinks occasionally and 7 or more drinks weekly) than for lighter drinkers (1 or 2 drinks occasionally and 1 to 6 drinks weekly).

For the subgroup of young men who changed during the preceding year in terms of social antagonism, the relationship between drinking patterns and violation rates was similar to that of the continually antagonistic group. With respect to crashes, however, only the very light drinkers (1 or 2 drinks occasionally) had high crash rates, while those who drank 1 to 6 drinks weekly had a crash rate second lowest only to that of non-drinkers.

Among the consistently non-antagonistic subgroup, drinking patterns had a much smaller effect on crash and violation rates. Trends in the data

FIGURE T-19
 CRASH AND VIOLATION RATES IN YEAR II BY DRINKING CLASS AND
 STABILITY/CHANGE IN ANTAGONISM FOR YOUNG MEN AGED 16 TO 24



Source: Pelz, 1973

do, however, show that crash rates tended to decrease as drinking became more frequent and heavy, while the opposite is true for violation rates, which increased as drinking increased.

Thus, this analysis points out the differential relationship drinking patterns have with crashes as opposed to violations, at least for young men in this study. For all levels of antagonism, light occasional drinking was associated with increased crash rates, while heavy weekly drinking was associated with increased violation rates. Consistent hostility and alienation in combination with these drinking patterns further increased rates of both crashes and violations.

In summary, these surveys of young men have shown that, overall, drinking patterns are not significantly related to accident rates, although they are related to violation rates. Further analysis revealed that these statistical associations and trends were, however, limited to a subgroup of young men who were alienated or hostile. For the remainder of young men who were neither alienated or hostile, drinking patterns made little difference in either crash or violation rates. Data from the one-year follow-up survey indicated that young men who recently began drinking experienced crash and violation rates almost double those of continuing non-drinkers. Second year data also revealed marked differences between the patterns of crash and violation rates associated with drinking behavior. Light infrequent drinking was associated with increased accidents, while heavy frequent drinking was associated with increased violations.

4. Summary

Data presented thus far has revealed a considerable degree of variation concerning the relationship of drinking patterns and traffic accidents and

violations. Findings have been less than consistent for frequency, quantity, and combined measures of quantity and frequency of alcohol use with respect to their association with traffic crashes.

Moreover, the data have lent support to several opposing explanatory theories of the association between drinking patterns and accident-involvement. Certain studies (Perrine et al., 1971; Farris et al., 1975) have provided empirical evidence which links heavy or frequent drinking with accident-involvement. On the other hand additional studies (Borkestein et al., 1964; Pelz and Schuman, 1974) have found that inexperience with drinking, either in terms of light or infrequent drinking or in terms of the newness of the drinking experience, is associated with increased accident-involvement. Still other studies (Boston University School of Law, 1976) have found that while neither standard frequency nor quantity/frequency patterns of drinking are related to overall accident-involvement, a more subjective measure, frequency of intoxication, is significantly associated with increased accident-involvement.

In addition, the effects of moderating factors, such as hostility and alienation, on the relationship between drinking patterns and both crash and violation rates have also been indicated (Pelz, 1973; Pelz and Schuman, 1974; Pelz et al., 1975).

Thus far, however, consideration of the relationship between drinking patterns and traffic crashes and violations has remained on a general level and has not yet focused on alcohol-specific driving behavior. Although the above data on drinking patterns and overall accident and violation experience does not consistently show a statistical association or consistently support any one theory of increased involvement in traffic problems, data on drinking patterns and alcohol-specific driving behavior presented below

appears somewhat more consistent.

B. Alcohol-Related Driving Patterns, Accidents And Violations

One of the most important indicators of the strength of the predictive relationship between drinking patterns and accident-involvement or violation of traffic laws is the association between typical drinking patterns and drinking at the time of the crash or violation. However, before turning to this type of data, brief consideration will be given to another form of alcohol-specific drinking behavior, frequency of driving after drinking.

1. Frequency of Driving After Drinking

Two studies have analyzed the association between accident-involvement, violation of traffic laws, and frequency of driving after drinking. One study (Perrine et al., 1971) has found that relative frequency of driving after drinking was associated with traffic violations but not with accident-involvement. As seen in Table T-18, drivers involved in serious injury accidents evidenced a smaller proportion of persons who reported driving after drinking half the time or more than that seen in the roadblock control group or in either group of drivers cited for traffic violations. Most notably, drivers in both the DWI group and in the non-DWI citation group revealed a significantly larger proportion ($p < .01$) of persons who reported frequent driving after drinking (half the time or more) than did either the control group or the hospitalized crash group. It is interesting to note that although non-DWI citations do not explicitly involve drinking at the time of arrest, this group, as well as the DWI group, reported driving significantly more often after drinking than did other groups.

Similar results were found in a representative household survey of young men, aged 16-24 (Pelz et al., 1975). These young drivers were analytically

TABLE T-18

FREQUENCY OF DRIVING AFTER DRINKING FOR ACCIDENT, CONTROL,
DWI AND NON-DWI CITATION GROUPS IN PERCENT.

Frequency of Driving After Drinking	<u>DRIVER STATUS</u>			
	<u>Hospitalized Crash Group</u>	<u>Roadblock Control Group</u>	<u>DWI Group</u>	<u>Non-DWI Citation Group</u>
Never	35	29	11	6
Less than half the time	54	40	49	45
Half the time or more often	12	31	40	48
TOTAL	101	100	100	99
(N)	(26)	(954)	(47)	(33)

Source: Perrine et al., 1971

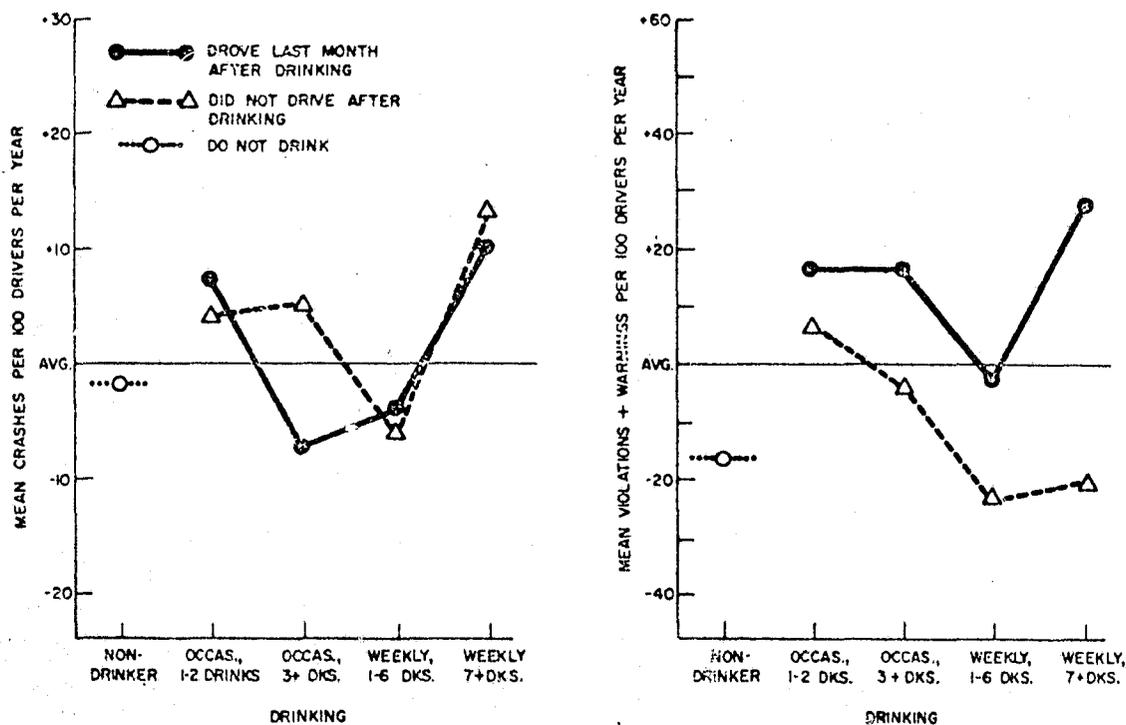
separated into three groups: those who had driven after drinking in the past month, those who had not driven but did drink, and non-drinkers. Analysis of exposure-adjusted¹¹ accident and violation rates of these three groups of drivers revealed that drinking-driving behavior was not significantly related to accidents, although it was significantly associated with violations.

Analysis of the inter-relationship of drinking patterns, drinking-driving behavior and rates of crashes and violations again revealed little

difference in crash rates for any drinking class between those who did and did not drive after drinking. As seen in Figure T-20, the only major difference observed revealed that occasional moderate drinkers who did not drive after drinking actually had a higher rate of crashes than those who did drive after drinking. With respect to violations, the pattern was somewhat different, with young men who drove after drinking having a higher rate of violations in each drinking class than young men who did not drive after drinking.

Additional analysis indicated that when statistical associations between drinking driving behavior and crash and violation rates were

FIGURE T-20: CRASH AND VIOLATION RATES BY DRINKING CLASS AND DRINKING-DRIVING BEHAVIOR FOR YOUNG MEN AGED 16 to 24



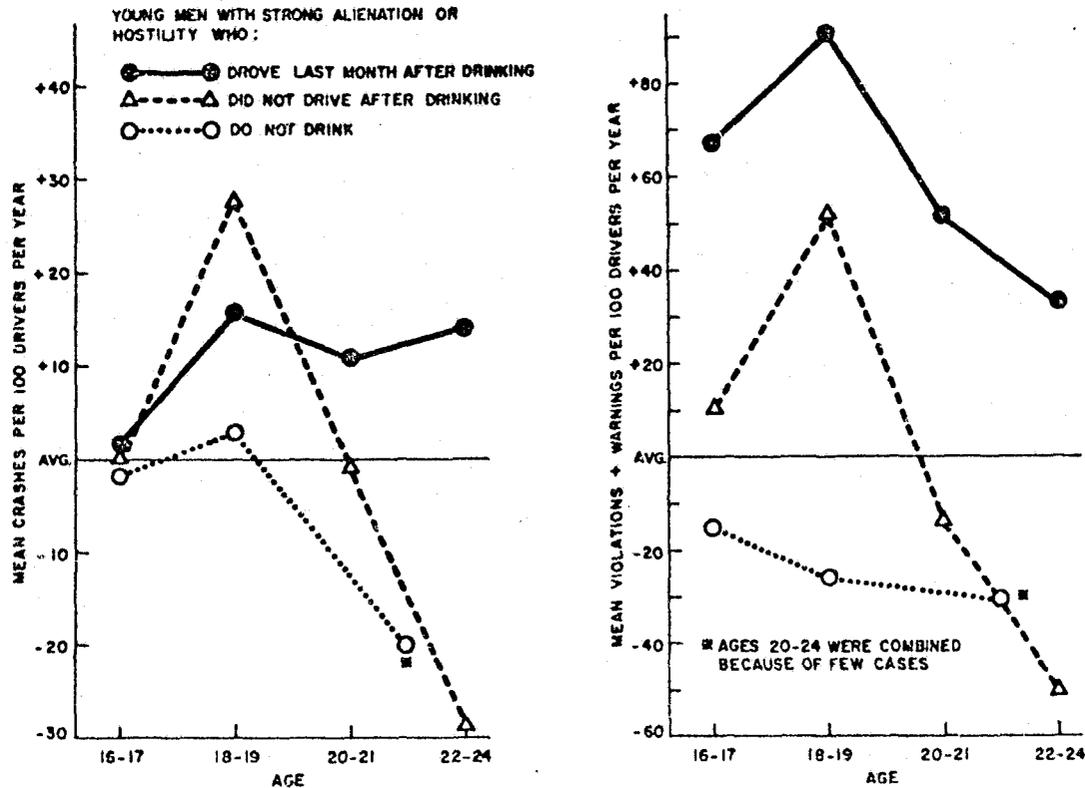
Source: Pelz and Schuman, 1974

analyzed by age, it was found that non-drinkers in each age group from 16 to 24 generally had fewer accidents and violations than did either persons who drove after drinking or those who did drink but did not drive afterwards. However, while those young men who drove after drinking did have more violations in each age group, they did not have more crashes than other drivers who did drink but did not engage in drinking-driving behavior.

Further analysis of the interrelationship of age, drinking-driving behavior and rates of accidents and violations revealed moderating effects of alienation and hostility¹² (Pelz and Schuman, 1974). For the group of young men who were neither alienated nor hostile, whether or not driving after drinking occurred did not affect either crash or violation rates at any age between 16 and 24. As seen in Figure T-21, in comparison, some differences were found in crash and violation rates associated with drinking-driving behavior for young men who did exhibit alienation or hostility.

Among this antagonistic subgroup, non-drinkers generally had the lowest crash and violation rates in each age group. Young men who drank but did not drive after drinking evidenced a substantial increase in both accidents and violations at age 18-19, but the rates dropped sharply after age 20. It is interesting to note that this group, at age 18-19, actually had a higher crash rate, but not violation rate, than young men of similar age who reported driving after drinking. It is also interesting to note that data based on this same survey of young men revealed that while alcohol-related crashes peak at age 22-23, non-alcohol-related crashes peak at age 18-19. The consistency of this finding with the fact that

FIGURE T-21: CRASH AND VIOLATION RATES BY AGE AND DRINKING-DRIVING BEHAVIOR FOR YOUNG MEN AGED 16 to 24 WITH STRONG ALIENATION OR HOSTILITY



Source: Pelz and Schuman, 1974

young men who drink but don't drive after drinking evidence a peak in crashes at age 18-19 is worth noting.

In contrast to the rates of accidents and violations by age groups for those young men who did not drive after drinking, the rates for young men who did drive after drinking revealed elevated crash and violation rates through the age of 24. The crash rate of young men who drove after drinking remained almost as high at age 21-24 as at age 18-19. Although the violation rate dropped after age 18-19, it remained above average through the age of 24.

Based on these findings, the authors suggested that alcohol-related crashes were not initiated by a cross section of young men who mixed alcohol with driving, but rather by a minority of drinking drivers who were angry, rebellious or alienated (Pelz and Schuman, 1974).

Both studies discussed in this section have reported that driving after drinking is statistically associated with traffic violations, although overall it is not related to traffic accidents. The only association found between drinking-driving behavior, and accident-involvement was seen in the rates of accidents for various age groups in a limited group of young men who were either alienated or hostile.

2. The Patterning of Alcohol-Related and Non-Alcohol-Related Accidents and Violations By Drinking Frequency

Turning to the relationship between drinking patterns and actual drinking at the time of the crash, a quick review of the literature reveals that several studies offer data based on a variety of drinking measures. A recent controlled study of drivers judged most responsible for fatal accidents (Boston University School of Law, 1976) has provided data on the association of drinking frequency and drinking at the time of the accident. This data, as seen in Table T - 19, reveals statistically significant differences in drinking frequency between drivers in alcohol-related accidents, in non-alcohol-related accidents and in the control group matched by age, sex and residential area.

A general pattern indicates that with respect to their proportion in the control group, weekly to daily drinkers comprise a larger than expected proportion of drivers in alcohol-related accidents, and a smaller than expected proportion of drivers in non-alcohol-related crashes. On the other hand, infrequent drinkers, those who never or rarely drink and those

TABLE T-19

FREQUENCY OF DRINKING FOR DRIVERS IN ALCOHOL-RELATED ACCIDENTS,
NON-ALCOHOL-RELATED ACCIDENTS AND IN THE CONTROL GROUP (IN PERCENT)

<u>Frequency of Drinking</u>	<u>Accident Group</u>		<u>Control Group</u>
	<u>Alcohol-Related</u>	<u>Non-Alcohol-Related</u>	
Never/rarely	0	16	14
Monthly or less	10	17	15
Monthly to weekly	39	38	33
Weekly to daily	51	29	38
	—	—	—
Total	100	100	100
(N)	(103)	(164)	(801)

Source: Boston University School of Law, 1976

who drink once a month or less, comprise a smaller proportion of drivers in alcohol-related accidents and a slightly greater proportion of drivers in non-alcohol-related accidents than expected in terms of their control group proportions. Monthly to weekly drinkers are somewhat over-involved in both alcohol-related and non-alcohol-related accidents. This data indicates then that frequent drinking is associated with involvement in alcohol-related accidents, while infrequent drinking is associated with non-alcohol-related accidents.

Although this finding is quite consistent with common sense knowledge of the problem, it does not, however, indicate whether frequent drinkers are over-involved in alcohol-related crashes as a result of some alcohol-induced impairment of driving abilities, or merely as a result of circumstance, in that they happened to be drinking at the time, but that the drinking did not cause their accident-involvement.

Information on the association between drinking frequency and alcohol-related and non-alcohol related violations as well as crashes is available from a second study (Perrine et al., 1971). With respect to violations, comparative data on drinking frequency, both in terms of beer and liquor consumption, was analyzed for two groups of traffic violators, DWIs and Non-DWI¹³ offenders. Results indicated that there was no statistically significant difference between DWIs and non-DWI offenders with respect to frequency of beer or liquor consumption. Of those who drank beer, 67% of DWIs and 55% of non-DWI offenders were considered daily beer drinkers. Daily liquor drinkers comprised 24% of those who drank liquor in the DWI group and 4% of those in the non-DWI group.

With respect to accidents, a within-group comparison of fatally injured drivers revealed that fewer drivers who were not drinking at the time of the crash ($BAC < .02\%$) as compared to those who were drinking substantially ($BAC \geq .10\%$) were reported to be daily beer or liquor drinkers. However, an across-group comparison of fatally injured and roadblock control drivers with low alcohol concentrations indicated similar distributions of frequency of beer consumption, and in terms of liquor consumption revealed that fewer fatalities than control group drivers were considered daily drinkers. A similar comparison of fatally injured drivers, roadblock control drivers and DWIs with high alcohol concentrations indicated similar drinking patterns with respect to frequency of liquor consumption and somewhat similar patterns of frequency of beer drinking, although there were fewer daily beer drinkers in the control group than in the fatally injured or DWI groups.

The most detailed data on patterns of drinking frequency and alcohol use at the time of the crash is available from the Borckenstein et al. study (1964). As previously reported, in this study drinking frequency was inversely related to overall accident involvement, with frequent drinkers under-represented in accidents while non-frequent drinkers were over-represented. Additional data on the association of drinking frequency and blood alcohol content at the time of the crash reveals two interesting findings.

First, when the joint distributions of blood alcohol content and drinking frequency were analyzed, the data revealed that within all drinking frequency classes, drivers with lower BAC levels were under-represented in the accident sample while drivers with high BACs were over-represented. In all drinking frequency classes, the group with the greatest over-involvement in accidents was comprised of drivers with the highest BACs.

In a review of this study, Hurst (1973) displays this data graphically. As seen in Figure T-22, within each drinking frequency category, the relative over-representation of drivers in the accident sample and thus the relative probability of accident-involvement increases as blood alcohol content increases. This increase in relative probability is not, however, equivalent for all drinking frequency classes. The increase is more pronounced for infrequent drinkers than it is for frequent drinkers. Moreover, infrequent drinkers show a greater increase in relative probability of accident-involvement at lower BACs than do frequent drinkers. This differential pattern of increased relative probability of accident-involvement as a function of BAC for frequent and infrequent drinkers is reflected in a second analysis.



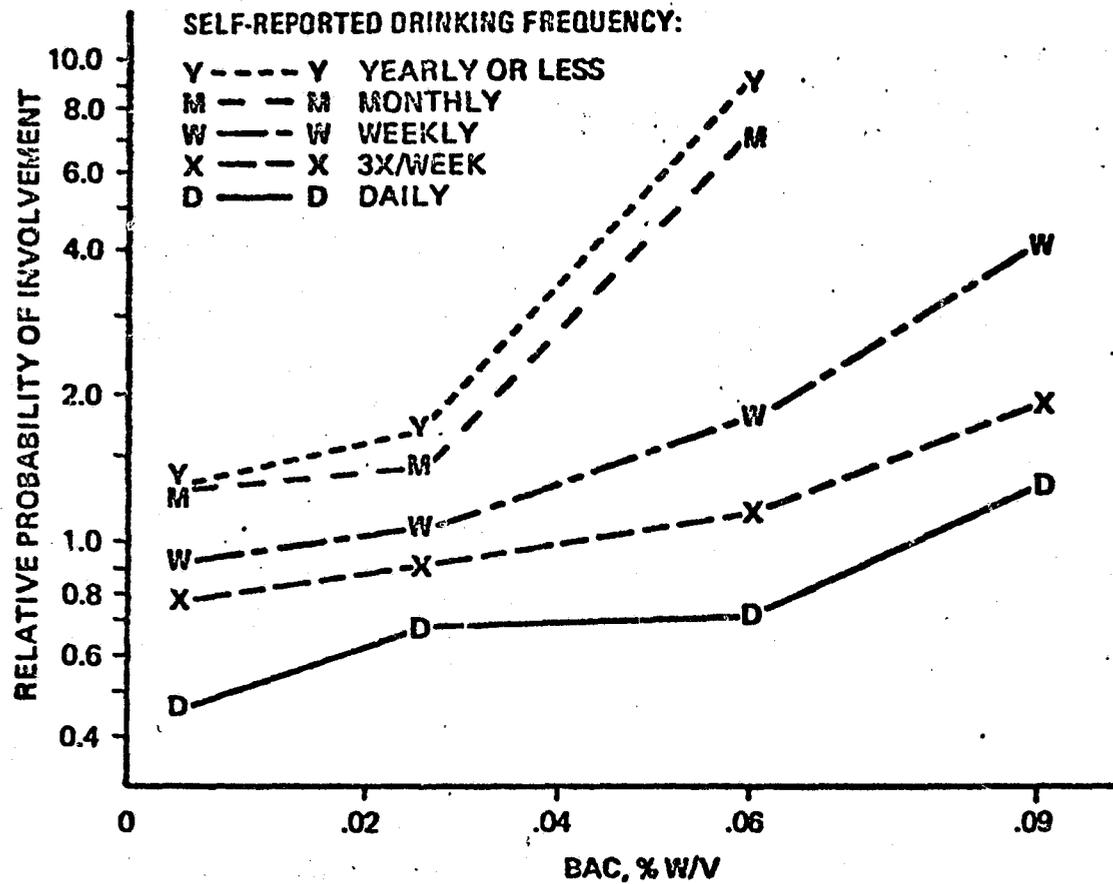


FIGURE T-22 RELATIVE PROBABILITY OF CRASH INVOLVEMENT (BY DRINKING FREQUENCY SUBGROUPS) AS A FUNCTION OF BAC, WHERE 1.0 = RELATIVE PROBABILITY OF COMPOSITE GROUP AT ZERO ALCOHOL.

Source: Hurst, 1973

This second analysis revealed that when the distribution of drinking frequency within categories of blood alcohol content was tabulated, the pattern of over-involvement in accidents for infrequent drinkers and under-involvement in accidents for frequent drinkers was consistently observed in all categories of blood alcohol content. As seen in Table T-20, the least frequent drinking classes in each category of blood alcohol content are over-represented in accidents in terms of their proportions in the control group. The reverse is true for frequent drinkers, who are involved in less than the expected number of accidents, both those that did not involve drinking at the time (BAC of .00%) and those that involved any degree of drinking (BACs of .01 - .04%, .05 - .07%, .08 - .10% and .11% or higher).

When tested for statistical significance, this association between drinking frequency and accident-involvement remained significant at all levels of blood alcohol content. Thus, drinking frequency was more strongly related to accident-involvement than other variables such as age, education, marital status and annual mileage, all of which failed to remain significantly associated with accident-involvement at higher levels of blood alcohol content. With respect to these latter variables, there was little or no difference in accident-involvement at high alcohol levels between drivers in various classes and categories of these variables. In contrast, the association between drinking frequency and accident-involvement remained significant even at alcohol levels of .11% or higher.

In contrast to the previous two studies, data from this study has thus shown that for both alcohol-related and non-alcohol-related crashes, infrequent drinkers were involved in more accidents than would be expected based

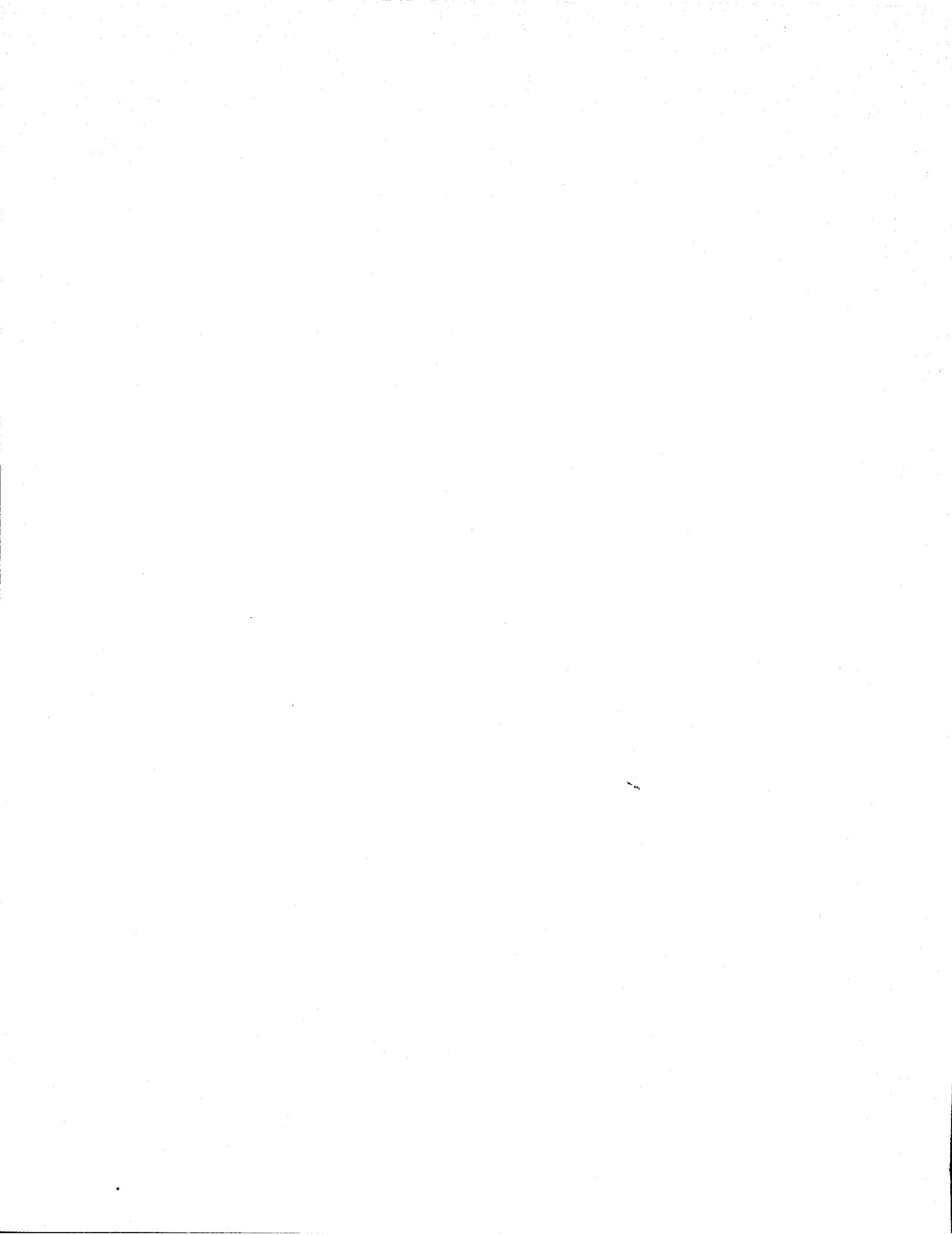


TABLE T-20

DISTRIBUTION OF DRINKING FREQUENCY WITHIN BLOOD ALCOHOL CATEGORIES FOR ACCIDENT AND CONTROL GROUPS (IN PERCENT)

Frequency	B l o o d A l c o h o l C o n t e n t														
	.00			.01 - .04			.05 - .07			.08 - .10			.11 +		
	Acc.	Cont.	Status ^a	Acc.	Cont.	Status ^a	Acc.	Cont.	Status ^a	Acc.	Cont.	Status ^a	Acc.	Cont.	Status ^a
Yearly or less	51	44	+	24	16	+	18	4	+	--	--	--	--	--	--
Monthly	19	16	+	14	10	+	27	8	+	--	--	--	--	--	--
Weekly	20	22	-	31	29	+	27	30	-	50	28	+	45	29	+
Three times per week	7	10	-	16	19	-	16	25	-	24	28	-	24	32	-
Daily	3	8	-	16	25	-	12	33	-	26	44	-	31	39	-
TOTAL	100	100		99	101		100	100		100	100		100	100	
(N)	(4878)	(6283)		(398)	(543)		(184)	(129)		(103)	(61)		(216)	(40)	

221

a. The status column denotes the status of the Accident Group relative to the Control Group with respect to the proportion of persons in each drinking frequency class: a "+" sign indicates that the Accident Group is over-represented, and a "-" sign indicates that the Accident Group is under-represented.

Source: Borkenstein et al., 1964

on their representation in the control group. Although relative probability of accident-involvement increases as BAC increases within all drinking frequency classes, infrequent drinkers are still over-involved in accidents at all levels of blood alcohol content.

3. The Patterning of Alcohol-Related and Non-Alcohol-Related Accidents and Violations By Quantity Measures of Drinking Behavior

Data on the association of typical patterns of quantity of drinking and alcohol related and non-alcohol related crashes and violations is available from a study (Perrine et al., 1971). With respect to violations, the data revealed that of traffic violators who drank beer, a significantly higher proportion ($p < .01$) of those in the DWI group (50%) than of those in the non-DWI group (27%) were considered heavy beer drinkers (5 or more bottles per sitting). Similarly, of those who drank liquor, a significantly higher proportion ($p < .01$) of DWIs (80%) than of other non-DWI traffic offenders (50%) drank 3 or more shots of liquor at a sitting.

With respect to accidents, a within-group comparison of fatally injured drivers revealed that 100% of drivers with very low alcohol concentrations (BAC $< .02\%$) were light drinkers in terms of both beer and liquor consumption, while only 40% of control group drivers were light drinkers in terms of beer consumption, and only 36% in terms of liquor consumption. However, a comparison of fatally injured drivers and control group drivers with similar alcohol concentrations revealed no significant evidence of heavier drinking on the part of accident-involved drivers.

This data has indicated that typical drinking patterns in terms of the quantity of alcoholic beverages consumed are related to whether or not a violation or an accident is alcohol-related. However, when accident-involved

drivers were compared with control group drivers, the data revealed that there was no significant association between these drinking patterns and increased risk of accident-involvement.

4. The Patterning of Alcohol-Related and Non-Alcohol-Related Accidents and Violations By Quantity/Frequency Measures of Drinking Behavior

Turning to the relationship between combined measures of drinking behavior and alcohol-specific traffic accidents and violations, data from two studies (Perrine et al., 1971; Boston University School of Law, 1976) reveals several significant associations. In a Boston study of drivers judged most responsible for fatal crashes (Boston University School of Law, 1976), both general drinking patterns and frequency of intoxication were significantly related to whether or not accident-involved drivers had been drinking at the time of the crash.

As seen in Table T-21, a significantly larger proportion ($p < .01$) of drivers in alcohol-related crashes (55%) than of drivers in non-alcohol-related crashes (17%) or those in the control group (23%) were heavy social drinkers, sporadic binge drinkers or alcohol abusers. Similarly, Table T-22 indicates that persons who report that they become intoxicated more often than once a month comprise a significantly larger proportion ($p < .01$) of drivers in alcohol-related accidents (40%) than of drivers in non-alcohol-related crashes (12%) or of those in the control group (9%). Thus, in this study typical patterns of frequent heavy drinking, as well as frequent intoxication, were associated with increased involvement in alcohol-related fatal accidents.

A second study of fatal traffic crashes (Perrine et al, 1971) found that fatally injured drivers with low alcohol concentrations ($BAC < .02$) were reported to have medium or heavy quantity/frequency patterns of drinking

TABLE T-21

DRINKING PATTERNS OF DRIVERS IN ALCOHOL-RELATED
ACCIDENTS, NON-ALCOHOL RELATED ACCIDENTS AND IN
THE CONTROL GROUP (IN PERCENT)

Drinking Pattern	Accident Group		
	Alcohol-Related ^a	Non-Alcohol-Related	Control Group
Abstainer	0	13	13
Light Social	26	48	24
Moderate Social	19	22	40
Heavy Social	31	14	18
Sporadic Binge	11	1	1
Alcohol Abuser	13	2	4
Total	100	100	100
(N)	(103)	(164)	(801)

a. BAC \geq .05%, if available, or a clinical evaluation of the same

Source: Boston University School of Law, 1976

TABLE T-22

FREQUENCY OF ALCOHOL INTOXICATION FOR DRIVERS IN
ALCOHOL-RELATED ACCIDENTS, NON-ALCOHOL-RELATED
ACCIDENTS AND IN THE CONTROL GROUP (IN PERCENT)

Annual Frequency of Alcohol Intoxica- tion	Accident Group		
	Alcohol-Related ^a	Non-Alcohol-Related	Control Group
Never	0	33	35
1-2 times	23	23	28
3-8 times	24	22	14
\geq Monthly	13	10	14
$<$ Weekly	27	10	7
\geq Weekly	13	2	2
Total	100	100	100
(N)	(103)	(164)	(801)

a. BAC \geq .05%, if available, or a clinical evaluation of the same.

Source: Boston University School of Law, 1976

much less often than fatally injured drivers with high alcohol concentrations at the time of the accident ($BAC \geq .10$). A comparison of fatally injured and control group drivers with similar alcohol concentrations revealed that in the low alcohol concentration group, fatally injured drivers were less likely than control group drivers to be medium or heavy drinkers. In contrast, in the high alcohol concentration group, fatally injured drivers were more often medium and heavy drinkers than were drivers in the control group. However, the proportions of fatally injured drivers (33%) and control group drivers (27%) with high alcohol concentrations who were considered heavy drinkers were somewhat similar.

5. Summary

Data from the few available studies has consistently indicated that frequent driving after drinking is significantly related to increased traffic violations, although it is not associated with involvement in accidents.

Typical drinking patterns, both quantity, frequency and combined measures of drinking behavior, were associated with whether or not violations and accidents were alcohol-related. However, studies have shown mixed results with respect to the relative accident-involvement of different types of drinkers when compared to their representation in the general driving population. For example, in terms of drinking frequency, both infrequent drinkers and frequent drinkers were statistically linked to over-involvement in alcohol-related accidents. However, research on the association of quantity or quantity/frequency measures of drinking behavior and accident-involvement has shown somewhat more consistent indications that heavy drinking and frequent intoxication are related to over-involvement in alcohol-related traffic accidents. Because of the small number of studies focused on the association between drinking patterns, accident-involvement and traffic violations, this area remains a topic for future research.

IV: THE ROLE OF THE PROBLEM DRINKER OR ALCOHOLIC IN TRAFFIC EVENTS

A. Empirical and Theoretical Focus of Research in This Area

By the mid-1950s, researchers began to debate the issue of the relative roles of the casual drinker and the alcoholic in traffic accidents. As early as 1956 some were suggesting that the widely-held view of the drinking driver as predominantly a casual or social drinker was incorrect (Popham, 1956). Evidence for the argument that the alcoholic or problem drinker was a major contributor to traffic crashes was first seen in the excessively high BACs of fatally injured drivers and persons convicted for drunken driving (Popham, 1956; Schmidt and Smart, 1959; California Highway Patrol, 1965; Waller, 1967; Waller et al., 1969b). It was assumed that social drinkers would rarely, if ever, reach such extremely high levels of blood alcohol content.

A second source of evidence was the apparent lack of effectiveness of various campaign strategies aimed at reducing drunken driving through informing and educating the public about the dangerousness of alcohol. It was repeatedly claimed by various researchers that the lack of effectiveness of these campaigns could be due at least in part to the large involvement of alcoholics in the drinking-driving problem (Popham, 1956; Schmidt and Smart, 1959; Schmidt et al., 1962). According to these researchers, all such rationally-based appeals have little effect on the alcoholic, in that the basis for his drunken driving was a pathology rather than social misjudgment (Popham, 1956; Schmidt and Smart, 1959; Schmidt et al., 1962).

A number of researchers over the last twenty years have sought to determine the proportion of traffic accidents and violations that involve problem drinkers and alcoholics. Research in this area, however, is comprised of a much smaller

number of studies than is research on the incidence of alcohol in traffic accidents. Moreover, whereas measurement of alcohol use at the time of the crash is for the most part well specified and consistent across studies, operational definitions of alcoholism and problem drinking are often vague and vary considerably across studies.

The majority of studies focused on the role of the problem drinker or alcoholic in traffic accidents and violations rely on three general kinds of samples: (1) persons involved in alcohol-related accidents, (2) persons convicted of impaired or drunken driving, and (3) traffic fatalities. Alcohol involvement is inherent in the first two types of samples (persons involved in alcohol-related accidents and persons convicted of drunken driving) and has been found in numerous studies to be high in the third type of sample (traffic fatalities), as we have seen in Section Two of this report. Thus, estimates of the involvement of alcoholics and problem drinkers in accidents and violations based on these studies often cannot be generalized to the entire range of traffic events, certainly not to less severe and/or alcohol-free accidents.

In addition, there is a noticeable lack of control groups in the great majority of these studies. As a result of these factors, knowledge of the actual role of problem drinkers and alcoholics in the overall traffic problem is somewhat limited.

B. Empirical Research

It is a much publicized fact that a large proportion of accident-involved drivers and persons convicted of impaired or drunken driving have histories

of alcohol-related problems and can thus be labelled problem drinkers or alcoholics (Selzer et al., 1963; Selzer et al., 1966; Selzer et al., 1967; Waller, 1967; Selzer, 1969b; Waller and Turkel, 1969). Several researchers have found that problem drinkers and alcoholics are involved in the majority of alcohol-related traffic accidents and deaths. However, as data presented in this section will show,* the range across studies in the proportion of accidents and DWI offenses that involve this group of labelled alcoholics and problem drinkers is rather large. Thus, the following discussion will examine certain factors that bear on the reported involvement of this group of labelled alcoholics and problem drinkers in traffic crashes and violations. As a basis for this discussion, data from a number of studies has been presented in Tables T-23 and T-24.

1. Types of Traffic Events

In general, variation across studies in the proportion of traffic accidents and violations which involve problem drinkers and alcoholics is not explained or reduced to any large extent by the type of traffic event under consideration. For example, a review of data in Tables T-23 and T-24 reveals that the range of estimates of the proportion of alcohol-related accidents which involve problem drinkers varies from 3-50%. Alcoholics and problem drinkers comprise 23-64% of traffic fatalities and 3-100% of DWI offenders. Although overall this data does not reveal any significant patterning in the involvement of problem drinkers and alcoholics by type of traffic event, a few trends can be observed in studies which offer comparative data on the proportion of identifiable problem drinkers and alcoholics in different types of traffic accidents and violations.

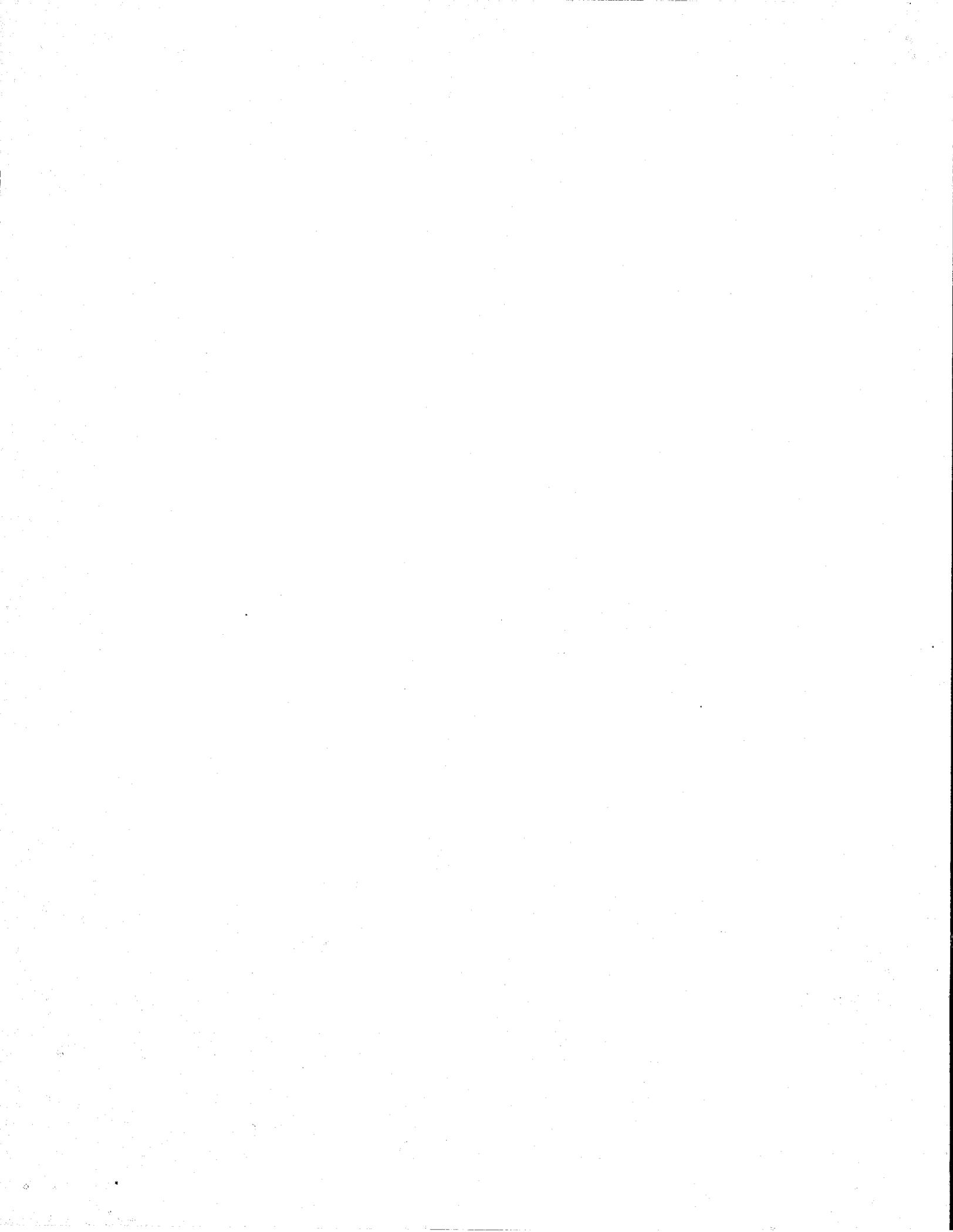
*See also Chart II in Chapter One of this report.

Table T-23 Empirical Studies -- Traffic
Persons Involved in Accidents -- Percent Alcoholic or Problem Drinker

Author, date, location	Sample	% Alcoholic or Problem Drinker	Alcohol Indicators
<u>Canadian</u>			
Popham, 1956, Toronto, Canada	427 drivers in alcohol-related accidents	3% Alcoholics	History of treatment for alcoholism
Schmidt et al., 1962, Toronto, Canada	427 drivers in alcohol-related accidents	6% Alcoholics	History of treatment for alcoholism after 4 year follow-up
Smart and Schmidt, 1967, Toronto, Canada	334 drivers in all accidents; of which	4% Alcoholics 8% Problem Drinkers 12% Total	History of treatment for alcoholism One or more alcohol-related arrest
	96 drivers involved in alcohol-related accidents	7% Alcoholics 16% Problem Drinkers 23% Total	History of treatment for alcoholism One or more alcohol-related arrests
	238 drivers involved in non-alcohol-related accidents	3% Alcoholics 5% Problem Drinkers 8% Total	History of treatment for alcoholism One or more alcohol-related arrest
<u>United States</u>			
Waller and Turkel, 1966, San Francisco, CA	208 traffic fatalities:		
	94 fatalities 25 years of age or older who died within 6 hours of the accident	27% Alcoholics	Cirrhosis
Waller, 1967, Oakland, Calif.	37-48 fatalities less than 25 years of age	0% Alcoholics	Cirrhosis (No overall rate of cirrhosis available)
	33 drivers in alcohol-related accidents	50% Problem Drinkers	Two or more alcohol-related arrests or identification by community agency as a problem drinker
Selzer, 1969a, Michigan	117 drivers in non-alcohol-related accidents	14% Problem Drinkers	
	96 dead and surviving drivers judged responsible for fatal accidents	37% Alcoholics 11% Frequent High Quantity Users	History of alcohol-related interpersonal, social and financial problems based on testimony from family, friends, employers, physicians and others Eight or more ounces of 80 proof liquor within 4 hr period at least monthly
Waller et al., 1969, Calif.	2069 traffic fatalities	X Alcoholics	165 persons were found to have cirrhosis of the liver but published data is unclear as to whether this figure refers to the total sample or a partial sample
Baker and Spitz, 1970 Baltimore, Md.	120 driver fatalities	7% Alcoholics	Early cirrhosis or severe fatty liver
Filkins et al., 1970, Wayne Co., Michigan	616 traffic fatalities	23% Problem Drinkers	Any one of the following: BAL of .25% or higher, conviction for DWI, non-traffic drunkenness offense, cirrhosis, agency record of alcoholism/problem drinking, testimony of morgue witness
Turk et al., 1974, N. Carolina	39 drivers fatally injured in single-vehicle crashes	58% Alcoholics (36%)	Cirrhosis of the liver (Number in parentheses is proportion of entire sample rather than only the partial sample who were given liver exams)
	28 drivers fatally injured in multi-vehicle crashes	50% Alcoholics (36%)	
	33 pedestrian fatalities	64% Alcoholics (48%)	
Boston University School of Law, 1976, Boston, Mass.	267 dead and surviving drivers judged responsible for fatal accidents	40% Problem Drinkers	Scale based on quantity-frequency measures, physiological factors, BAC, hospitalization for alcohol-related problems, alcohol-related arrests

Table T-24 Empirical Studies -- Traffic
DWI Offenders -- Percent Alcoholic or Problem Drinker

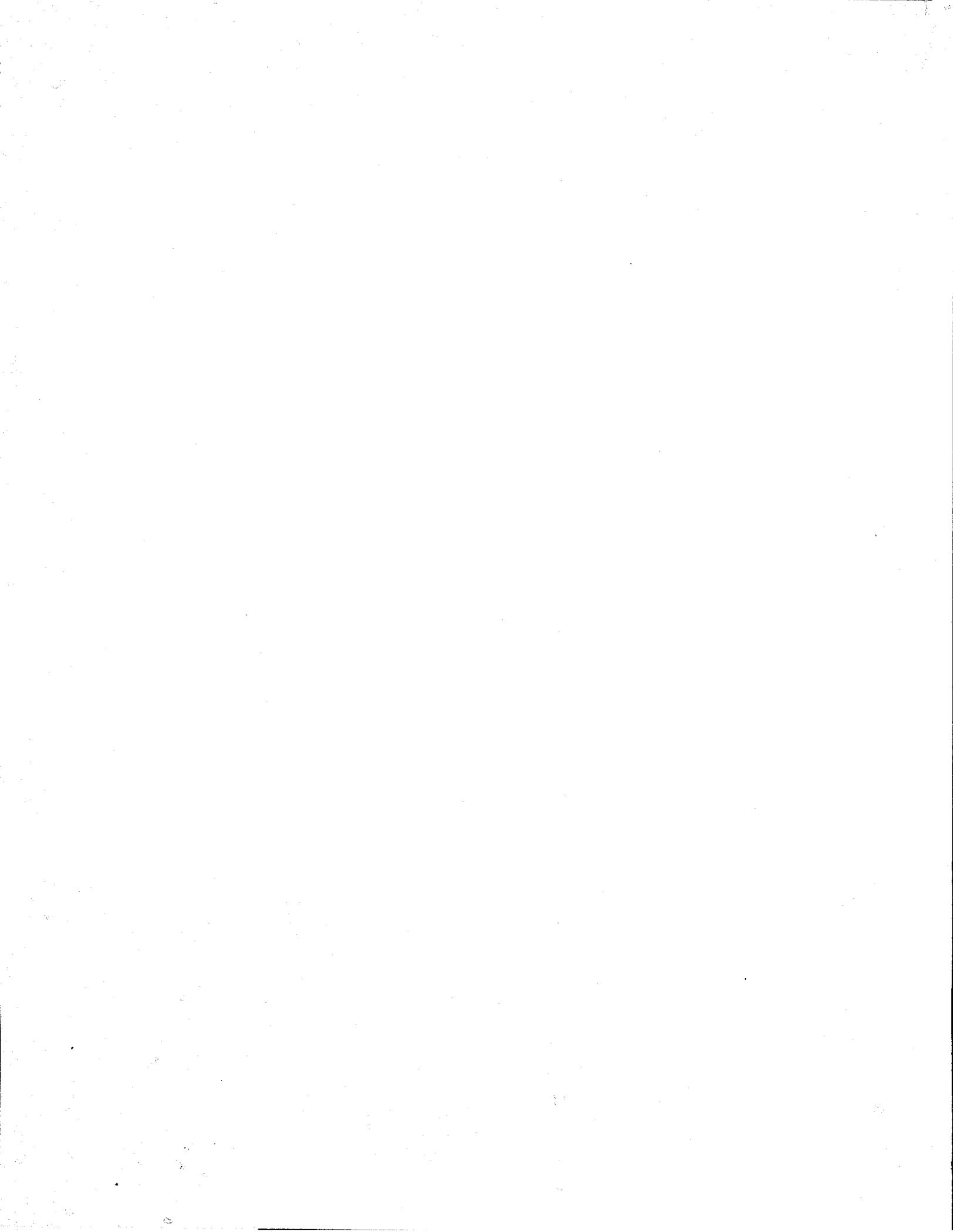
Author, date, location	Sample	% Alcoholic or Problem Drinker	Alcohol Indicators
<u>United States</u>			
Selzer et al., 1963, Ann Arbor, Michigan	67 drivers apprehended for driving while intoxicated	57% Alcoholics 15% Probable Alcoholics 6% Pre-alcoholics or Problem Drinkers <hr/> 78% Total Persons with Drinking Problems	History of alcohol-related interpersonal, social and financial problems based on testimony of driver and spouse or other close relative
Waller, 1967, Oakland, Calif.	150 males convicted of drunken driving or being drunk in or about a vehicle	63% Problem Drinkers	Two or more alcohol-related arrests or known to community agencies as problem drinker
Kaestner et al., 1969, Oregon	789 drivers convicted of driving while under the influence of liquor	3% Alcoholics	History of treatment for alcoholism
Kelleher, 1971, Cook Co., Ill.	250 drivers convicted of drunken driving	20% Alcoholics	Self-report (8%) or psychiatric diagnosis of alcoholism (12%)
Rosenberg et al., 1972, Md.	2000 white males -- annual average based on Maryland statistics -- whose licences were revoked for drunken driving	7% Alcoholics	Psychiatric diagnosis of alcoholism at some time from 4 years prior to 7 years after DWI conviction
Yoder and Moore, 1973, El Cajon, Calif.	269 drivers originally charged with driving while under the influence of alcohol:		
	201 First offenders:	69% Alcoholics	
	166 men	71% Alcoholics	
	35 women	63% Alcoholics	
	68 Repeat offenders:	87% Alcoholics	
	63 men	86% Alcoholics	
	5 women	100% Alcoholics	
Fine et al., 1975, Philadelphia, Pa.	1500 drivers arrested for first drunken driving offense	54% Problem Drinkers	Quantity-frequency index and number and degree of physical and behavioral symptoms of excessive alcohol use
Selzer and Vinokur, 1975, Michigan	306 men arrested for drunken driving	39% Alcoholics 19% Borderline Alcoholics	Score of 6 + on brief MAST Score of 5 on brief MAST
Argeriou and Paulino, 1976, Boston, Mass.	73 women arrested for driving while intoxicated	41% Problem Drinkers 28% Emerging Problem Drinkers	High BAC at time of arrest (usually above .20%) and drinking practices resulting in alcohol-related problems based on probation record and home investigation, MAST and self-report BAC at time of arrest above .15% and drinking practices which have begun to result in alcohol-related problems



Two studies in particular (Smart and Schmidt, 1967; Waller, 1967) found that alcoholism or problem drinking was much more commonly discovered in samples of alcohol-related accidents than in samples in which alcohol was not involved. Waller (1967) found that among drinking drivers involved in a crash 50% could be labelled as problem drinkers while among nondrinking drivers the proportion of alcoholics was reduced to 14%. Smart and Schmidt (1967) found that while about 12% of all accident-involved drivers could be identified as alcoholics or problem drinkers, among drivers who were drinking before the crash, 23%, and among nondrinking drivers only 8% could be identified as such. Thus, in both studies drinking drivers in crash samples were roughly 3 times as likely as nondrinking drivers to be identifiable as problem drinkers or alcoholics.

With respect to the role labelled alcoholics and problem drinkers play in traffic violations for drunken or impaired driving, one study (Yoder and Moore, 1973) presented in Table T-24 indicates that the proportion of identifiable alcoholics varies according to the sex of the DWI offender and by whether he or she was a first or repeat offender. Data from this study revealed that 69% of 201 first offenders, as compared to 87% of 68 repeat offenders, were labelled as alcoholics on the basis of the Michigan Alcoholism Screening Test (MAST).

Despite these limited trends in a few of the studies focused on the role of problem drinkers and alcoholics in traffic accidents and violations, much of the variation across studies in the proportion of traffic events which involve this group of labelled alcoholics and problem drinkers remains unaccounted for.



CONTINUED

3 OF 9

2. Indicators of Problem Drinking and Alcoholism

An increasing number of researchers are pointing to the considerable variety of criteria used to define the problem drinker or alcoholic, and to the resulting marked differences in the estimates of the extent to which this group is involved in traffic accidents and violations (Bacon, 1968; Fine and Scoles, 1974; Selzer, 1975).

Although researchers in this field have employed a wide variety of operational definitions of problem drinking and alcoholism, certain specific types of indicators appear frequently in many of these studies. For example, several studies of accident-involved drivers and persons convicted of drunken or impaired driving have relied on a history of admission to a clinic or hospital for treatment of alcoholism as one of several indicators or as the sole criterion on which estimates of the involvement of alcoholics in traffic accidents and violations are based (Popham, 1956; Schmidt et al., 1962; Smart and Schmidt, 1967; Kaestner et al., 1969; Filkins et al., 1970; Rosenberg et al., 1972; Boston University School of Law, 1976).

Various other studies have considered a history of alcohol-related interpersonal, social, and economic problems as an indicator of problem drinking (Selzer et al., 1963; Schmidt and Smart, 1967; Waller, 1967; Selzer, 1969b; Filkins et al., 1970; Boston University School of Law, 1976; Argeriou and Paulino, 1976). However, as will be seen from data presented in this section, different indicators do not yield similar rates of problem drinking, and moreover, they do not even identify the same individuals from the population.

As seen in Tables T-23 and T-24, several studies have found that only small proportions (3-7%) of persons convicted of DWI and persons involved in accidents are identifiable as alcoholics on the basis of past or future treatment for alcoholism at a hospital or clinic (Popham, 1956; Schmidt et al., 1962; Smart and Schmidt, 1967; Kaestner et al., 1969; Rosenberg et al., 1972).

However, in studies which have relied on multiple criteria for identifying alcoholics or problem drinkers it can be seen that the proportion of identifiable treated alcoholics is substantially increased when additional indicators of problem drinking are employed. For example, in a Michigan study of 96 deceased and surviving drivers judged by police to be responsible for fatal accidents (Selzer, 1969a), only 3% of these drivers had been admitted for treatment for alcoholism in a clinic or hospital. Yet, when persons who received assistance with their drinking problems from family doctors, clergymen, and limited visits with psychiatrists are

added to the group of persons who received institutional treatment for alcoholism, a total of 11% of the 96 drivers were identifiable as alcoholics.

When an additional group of persons who were identified as having alcohol-related interpersonal, social, and economic problems on the basis of testimony from family members, friends, and employers are added to the number of previously identifiable alcoholics, 37% of the sample of drivers can be labelled as alcoholics. Lastly, if an additional 11% of these drivers who do not fit the definition of an alcoholic but who drink the equivalent of 8 or more ounces of 80 proof whiskey within a four-hour period at least once monthly and who are referred to as "frequent, high quantity users" are combined with the identifiable alcoholics, a total of 48% of the 96 drivers can be identified as persons with serious drinking problems.

As seen from the preceding example, estimates of the involvement of alcoholics and problem drinkers in traffic accidents and violations are influenced heavily by the number and type of definitional criteria used to identify persons with serious drinking problems in samples of accident-involved drivers.

There is little published information on the specific number of indicators of problem drinking considered sufficient as criteria for researchers to identify persons as alcoholics and problem drinkers. One study has, however, presented this type of data (Filkins et al., 1970). This study analyzed the driving, criminal, and coroner's records of 616 fatalities as well as their records from various social and medical agencies where available. Persons were identified as problem drinkers if evidence of any one of the following indicators was discovered: (1) a BAL of .25% or higher, (2) a conviction for driving under the influence of liquor (DUIL), (3) a

conviction for a drunkenness offense not related to driving, (4) cirrhosis of the liver, (5) diagnosis of alcoholism or excessive drinking on a social or medical agency record, or (6) a report of alcoholism by the witness who identified the fatality at the morgue. A total of 143 persons or 23% of the 616 fatalities were identified as problem drinkers on the basis of one or more of these criteria.

With respect to the number of problem drinker indicators used to identify these persons, Filkins et al. point out that drunkenness offenses not related to driving were usually found in conjunction with other indicators of problem drinking. Of the 17 persons with this type of conviction, 82% had at least one other indicator. However, for the remaining 126 persons, the majority had only one indicator of problem drinking. Of the 87 persons with a BAL of .25% or higher, 82% had no other indicators. Of the 18 persons with a DUIL conviction, 78% had no other indicator. Of the 11 individuals reported to be alcoholics by the morgue witness 55% had no other indicator. Of the 14 persons with cirrhosis, 64% had no other indicator. Overall, 127 of the 143 fatalities identified as problem drinkers, or 89%, had only one indicator of problem drinking.

Although these findings are based only on one study and thus cannot be generalized to other traffic studies, they do provide an interesting and significant source of information for comparison with similar data based on general population drinking practices and problems. In a national general population sample of men aged 21-59, 50% of American men had at least one alcohol-related problem of minimal severity in the preceding three years and 72% of American men had had such a problem sometime in their lifetime (Cahalan and Room, 1974). This same study reported that 36% of American

men had at least one alcohol-related problem of high severity in the preceding three years and 55% had had a problem of this nature in the course of their lifetime.

The implications of this data for studies of accident-involved persons and DWI offenders which rely solely on one indicator, such as a BAC of .25% or higher (criterion suggested by the National Highway Traffic Safety Administration) or one or more alcohol-related arrests, to identify problem drinkers is clear. Where multiple criteria are employed, and the person can qualify as an alcoholic/problem drinker by satisfying any one of them, researchers may fail to realize that many people in the general population would qualify as alcoholics or problem drinkers if the same criteria were applied to them. In fact, if such large proportions of men in the general population have had one or more alcohol-related problems (although Cahalan and Room do not refer to these persons as problem drinkers unless they have an overall problem score of 7+ which takes into account both the number and severity of the problems), "problem drinkers" would be involved in a lesser proportion of traffic fatalities in the Filkins et al. study than expected based on their proportion in the general population.

This general population data also points out an additional factor which may contribute to the variation in the proportion of accident-involved persons who are identified as alcoholics or problem drinkers. As seen in this data, the proportion of men with at least one alcohol-related problem of minimal severity increased from 50%, when only the preceding three years were taken into account, to 72% when lifetime problems were considered. This pattern of increasing numbers of persons identifiable as problem drinkers as the length of time covered in the search for alcohol-related problems, arrests, and admissions to clinics and hospitals increases is also seen in traffic specific data.

As can be seen from data in an Oregon study of males convicted of drunken or impaired driving, the number of persons with alcohol-related arrests, a

common indicator of problem drinking in traffic studies, is greatly dependent on the number of years for which driving records were searched (Kaestner et al., 1969). In this study, 3.6% of the DWI offenders had a similar conviction one year prior to the study, 7.8% had one 2-4 years prior, 6.4% had one 5-9 years prior, 3.5% had one 10-14 years prior, 2.1% had one 15-19 years prior, and 0.8% had one 20 or more years prior to the study. The implications of this data are clear. As information from official records of all types is often the source for alcohol-related problems and arrests used to identify alcoholics and problem drinkers, it is clear that differences across studies in the number of years for which these records are searched could easily contribute to variation in the proportion of persons identified as alcoholics or problem drinkers in these studies.

As this type of information on the period of time for which various records were checked for incidence of alcohol-related problems is rarely given, an analysis of the effect of variation in this factor on the proportion of persons identified as alcoholics or problem drinkers cannot be undertaken. Nor can specific general population data on the incidence of persons with the same alcohol-related problems be accurately applied as a comparative check on the relative involvement of problem drinkers in traffic crashes and violations.

In summary, data from various sources have clearly demonstrated that the number of identifiable alcoholics or problem drinkers in any sample of persons, whether persons in the general population or those involved in traffic accidents, is extremely dependent on the number, severity, and recency of indicators of problem drinking used in each study. Because of the importance of this factor in determining the role of problem drinkers and alcoholics

in traffic accidents, comparative data from controlled studies on the incidence of problem drinking in samples of both accident-involved and non-accident-involved persons in the general driving population, based on the same indicators of problem drinking, is needed. This type of data is available from only one study.

3. Data from Controlled Studies

Data on the relative involvement of problem drinkers in traffic crashes as compared to their presence in a control group of licensed drivers matched by age, sex, and residential area to the accident group is available from a recent study of fatal traffic accidents (Boston University School of Law, 1976). Employing the same indicators of problem drinking, researchers evaluated drivers in both the accident and control groups. Results indicated that 40% of drivers judged most responsible for fatal accidents, as compared to 19% of drivers in the control group, were identifiable as problem drinkers. This data, presented in Table T-25, indicates that problem drinkers are responsible for more than twice as many fatal accidents as would be expected based on their proportion in the general driving population.

Additional data presented in this table reveals the varied role problem drinkers play in different types of fatal accidents. Analyzing each type of crash separately, researchers found that 48% of drivers who were responsible for their own fatal injury (Accident Type I), 41% of drivers who survived the crash but who were responsible for fatally injuring another vehicle occupant (Accident Type II), and 31% of drivers who fatally injured a pedestrian (Accident Type III) were identified as problem drinkers.

TABLE T-25

PROBLEM DRINKER EVALUATIONS FOR ACCIDENT AND CONTROL SAMPLES

Problem Drinker Evaluations	Accident Types				Control
	I	II	III	All	All
Yes	48%	41%	31%	40%	19%
No	52%	59%	69%	60%	81%
	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>

Source: Boston University School of Law, 1976

In further analysis, the association between a history of problem drinking and alcohol use at the time of the accident was examined. When drivers in all types of crashes who had BACs of .05% or higher, or who had a clinical evaluation of the same, were analyzed separately, 63% of these drivers were evaluated as problem drinkers, as compared to only 25% of accident-involved drivers without evidence of appreciable drinking at the time of the crash. This data is presented in Table T-26.

TABLE T-26

PROBLEM DRINKER HISTORIES FOR DRIVERS IN ALCOHOL-RELATED AND NON-ALCOHOL RELATED ACCIDENTS AND IN THE CONTROL SAMPLE

Drinking History	Accident Types		Control
	Alcohol- related ^a	Non-Alcohol related	All
Problem Drinker	63%	25%	19%
Social Drinker	37%	62%	68%
Abstainer	0%	13%	13%
	<u>100%</u>	<u>100%</u>	<u>100%</u>

^aAlcohol-related accidents involve drivers with a BAC >.05%, if available, or a clinical evaluation of the same.

Source: Boston University School of Law, 1976.

Data in this table indicates that problem drinkers are over-represented in both alcohol-related and non-alcohol-related accidents in terms of their proportion in the control group. However, the extent to which problem drinkers are over-represented in non-alcohol-related crashes is rather small as compared to their much greater over-representation in alcohol-related accidents. In fact, the distribution of drinking histories for the drivers in non-alcohol-related accidents and in the control group are quite similar.

In summary, data from this study has shown that problem drinkers are responsible for greater numbers of fatal traffic accidents of all types than can be accounted for by their representation in the general driving population. The largest proportion of problem drinkers was evidenced in alcohol-related crashes and in accidents in which the drivers were responsible for their own fatal injury.

4. Summary

It has been a much publicized fact over the last twenty years that the problem drinker or alcoholic is involved in the majority of alcohol-related traffic accidents and deaths. Yet, the range of estimates of the involvement of this group is so large and the variation in definitional criteria used to identify problem drinkers is so great, that it becomes almost impossible to assess the actual degree of involvement of problem drinkers and alcoholics in traffic accidents and violations on the basis of these studies. In addition, as the majority of work in this area has relied on samples of persons in alcohol-related crashes or fatal accidents, and persons convicted of drunken or impaired driving, knowledge of the role of problem drinkers and alcoholics in the overall traffic problem is limited.

Comparison of general population data on the incidence of problem drinking with roughly similar data on problem drinking of drivers fatally injured in traffic crashes has cast substantial doubt on reports that alcoholics and problem drinkers are heavily over-involved in traffic problems.

However, data from the one available controlled study of the role of problem drinkers in traffic crashes has suggested that problem drinkers are over-represented in the group of drivers judged by researchers to be responsible for fatal traffic crashes, as compared to their proportion in the control group.

It would seem, then, that problem drinkers are involved in a substantial number of traffic crashes and violations, but the exact proportion is still unknown. If the actual role of alcoholics and problem drinkers in the overall traffic problem is to be assessed, more detailed information on operational definitions used to identify them, as well as some effort to standardize these indicators of problem drinking across studies, would seem in order.

V. DRIVING RECORDS OF ALCOHOLICS AND DWI OFFENDERS

A. Alcoholics

The role of alcoholics in traffic crashes and violations has been examined from a second perspective. Several studies have analyzed the driving records of alcoholics in an effort to compare the relative number of accidents and violations contained in the driving records of these alcoholics with the number of similar accidents and violations in the driving records of non-alcoholics or in those of the general population. These studies have relied either on clinic or hospitalized samples of alcoholics or on identifiable alcoholics in samples of accident-involved drivers.

Several studies have presented evidence demonstrating that alcoholics as a group have significantly greater numbers of traffic accidents and violations, as seen in their driving records, than the general population or non-alcoholics (Schmidt, Smart, and Popham, 1962; Waller, 1965; Waller, 1968; Selzer, 1969a, b; Filkins, et al., 1970). One study found that alcoholics presently under treatment had a greater average number of accidents per capita and per mile driven than would be expected based on general population statistics (Schmidt, Smart, and Popham, 1962). These alcoholics also had a greater average number of license suspensions and convictions for drunken driving than the general population.

Another study of alcoholics and persons with other chronic medical conditions known to the California Department of Motor Vehicles, found that alcoholics had 1.7 times as many accidents and 1.8 times as many moving violations as did a sample of persons renewing their driver's licenses (Waller, 1965). Alcoholics not currently under treatment were also found by one researcher to have a greater average number of serious accidents,

as well as greater average numbers of total accidents and moving violations, than did non-alcoholics in a sample of drivers involved in fatal traffic crashes (Selzer, 1969b).

On the basis of these and other research findings various researchers have claimed that alcoholics and problem drinkers constitute a "high risk group" which contributes disproportionately to traffic accidents and violations.

Focusing on the proportion of alcoholics that have traffic crashes and violations on their driving and/or criminal arrest records, rather than on the average number of accidents and violations of alcoholics as a group, provides a framework with which to assess whether the majority of alcoholics are over-involved in traffic crashes or whether a smaller group of alcoholics with a large number of crashes are responsible for the greater mean number of crashes for alcoholics as a group. Analysis of this same type of data from samples of the general driving population can, then, provide a comparison group with which to assess the degree to which the number of alcoholics with traffic crashes and violations on their driving and/or criminal records differs from the proportion of the general population with a record of these driving problems.

Data in Table T-27^{*}, compiled from several studies, reveals that 24-47% of alcoholics have at least one traffic crash on their driving record, while 11-26%, with the exception of one study which used self-reported data (Selzer and Vinokur, 1975), have at least one conviction for drunken or impaired driving, and 48-66% have at least one moving violation.

Comparing this type of data from the driving records of hospitalized alcoholics with similar data from a sample of the general driving population, one study (Filkens et al., 1970) found that a larger proportion of alcoholics

* See also Chart IIIA and IIIB in Chapter One of this report.

Table T-27 Empirical Studies--
Traffic--Driving Records of Alcoholics*

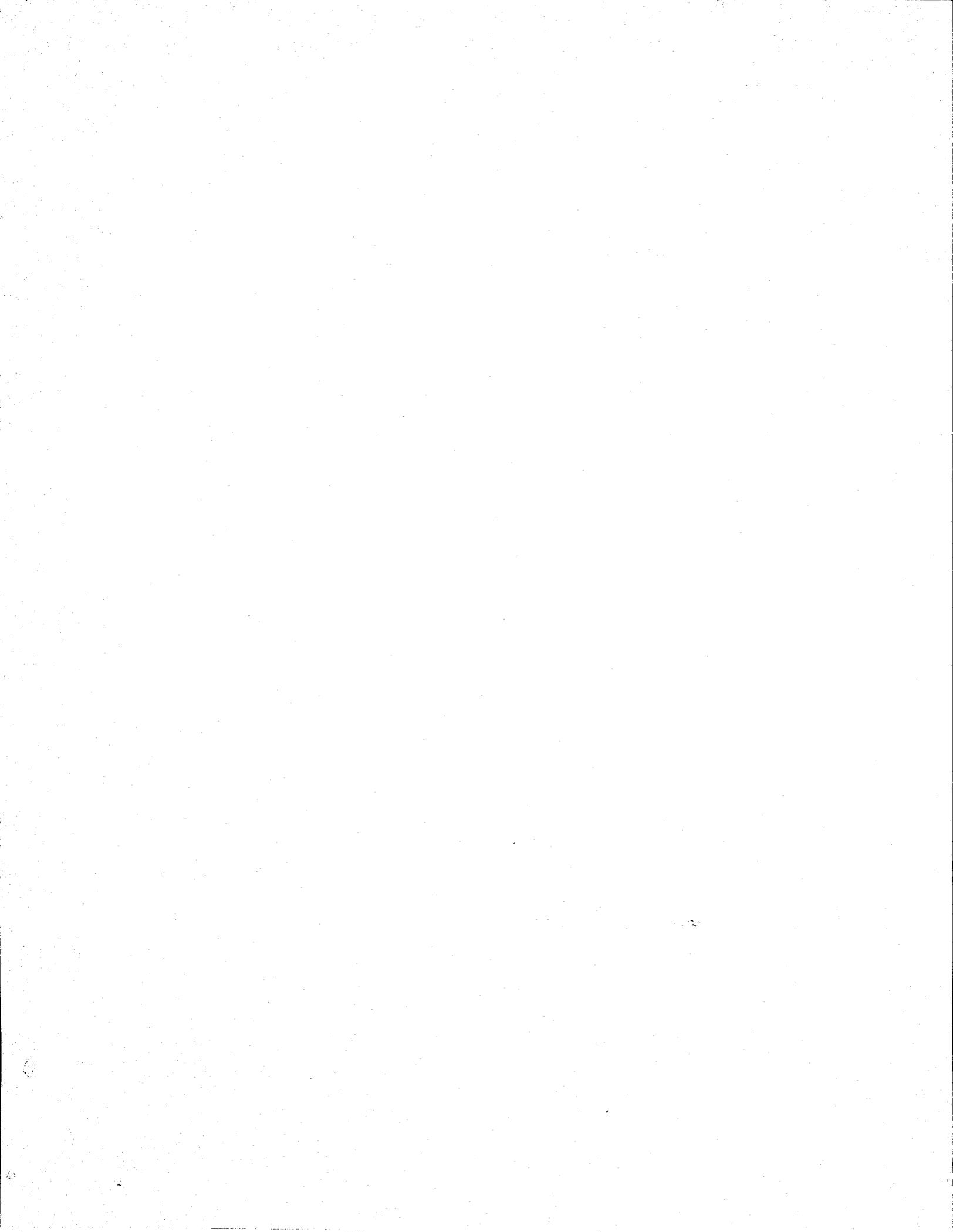
Author, Date, Location	Sample	% with previous DWI con- victions	% with reckless driving convic- tions	% with traffic viola- tions (all)	% with traffic acci- dents	% with non-traffic alcohol re- lated arrests	Time period driver's records checked
<u>United States</u>							
Waller, 1968 b California	1) 256 drivers known to the Calif. Dept. of Motor Vehicles with primary diagnosis of alcoholism	--	--	--	30	--	3 yrs.
	2) 126 drivers known to the Calif. Dept. of Motor Vehicles for other chronic medical conditions but with secondary diagnoses of alcoholism	--	--	--	33	--	3 yrs.
Selzer, 1969 b Michigan	1) 36 alcoholics identified by a history of alcohol-related problems from a total of 96 drivers judged by police to be responsible for fatal accidents**	17	--	61	47	11	3 yrs.
	2) 118 white male hospitalized alcoholics	14	--	48	24	18	3 yrs.
Filkins et al., 1970 Michigan	1247 alcoholics admitted to hospitals who had either a valid driver's license or if no license, had a record of driving convictions and/or crashes	16.5	10	66	40	46	6½ yrs.
Rosenberg et al., 1972 Maryland	5157 Maryland residents with a psychiatric diagnosis of alcoholism from inpatient and outpatient facilities	10.9+	--	--	--	--	7 yrs.
Selzer & Vinokur, 1975 Michigan	289 male alcoholics of which 126 men were clinic outpatients and 163 men were hospitalized	56++	--	--	--	--	n/a
<u>Canadian</u>							
Schmidt and Smart, 1959 Ontario, Canada	98 male alcoholics hospitalized for at least 9 days who had had a driver's license at some time during twelve years covered by study	26.5	--	--	--	--	12 yrs

* Based on official drivers and/or criminal arrest records unless otherwise stated.

** Statistics based on the driving records of these 36 alcoholics have been reported in 2 additional articles; certain percentages vary; this study was chosen as it offers the most complete information on driver's records.

+ Had driver's licenses revoked because of drunken driving.

++ Had been arrested for DWI by self-report.



than of the general driving population had records of crashes and violations. While 71% of a random sample of drivers had no record of crashes, only 60% of the alcoholics were similarly accident-free. In addition, only 8% of the random sample of drivers had a record of two or more crashes, whereas 14% of the alcoholics had a record of this type. With respect to DWI convictions, only 1% of the random sample of drivers, but 16% of the alcoholics, had a record of this type of traffic violation. Finally, while 47% of the random sample of drivers had no moving violations, only 34% of the hospitalized alcoholics had no record of moving violations.

Data from this study suggests, then, that although only a relatively small proportion of all alcoholics have records of traffic crashes and violations, this proportion is still greater than the proportion of the general driving population with records of traffic crashes and violations.

Data presented in this section has indicated that not only do alcoholics as a group have a greater average number of crashes and violations than do non-alcoholics or the general driving population, but also that a larger proportion of alcoholics than of the general driving population have a record of crashes and violations.

Generalizations like the above, however, do not take into account either the complexity of underlying factors in the accident-involvement of alcoholics or the methodological constraints which may influence the proportion of alcoholics that are found to have records of traffic crashes and violations.

1. Methodological Constraints

One possible source of bias in these studies of the driving records of alcoholics is the prevailing tendency on the part of researchers to select samples of hospitalized alcoholics with current driver's licenses, sometimes including alcoholics without licenses but with records of traffic accidents

or violations. (See, for example, the sample description for Filkins et al., 1970 in Table T-27). These samples are, then, not representative of alcoholics in the general population, or of alcoholics in treatment, or of alcoholics in treatment with current driver's licenses. Moreover, inclusion of persons without current licenses but with records of traffic crashes and violations in these samples of alcoholics obviously inflates the proportion of alcoholics with records of traffic problems.

There is also some evidence that traffic crashes may actually bring alcoholics into treatment, thus inflating the proportion of hospitalized alcoholics with records of crashes as compared to the proportion of alcoholics currently not in treatment who have records of traffic problems. As one study pointed out, nearly three times as many institutionalized alcoholics had had an accident in the 12 months preceding their admission as in any other similar period of time in the 12 years covered by the study (Schmidt and Smart, 1959). The authors caution that if this finding indicates that traffic accidents contribute significantly to the process which brings alcoholics to treatment facilities, there would then be more accident-involved drivers among treated alcoholics than among alcoholics in the general population.

In addition, other studies have relied on samples of alcoholics and problem drinkers identified from larger samples of accident-involved persons, groups with already established driving and drinking problems. It would seem, then, that these types of samples would tend to inflate the proportion of alcoholics and problem drinkers with records of traffic crashes and violations. It is certain that these alcoholics are not representative of alcoholics or problem drinkers in the general population.

2. Personality and Psychological Factors

By the early 1960s it became apparent to some researchers that although considerable research effort had been concentrated on the extent to which persons involved in traffic accidents had been drinking, and on the extent to which alcoholics and problem drinkers were involved in these accidents and violations, little was yet known about the nature of the relationship between alcohol and traffic accidents. Nor was sufficient data available to answer the question of whether the frequent use of alcohol alone contributed to the high accident rates of alcoholics and problem drinkers, or whether personality traits and other factors associated with the alcoholic lifestyle were in part responsible for their over-involvement in traffic crashes and violations.

Certain researchers believed that physiological impairment of the sensorimotor functions caused by excessive alcohol consumption was the most important factor responsible for alcohol-related traffic accidents (Waller, 1969). Other researchers thought that personality traits such as hostility, depression, impulsivity, and suicidal tendencies, released or induced by alcohol, were the most significant factors in these accidents (Smart, 1969).

Much of the work done in the area of personality traits and accident-involvement of alcoholics was initiated by Selzer and associates. Their findings (Selzer, 1961; Selzer et al., 1963; Selzer et al., 1967; Selzer, 1969b; Selzer et al., 1974; Selzer et al., 1975) as well as those of other researchers (Carpenter, 1968; Smart, 1969; Smart et al., 1969; Pokorny et al., 1972; Mozdierz et al., 1975) have demonstrated that certain personality factors such as hostility, depression, impulsivity, paranoid thinking, decreased

tolerance to tension, recent stress, and suicidal tendencies are present in a significant number of accident-involved alcoholics.

In research focusing specifically on the role of stress in the accident-involvement of alcoholics, one study (Selzer, 1969b) found that 72% of the alcoholics and 42% of the non-alcoholics in a group of drivers judged responsible for fatal accidents had experienced one or more crises in the prior 12 months. In a six-hour period immediately preceding the fatal accident, 31% of the alcoholics had experienced acute stress, as compared with only 13% of the non-alcoholics.

In another study (Brenner and Selzer, 1969) of this same group of drivers, the risk of causing a fatal accident associated with patterns of alcohol use, psychopathology, and stress was calculated. On the basis of patterns of alcohol use alone, alcoholics were 21 times as likely to cause a fatal accident as were moderate users. When recent stress was combined with identification as an alcoholic, the relative risk factor was 32 times that of moderate users without recent stress, the highest risk factor associated with causing a fatal accident observed in the study. Alcoholics were also found to be 39 times more likely to cause a single vehicle fatal accident than moderate users.

It should be pointed out, however, that a history of alcohol-related interpersonal, social and economics problems formed the basis for identifying alcoholics in this group of drivers. Thus, relative risk factors attributed to alcoholics may in fact also be measuring the stress and other such problems used originally to identify the alcoholics in the sample of accident involved drivers. As pointed out by Brenner and Selzer, certain types of disturbing

events may provide one of the mechanisms whereby alcoholism can increase accident risk. On the other hand, the estimated effect of alcoholism on accident risk may be inflated by the effect of disturbing events which are more frequent among alcoholics but which cannot be said to be caused by alcoholism.

More recently, research attention has been specifically focused on life change events such as divorce, job change, and financial difficulties, as well as on recent stress. One study (Selzer and Vinokur, 1974) found that both life change variables and current stress were more strongly statistically related to traffic accidents than common demographic, personality, and social maladjustment variables often focused on in other research.

The role of personality traits, recent stress, and life changes has not been the focus of a sufficient quantity of research, as of yet, to fully answer the question of whether alcohol alone or some combination of alcohol and these other personality and life event factors are responsible for the over-involvement of alcoholics in traffic crashes. However, there are indications from this and other research that accident-involvement, for alcoholics as well as the general driving population, is a complex process which should not be attributed solely to the effects of alcohol on the sensorimotor functions.

B. DWI Offenders

The driving records of DWI offenders have been the focus of several studies in the alcohol traffic field. As much of this field in general and the majority of studies of DWI offenders in particular are oriented toward prevention of further involvement in traffic problems, an analysis of the

proportion of DWI offenders who have records of previous DWI convictions and traffic crashes provides one measure of the extent to which this group of offenders is repetitively involved in traffic problems.

Data from a number of studies on the proportion of DWI offenders who have records of previous traffic crashes and violations has been compiled in Table T-28.* The driving records of these DWI offenders reveal that 7-46% of DWIs have had a previous conviction for drunken or impaired driving. However, of the twelve groups of DWI offenders reported in this table, eleven revealed that only 7-22% of DWIs had previous convictions of this type. One study reported in this table (Minnesota Alcohol Programs for Highway Safety, 1972) reflects the consistency of these findings over a seven year period. This study searched the driving records of all persons convicted of DWI for five years prior to the current conviction. In each of the seven groups of DWIs studied between 1966 and 1972, the proportion of persons with a previous DWI conviction ranged from 15.9% to 20.4%.

A second study presented in Table T-28 (Argeriou and Paulino, 1976) reveals some variation in the proportion of DWI offenders with previous convictions for impaired or drunken driving according to the sex of the offender. Whereas 20% of male offenders had previous DWI convictions, only 7% of women offenders had a record of previous DWI offenses.

Data in Table T-28 also indicates that 46-66% of DWI offenders had records of traffic crashes and 25-92% had records of moving violations. Although several studies have found that large proportions of DWI offenders have records of moving violations, it is interesting to note that in two studies (Kaestner et al., 1969; Filkins et al., 1970) in which 83% and 92% of DWIs had records of moving violations, only 14% of both groups had reckless driving convictions (a charge often substituted for drunk driving

* See also Chart IIIA and IIIB in Chapter One of this report.

Table T-28 Empirical Studies--
Traffic--Driving Records of DWIs*

Author, Date, Location	Sample	% with previous DWI con- victions	% with reckless driving convic- tions	% with traffic viola- tions (all)	% with traffic acci- dents	% with non-traffic alcohol related arrests	Time period drivers records checked
<u>United States</u>							
Waller, 1967, Oakland, CA.	150 male residents of Oakland, CA., convicted of drunken driving or for being drunk in or about a vehicle.	46	--	--	--	59	3 yrs.
Kaestner et al., 1969	798 residents of Oregon convicted of driving under the influence of intoxi- cating liquor--subset of 1,025 residents and non-residents whose arrest abstracts were processed by Motor Vehicles Division of the Oregon Dept. of Transportation.	22	14	83	46	--	4 yrs.
Filkins et al., 1970 Detroit, Wayne Co., Mich.	Random sample of 169 persons convicted of impaired or drunken driving in Detroit Recorder's Court.	12	14	92	66	--	6½ yrs.
Perrine, et al., 1971 Vermont	Random sample of 50 drivers in Vermont Motor Vehicle Dept. files who had been convicted of driving-while-intoxicated.	--	--	70	52**	--	5 yrs.
Kelleher, 1971 Cook Co., Ill.	250 drivers convicted of driving while intoxicated.	13	--	--	--	--	--
Minn. Alcohol Programs for Highway Safety, 1972 Minn.	All persons convicted of DWI 5,792 in 1966 5,977 in 1967 7,431 in 1968 8,471 in 1969 8,634 in 1970 9,687 in 1971 11,303 in 1972	19.2 15.9 17.1 17.6 20.4 19.8 20.1	--	--	--	--	5 yrs. pds. prior to current DWI conviction for all yrs. reported.
Argeriou and Paulino, 1976, Boston, Mass.	1) 73 women arrested for DWI in Boston 2) 1514 (77% of the 1964 men and women arrested for DWI in Boston (98% of sample were men).	7 29	-- --	25+ 85+	-- --	-- --	-- --

*Based on official drivers and/or criminal arrest records unless otherwise stated.

** Self-reported data.

+ Other than DWI.

in plea bargaining).

Differences between male and female DWI offenders in terms of the proportion with records of moving violations are quite substantial, as seen in data from a recent study in Table T-28 (Argeriou and Paulino, 1976). Although 85% of male offenders in this study had records of moving violations other than DWI, only 25% of female offenders had records of this type.

A general comparison of data on the driving records of DWI offenders and labelled alcoholics, as seen in the two previous tables, suggests that a larger proportion of DWIs (46-66%) than of labelled alcoholics (24-47%) have records of traffic crashes. Similarly, a larger proportion of DWIs (25-92%) than of labelled alcoholics (48-66%) have been found to have records of moving violations. With respect to previous DWI convictions, the pattern is somewhat different. Although the range across studies in the proportion of DWI offenders with records of previous convictions for impaired or drunken driving is 7-46%, it was previously noted that with the exception of one study (Waller, 1967) the range was reduced to 7-22%. Similarly, the proportion of labelled alcoholics with records of DWI convictions is 11-56%. With the exception of one study (Selzer and Vinokur, 1975) which used self-reported data, the range is only 11-26%. Thus, the proportions of DWIs and labelled alcoholics with records of impaired or drunken driving convictions are quite similar.

A comparison of the driving records of DWI offenders with similar data from the general driving population provides a measure of the relative involvement of DWIs in the overall traffic problem. Data from one study (Perrine et al., 1971) provides information on the driving records of DWI offenders, other traffic violators and a group of drivers in the general driving population, sampled at times and places corresponding to traffic

accidents. As seen in Table T-29, the proportion of DWI offenders who reported that they had had no traffic crashes in the previous five years (62%) closely approximated the proportion of drivers in the control group who reported they had a clear record in terms of traffic crashes during the past five years (66%). In contrast, a much smaller proportion of non-DWI traffic violators (35%) reported no crashes in the past five years. It is interesting to note, however, that the proportion of drivers who reported two or more crashes in the previous five years is greater for DWI offenders and

TABLE T-29

DISTRIBUTION OF CRASHES AND CITATIONS
FOR DWI OFFENDERS, OTHER TRAFFIC
VIOLATORS AND CONTROL GROUP DRIVERS
(IN PERCENT)

	<u>DWI Group</u>	<u>Non-DWI Citation Group</u>	<u>Roadblock Control Group</u>
<u>Crashes/ 5 years</u>			
None	62	35	66.
One	18	23	25
Two or more	<u>20</u>	<u>42</u>	<u>9</u>
Total	100	100	100
(N)	(50)	(40)	(1154)
<u>Citations/ 5 years</u>			
None	30	28	82
One	32	38	13
Two or more	<u>38</u>	<u>35</u>	<u>5</u>
Total	100	100	100
(N)	(50)	(40)	(898)

Source: Perrine et al., 1971

particularly for non-DWI traffic violators than for control group drivers.

A different pattern is apparent in the official records of traffic citations for these three groups of drivers. With respect to citations during the past five years, a substantially smaller proportion of both DWI offenders (30%) and non-DWI traffic violators (28%) than of control group drivers (82%) had no record of traffic citations. Moreover, the proportion of drivers with two or more citations was considerably larger in both the DWI group (38%) and the non-DWI citation group (35%) than in the control group (5%).

Comparative data from another study (Filkins et al., 1970) on the driving records of DWI offenders and a random sample of the general population reveals somewhat different trends. In the previous study the proportions of DWI offenders and drivers in the control group who reported no history of traffic crashes in the past five years were quite similar. In contrast, data from the Filkins et al. study indicates that a considerably larger proportion of DWIs (66%) than of the random sample of drivers (29%) have records of previous traffic crashes. Data from this study also indicated that a larger proportion of DWIs than of the random sample of drivers had records of previous DWI convictions and other moving violations.

Summary

Data on the driving records of labelled alcoholics and DWI offenders has shown that a larger proportion of these two groups than of the general population have records of traffic crashes and violations. In this respect, alcoholics and DWIs play a greater role in traffic problems than does the

general population.

Comparison of the driving records of labelled alcoholics with those of DWI offenders has shown that, overall, DWIs are apparently involved in traffic problems to a larger extent than are alcoholics.

VI. CONCLUSION

The relationship between alcohol and traffic crashes can be examined on two different levels. The first consists of assessing current beliefs on the role of alcohol in crashes, both those of researchers and those of policy-makers. The second level of analysis directly examines and evaluates the actual empirical evidence and theory which purport to explain the relationship of alcohol and traffic accidents.

Taking the first posture and examining current beliefs concerning alcohol as a factor in traffic crashes reveals a number of generally accepted "social facts". First, alcohol has been viewed as the single most important factor in the chain of events that lead to traffic crashes by both researchers and policy-makers. Of all the potential variables for study in the traffic field, alcohol has been the most extensively researched. Policy decisions and legislation concerning traffic accidents have focused to a significantly large extent on alcohol and its role in crashes. Second, it has been a much publicized fact that the problem drinker or alcoholic is involved in a substantial proportion of traffic crashes and violations. Increasingly in recent years legislation to reduce drunken driving has been aimed at this "high risk" group.

Examining the empirical evidence relevant to these generally accepted beliefs reveals, however, that variation across studies in research findings on both the prevalence of alcohol in traffic crashes and on the role of the problem drinkers and alcoholics in traffic accidents has been largely ignored.

Research has consistently shown that alcohol is involved in substantial numbers of traffic crashes. The consistency of this statistical association

is, however, mitigated by the large degree of variation across studies in alcohol-involvement figures. Moreover, information linking specific alcohol theories with empirical evidence of the prevalence of alcohol in traffic crashes is not yet readily available. Thus, although literally hundreds of studies have shown a statistical association between alcohol use and traffic crashes, knowledge of the actual proportion of crashes that involve drinking drivers and of the specific effects of alcohol on driving that may contribute to traffic crashes is still lacking.

In addition, research which offers data on the interrelationship of alcohol and such factors as fatigue or speed of vehicle is rare. In the final analysis, then, it must be concluded that alcohol is one of the significant factors in the causal chain of events which lead to traffic crashes, but that the precise contribution of alcohol to traffic accidents is not yet known.

Empirical evidence which can be brought to bear on the role of the problem drinker in traffic crashes and violations is generally much weaker than data on the prevalence of alcohol in traffic accidents. Research has revealed substantial variation in operational definitions of problem drinking and alcoholism, and marked differences across studies in the proportion of traffic accidents and violations that involve this group of labelled alcoholics and problem drinkers. As a result, the actual role of the problem drinker in the overall traffic problem remains unclear.

Research based on the driving records of hospitalized and accident-involved alcoholics has indicated that a larger proportion of these labelled alcoholics than of the general driving population have official records of previous traffic crashes, drunken driving convictions and traffic violations.

The driving records of persons convicted of drunken driving reveal even greater proportions of drivers with official records of other traffic problems. Yet, research has not yet determined whether the frequent use of alcohol alone contributes to the over-involvement of alcoholics in traffic accidents and violations, or whether other factors associated with the alcoholic lifestyle play a role in the events leading to traffic problems.

Thus, although research has clearly indicated that alcohol plays a substantial role in traffic problems, both at the time of the accident and in the personal histories of accident-involved persons, any general, single-cause model of traffic accidents cannot account for the intricate inter-relationships of personality, situational and demographic factors in the chain of events which lead to traffic crashes.

FOOTNOTES

1. The terms traffic "crash" and traffic "accident" will be used interchangeably in this report. As certain researchers have pointed out, "accident" has popular acceptance but implies that the event was unintentional and beyond control. However, "crash" emphasizes the event rather than its origins, but implies a collision, which may not occur in all "accidents" (Pelz, et al., 1975).
2. Data on the proportion of accident-involved persons who had attained specific BAC levels at the time of the crash, as presented in Figure T-1 and in all subsequent analysis, is in all cases a proportion of those persons who were tested for blood alcohol content, rather than a proportion of the entire sample of persons involved in traffic accidents. The need for this distinction is discussed in the section on Methodological Constraints, page 167.
3. As a result of the large number of cells generated in this analysis, many of the cells contain only a very small number of cases. Thus, observations based on this data must be considered only tentative and illustrative of general trends which require substantially larger samples for adequate analytical support.
4. Responsibility for "causing" an accident was determined somewhat differently in this study than in other studies which focus on the driver's responsibility for a crash. In this study, the subset of drivers who were labelled responsible for causing a multi-vehicle crash were selected not on the basis of some evaluation of the circumstances surrounding the accident, but rather on the basis of their blood alcohol content alone. The distributions of blood alcohol content of drivers in the control group and those involved in multi-vehicle accidents were jointly analyzed. On the assumption that one driver in a multi-vehicle accident is responsible for the accident and the second driver is not responsible, it was determined that one-half of all drivers should be labelled responsible and the other half non-responsible. On the second assumption that both non-responsible drivers and control group drivers are subsets of the general driving population, and thus have similar levels of blood alcohol content, the half of all drivers in multi-vehicle accidents who were labelled non-responsible was determined by selecting drivers in multi-vehicle accidents whose blood alcohol content best approximated the distribution of blood alcohol content among control group drivers. The remaining half of accident-involved drivers were labelled responsible for causing their accidents. As this procedure was based on several untested underlying assumptions, analysis based on data resulting from this procedure should be interpreted with caution, as suggested by the original researchers.
5. As discussed in footnote 4, non-responsible drivers in this study (Borkenstein et al., 1964) were selected by matching the distribution of their blood alcohol content to the distribution of blood alcohol content among control group drivers. Thus, the flatness of the relative risk curve associated with these non-responsible drivers is not surprising.

6. This statement refers to the overall tabulation of whether drivers typically abstain or drink any alcoholic beverages in the Perrine et al. (1971) study in Table T-16 rather than to the distributions of those who drink or abstain from a specific alcoholic beverage (i.e., beer or liquor). This overall data indicates that 21% of drivers in fatal and serious-injury crashes and 16% of control group drivers typically abstain from all alcoholic beverages.
7. This statement refers to the figures in parentheses in the Perrine et al. (1971) study in Table T-16. These numbers are based on only those drivers who report that they drink that particular alcoholic beverage. The proportions in parenthesis thus reflect the percentage of drinkers (not of all drivers) who drink either beer or liquor with the specified frequency.
8. These and subsequent results based on data on drinking patterns from this study must be interpreted with caution, as the sample size in both the fatal and hospitalized crash groups are quite small, as seen in Table T-16. Thus, many of the tabulations reported herein generate cells with only an extremely small number of cases.
9. For an explanation of the methods used in controlling for exposure to accidents and violations, see:

Pelz, D.C. and Schuman, S.H.
1971a Exposure Factors in Accidents and Violations of Young Drivers. Ann Arbor: Paper sponsored by the Highway Safety Research Institute, University of Michigan.
10. For a description of the specific items on alienation and hostility used in this study, see:

Pelz, D.C. and Schuman, S.H.
1974 "Drinking, hostility, and alienation in driving of young men."
Pp. 50-74 in Proceedings of the Third Annual Alcoholism Conference, NIAAA.
11. See footnote 9.
12. See footnote 10.
13. Drivers in the Non-DWI citation group were selected on the basis of one of the following types of violations: (1) careless and negligent driving, (2) leaving the scene of an accident, (3) driving while license suspended, (4) driving without a license, (5) operating without owner's consent, (6) violations of the law of the road, (7) failure to stop for a stop sign, or (8) vehicle operated with defective equipment.

TRAFFIC BIBLIOGRAPHY

- Allsop, R.E.
1966 Alcohol and Road Accidents: A Discussion of the Grand Rapids Study. (Pamphlet) Harmondsworth, England: Road Research Laboratory, pubs.
- Andréasson, R.
1962 "Alcohol and road traffic: An international survey of the discussions." Pp. 66-78 in the Proceedings of the Third International Conference on Alcohol and Road Traffic, London: Tavistock Square, B.M.A. House.
- Argeriou, M. and Paulino, D.
1976 "Women arrested for drunken driving in Boston." Journal of Studies On Alcohol, Vol. 37, No. 5, pp. 648-658.
- Bacon, S.
1968 "Traffic accidents involving alcohol in the U.S.A.; second-stage aspects of a social problem." Quarterly Journal of Studies on Alcohol, Supplement No. 4, pp. 11-33.
- Baker, J. Stannard
1955 "A framework for assessment of causes of automobile accidents." Chapter 6 in P.F. Lazarsfield and M. Rosenberg eds., The Language of Social Research, Glencoe: The Free Press.
- Baker, Susan P.
1970 "Characteristics of Fatally Injured Drivers." Report prepared under Dept. of Transportation Contract #FH-11-7092 at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.
- Baker, S.P.
1975 "Alcohol in fatal tractor trailer crashes." pp. 234-243 in D. Hueke ed., Proceedings of the 19th Conference of the American Association for Automotive Medicine, San Diego, California: November 20-22, 1975.
- Baker, Susan P.; Fisher, Russel S.; Masemore, William C. and Sopher, Irvin M.
1972 "Fatal unintentional carbon monoxide poisoning in motor vehicles." American Journal of Public Health, Vol. 62, No. 11, pp. 1463-1467.
- Baker, Susan P. and Robertson, Leon S.
1974 "How drivers prevented from driving would reach work: Implications for penalties." Accident Analysis and Prevention, Vol. 7, pp. 45-48.
- Baker, S.P.; Robertson, L.S. and Spitz, W.U.
1971 "Tattoos, alcohol, and violent death." Journal of Forensic Sciences, Vol. 4, No. 2, pp. 219-225.
- Baker, Susan P. and Spitz, Werner U.
1970a "Age effects and autopsy evidence of disease in fatally injured drivers." Journal of the American Medical Association, Vol. 214, No. 6, pp. 1079-1088.
- Baker, Susan P. and Spitz, Werner, U.
1970b "An evaluation of the hazard created by natural death at the wheel." New England Journal of Medicine, Vol. 283, No. 8, pp. 405-409.

- Bako, Gerda; MacKenzie, W.C. and Smith, E.S.O.
1976 "The effect of legislated lowering of the drinking age on fatal highway accidents among young drivers in Alberta, 1970-1972." Canadian Journal of Public Health, Vol. 67, No. 2, pp. 161-163.
- Baldwin, David M.
1963 "Accident records and research." Traffic Safety Research Review, Vol. 7, No. 3, pp. 6-8.
- Barry, H. III
1974 "Motivational and cognitive effects of alcohol." in M.W. Perrine ed., "Alcohol, Drugs, and Driving." Report prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, Report No. DOT HS-801 196.
- Beamish, J.J. and Malfetti, J.
1962 "A psychological comparison of violator and non-violator automobile drivers in the 16 to 19 year age group." Traffic Safety Research Review, Vol. 6, No. 1, pp. 12-15.
- Beaumont, K. and Newby, R.F.
1972 "Traffic law and road safety research in the United Kingdom - British countermeasures." Pp. 353-365 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.
- Beitel, G.A.; Glanz, W.D., and Sharp, M.C.
1975 "Probability of arrest while driving under the influence of alcohol." Journal of Studies on Alcohol, Vol. 36, No. 1, pp. 109-115.
- Bennet, Richard M.; Buss, Arnold H. and Carpenter, John A.
1969 "Alcohol and human physical aggression." Quarterly Journal of Studies on Alcohol, Vol. 30, No. 4, pp. 870-876.
- Biecheler, M. B.; Ramback, M. C.; Goffette, D. and Monseur, J. L.
1970 I.R.T. - O.N.S.E.R., Etude Alcool Conduite et Accidents de la Route, Juillet 1970.
- Birrell, J.H.W.
1965 "Blood alcohol levels in drunk drivers, drunk and disorderly subjects and moderate social drinkers." The Medical Journal of Australia, Vol. 2, No. 23, pp. 949-953.
- Birrell, J.H.
1971 "A comparison of the post-mortem blood-alcohol levels of drivers and passengers compared with those of drinking drivers who kill pedestrians." The Medical Journal of Australia, Vol. 2, No. 19, pp. 945-948.
- Birrell, J.H.
1972 "Alcohol and the young driver." Pp. 252-256 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.
- Ejerver, Kjell and Goldberg, Leonard
1950 "Effects of alcohol ingestion on driving ability, Results of practical road tests and laboratory experiments." Quarterly Journal of Studies on Alcohol, Vol. 11, No. 1, pp. 1-30.

- Blume, Sheila B.
1969 "Driving histories of alcoholics in a treatment unit." Psychiatric Quarterly, Vol. 43, pp. 734-743.
- Borkenstein, Robert F.
1967 "A realistic approach to drinking and driving." Traffic Safety, Vol. 67, No. 10, pp. 8-11, 35.
- Borkenstein, R.F. and Crowther, R.F.
1964 "Role of the drinking driver in traffic accidents: A summary." Traffic Digest and Review, Vol. 12, No. 6, pp. 4-7, 29.
- Borkenstein, R.F.; Crowther, R.F.; Shumate, R.P.; Ziel, W.B. and Zylman, R.
1964 The Role of the Drinking Driver in Traffic Accidents. Indiana: Indiana University.
- Boston University Law-Medicine Institute
1969 "Investigation of 31 Fatal Automobile Accidents. Final Report." U.S. Dept. of Transportation, Bureau of Highway Safety, Prepared under Contract No. FH 116 795.
- Boston University School of Law
1976 "Analysis Of Drivers Most Responsible For Fatal Accidents Versus A Control Sample." Final Report for U.S. Dept. of Transportation, #DOT HS-801-916.
- Boyd, Roland
1940 "Drunken driving: Don't change the law." Texas Bar Journal, 1940, pp. 487-488.
- Bradford, Lowell W.
1966 "Drinking driver enforcement problems." Journal of Criminal Law, Criminology, and Police Science, Vol. 57, No. 4, pp. 518-520.
- Brenner, B. and Selzer, M.L.
1969 "Risk of causing a fatal accident associated with alcoholism, psychopathology, and stress: Further analysis of previous data." Behavioral Science, Vol. 14 (6), November, pp. 490-495.
- Brodie, H. Keith H.
1973 "The effects of ethyl alcohol in man." Pp. 6-59 in Appendix, Drug Use in America: Problem in Perspective, The Technical Papers of the Second Report of the National Commission on Marihuana and Drug Abuse, Vol I.: Patterns and Consequences of Drug Use. Washington, D.C.: U.S. Government Printing Office.
- Brown, Stuart L.
1970 "Automobile death syndrome." Medical Insight, Vol. 2, No. 10, pp. 38-49.
- Cahalan, Don
1970 Problem Drinkers. San Francisco: Jossey-Bass, Inc.
- Cahalan, D.; Cisin, I.H. and Crossley, H.M.
1969 American Drinking Practices: A National Survey of Drinking Behavior and Attitudes. New Brunswick, N.J.: Rutgers Center of Alcohol Studies.
- Cahalan, D. and Room, R.
1974 Problem Drinking Among American Men. New Brunswick, New Jersey: Rutgers Center of Alcohol Studies.

California Highway Patrol, Department of

1965 "The Role of Carbon Monoxide, Alcohol, and Drugs in Fatal Single Car Accidents." Advance Report, C.H.P., Sacramento, California.

California Highway Patrol

1967 "Roles of Alcohol, Drugs, and Organic Factors in Fatal Single Vehicle Traffic Accidents." Final Report, C.H.P., Sacramento, California.

California Highway Patrol

1975 "Data Related to Lowering California's Drinking Age." Special report, CHP, Sacramento, California.

California State Automobile Association and the Automobile Club of Southern California

1968 Holiday Portrait 1968 Fourth of July Weekend - Labor Day Weekend (Pamphlet), San Francisco.

Campbell, B.J.

1966 "Driver age and sex related to accident time and type." Traffic Safety Research Review, June, pp. 36-43.

Campbell, Horace E.

1965 "The role of alcohol in fatal traffic 'accidents'." Traffic Safety, Vol. 65, No. 3, pp. 24-26, 36-37.

Campbell, Horace E.

1969 "Studies of driving and drinking." Quarterly Journal of Studies on Alcohol, Vol. 30, No. 2, pp. 457-458.

Carlson, W. L.

1972 "Alcohol usage of the nighttime driver." Journal of Safety Research, Vol. 4, No. 1, pp. 12-25.

Carlson, W.L.

1973 "Age, exposure and alcohol involvement in night crashes." Journal of Safety Research, Vol. 5, No. 4, pp. 247-259.

Carlson, W.L.; Compton, M.J.; Douglass, R.L. and Filkins, L.D.

1973 "Washtenaw County BAC Roadside Survey." Report prepared for Washtenaw Co. Alcohol Safety Action Program by the Highway Safety Research Institute, University of Michigan.

Carlson, W.L. and Clark, C.D.

1971 "Alcohol in the night: A summary." H.I.T. Lab Reports, November, pp. 1-3.

Carlson, W.L. and Klein, D.

1970 "Familial vs. institutional socialization of the young traffic offender." Journal of Safety Research, Vol. 2, No. 1, pp. 13-25.

Carpenter, John A.

1968 "Contributions from psychology to the study of drinking and driving." QJSA, Supp. 4, pp. 234-251.

Clark, C.D.

1972 "A comparison of the driving records and other characteristics of three alcohol-involved populations and a random sample of drivers." H.I.T. Lab Reports, No. 10, pp. 1-5.

- Clark, C.D.; Compton, M.J.; Douglass, R.L. and Filkins, L.D.
1973a "Three year comparison of alcohol related driving behavior in Washtenaw County, Michigan." H.I.T. Lab Reports, Vol. 4, No. 2, pp. 1-14.
- Clark, C.D.; Compton, M.J.; Douglass, R.L. and Filkins, L.D.
1973b "Washtenaw 1971, 1972, and 1973. Blood Alcohol Content (BAC) Roadside Surveys." University of Michigan, H.S.R.I., Ann Arbor, Michigan, August.
- Clark, John M. Jr.
1972 "Effect of alcohol and drugs on driver performance." Pp. 214-226 in Proceedings, Institute of Traffic Engineers,
- Clark, W.
1966 "Operational definitions of drinking problems and associated prevalence rates." QJSA, Vol. 27, No. 4, December, pp. 648-668.
- Coldwell, B.B. and Grant, G.L.
1963 "Drinking drivers in an eastern Ontario city." Journal of Forensic Sciences, Vol. 9, No. 2, pp. 271-287.
- Coppin, R.S.; Ferdun, G.S. and Peck, R.C.
1965 The Teen-Aged Driver; An Evaluation of Age, Maturity, Driving Exposure and Driver Training as They Relate to Driving Record. Sacramento, California: Department of Motor Vehicles.
- Cornoni, Joan C.
1972 "Comment on Dr. Perrine's Paper." pp. 75-78 in Alcohol and Highway Safety, Vol. III of the North Carolina Symposium on Highway Safety, Chapel Hill, N.C.: Highway Safety Research Center, pubs.
- Cosper, R. and Mozersky, K.
1968 "Social correlates of drinking and driving." QJSA, Suppl. 4, May, pp 58-117.
- Craig, G.B.
1975 "Annual Report of Fatal Injury Motor Vehicle Traffic Accidents - 1974." Prepared by Department of the California Highway Patrol, Sacramento, California.
- Craig, G.B.
1976 "Annual Report of Fatal Injury Motor Vehicle Traffic Accidents - 1975." Prepared by the Department of the California Highway Patrol, Sacramento, California.
- Crancer, A. Jr. and Quiring, D.L.
1968 "The Chronic Alcoholic As A Motor Vehicle Operator." Report of Washington State Department of Motor Vehicles.
- Davis, J.H.
1963 "Alcohol, violence and the automobile." Medical Examiner's Digest, Dade County, Florida, Board of Commissioners and the Dade County Manager, 1963.
- Davis, J.H.
1974 "Carbon monoxide, alcohol, and drugs in fatal automobile accidents -- Dade County, Florida, 1956-1968." Clinical Toxicology, Vol. 7, No. 6, pp. 597-613.

- Davis, J.H. and Fisk, A.J.
1966 "The Dade County, Florida, Study on Carbon Monoxide, Alcohol and Drugs in Fatal Single Vehicle Automobile Accidents." pp. 197-204 in Proceedings of National Association of Coroners Symposium.
- de Berge, E.
1976 "Impact of the Alcohol Safety Action Project holiday campaign: 'Friends don't let friends drink'." Report to the City of Phoenix ASAP.
- Dempster, J.W.S.
1969 "The Road Safety Act 1967 and its effect on road accidents in the United Kingdom." Traffic Digest and Review, Vol. 17, No. 8, pp. 3-8.
- Douglass, Richard L.
1973 "A strategy to measure the prevalence of late symptomatic alcoholism." HIT Lab Reports, Vol. 3, No. 7, pp. 7-13.
- Douglass, R.
1974 "The operational meaning of reported alcohol involvement in official state accident data: A comparative analysis." HIT Lab Reports, Vol. 4, No. 9, pp. 1-6.
- Douglass, Richard L.
1974 "Results of a legal impact study: The lower legal drinking age and youth crash involvement." HIT Lab Reports, Vol. 5, No. 2, pp. 1-15.
- Douglass, Richard L.
1975 Primary Prevention in Alcohol and Highway Safety: Research Needs. Paper presented at the National Council on Alcoholism Annual Meeting and Alcoholism Forum, Milwaukee, Wisconsin, April 30, 1975.
- Douglass, R.L. and Filkins, L.D.
1974a "The Effects of Lower Drinking Ages on Young Crash Involvement." Interim report on DOT Contract No. HS-031-754.
- Douglass, Richard L. and Filkins, Lyle D.
1974b "Empirical development of a surrogate measure of alcohol involvement in official accident data." HIT Lab Reports, Vol. 4, No. 9, pp. 7-11.
- Drew, G.C.; Colquhoun, W.P. and Long, Hazel A.
1958 "Effect of small doses of alcohol on a skill resembling driving." British Medical Journal, October 25, pp. 993-999.
- Driessen, Gerald J. and Bryk, Joseph A.
1973 "Alcohol countermeasures: Solid rock and shifting sands." Journal of Safety Research, Vol. 5, No. 3, pp. 108-129.
- Dunn, P.J.
1972 "The young driver seen through the eyes of a young driver." Pp. 380-383 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.
- Ehrlich, N.J. and Selzer, M.L.
1967 "A screening program to detect alcoholism in traffic offenders." pp. 44-51 in Selzer, et al. eds., The Prevention of Highway Injury, Ann Arbor: Highway Safety Research Institute, University of Michigan.
- Epstein, J.D.
1971 "A preliminary report on alcohol-involved crashes in Washtenaw County, Michigan." Hit Lab Reports, August, pp. 1-7.

- Farris, R.; Malone, T.B. and Lilliefors, H.
1975 "A Comparison of Alcohol Involvement in Exposed and Injured Drivers." Report by the Essex Corporation, Alexandria, Virginia, prepared for National Highway Traffic Safety Administration, U.S. Dept. of Transportation under contract #DOT HS-4-00954,
- Fell, James C.
1975 "Synopsis of Accident Investigation Studies of the Alcohol/Drug Problem in Four ASAP Cities." Report from Office of Statistics and Analysis, National Highway Traffic Safety Administration, U.S. Dept. of Transportation.
- Ferrance, R.G. and Whitehead, P.C.
1975 "Fatal crashes among Michigan youth following reduction of the legal drinking age." Journal of Studies on Alcohol, Vol. 36, No. 1, pp. 171-177.
- Field, Alexander C. Jr.
1971 "The drinking driver." Traffic Digest and Review, Vol. 19, No. 5, pp. 1-5.
- Filkins, L.D. and Carlson, W.L.
1973 "Analysis and reporting of blood alcohol concentrations of Michigan traffic fatalities." HIT Lab Reports, Vol. 3, No. 7.
- Filkins, L.D.; Clark, C.D.; Rosenblatt, C.A.; Carlson, W.L.; Kerlan, N.W. and Manson, H.
1970 "Alcohol Abuse and Traffic Safety: A Study of Fatalities, D.W.I. Offenders, Alcoholics, and Court-Related Treatment Approaches." Final Report, Highway Safety Research Institute, University of Michigan, June, Contract FH-11-6555 and FH-11-7129.
- Filkins, Lyle D. and Minahan, Daniel J.
1969 "Capabilities and Requirements for Blood Alcohol Testing of Michigan Traffic Fatalities." Report prepared for State of Michigan Office of Highway Safety Planning.
- Fine, E.W. and Scoles, P.
1974 "Alcohol, alcoholism, and highway safety." Public Health Reviews, Vol. 3, No. 4, pp. 423-436.
- Fine, E.W.; Scoles, P. and Mulligan, M.
1975 "Under the influence: Characteristics and drinking practices of persons arrested the first time for drunk driving, with treatment implications." Public Health Reports, Vol. 90, No. 5, October, pp. 424-429.
- Finkle, B.S.
1969 "Drugs in drinking drivers: A study of 2,500 cases." Journal of Safety Research, Vol. 1, No. 4, pp. 179-183.
- Foldvory, L.A.
1965 "Analysis of age and experience of responsible and non-responsible drivers involved in motor cycle versus other motor vehicle collisions in Victoria 1961 and 1962." Journal of the Australian Road Research Board, pp. 3, 43-51.

- Fox, Bernard H.
1967 "Deterrents to drinking and driving in alcohol misusers." pp. 51-62 in Selzer, et al. eds., The Prevention of Highway Injury, Ann Arbor: Highway Safety Research Institute, University of Michigan.
- Fox, Bernard H.
1975 "The problem of countermeasures in drinking and driving." Traffic Quarterly, Vol. 19, No. 3, pp. 299-320.
- Freimuth, H.C.; Watts, S.R. and Fisher, R.S.
1958 "Alcohol and highway fatalities." Journal of Forensic Science, Vol. 3, pp. 66-71.
- Gay, T.J.; Coates, R.L.; Coggins, G.L.; Alexander, K.D. and Nayman, J.
1970 "Blood alcohol concentrations upon admissions to a hospital casualty department." Medical Journal of Australia, Vol. 2, No. 17, pp. 778-781.
- Geller, Henry A.; Damkot, David K. and Toussie, Sam R.
1975 "A data acquisition system for unobtrusive measurement of on-road driving behavior." Behavior Research Methods and Instrumentation, Vol. 7, No. 6, pp. 526-530.
- Gerber, S.R.
1971 Coroner's Statistical Report, Cuyahoga County, Cleveland, Ohio.
- Gerber, S.R.
1972 Coroner's Statistical Report, Cuyahoga County. Cleveland Ohio.
- Gerber, S.R.; Joliet, P.V. and Feegel, J.R.
1966 "Single motor vehicle accidents in Cuyahoga County, Ohio: 1958-1963." Journal of Forensic Sciences, Vol. 11, No. 2, pp. 144-151.
- Ghent, W.R.; Good, B.E.; McCrank, M.N.; Pritchard, B.; and Todd, T.
1970 "Investigation of automotive mishaps in Frontenac County (Ontario)." The Canadian Journal of Surgery, pp. 236-243.
- Goldstein, Leon G.
1964 "Human variables in traffic accidents: A digest of research." Traffic Safety, Vol. 8, No. 1, pp. 26-31.
- Gonzales, Thomas A. and Gettler, Alexander O.
1941 "Alcohol and the pedestrians in traffic accidents." Journal of the American Medical Association, Vol. 117, No. 18, pp. 1523-1525.
- Greenberg, L.A.
1968 "The pharmacology of alcohol and its relationship to drinking and driving." Quarterly Journal of Studies on Alcohol, Supplement No. 4, pp. 252-266.
- Grey Advertising
1974 "A Strategic Study for Communication Programs on Alcohol and Highway Safety: High School Study." Report to National Highway Traffic Safety Administration, Dept. of Transportation.
- Gusfield, J.R.
1972 "A Study of Drinking Drivers in San Diego County." Final Report to the Department of Public Health, County of San Diego.

- Guy, E.C.
1969 "Breathtesting: The breath of life." Traffic Digest and Review, Vol. 17, No. 11, pp. 7-10.
- Haddon, William Jr.
1970 "On the escape of tigers: An ecological note." Technology Review, Vol. 72, No. 7, pp. 45-47.
- Haddon, William Jr.
1972 "Road Safety Problems and Action Programs - The U.S. Approach." Pp. 579-612 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.
- Haddon, W. Jr. and Bradess, V.A.
1959 "Alcohol in the single vehicle fatal accident: Experience of Westchester County, New York." Journal of the American Medical Association, Vol. 169, pp. 1587-1593.
- Haddon, W. Jr.; Valien, P.; McCarrol, J.R. and Umberger, C.J.
1961 "A controlled investigation of the characteristics of adult pedestrians fatally injured by motor vehicles in Manhattan." Journal of Chronic Diseases, Vol. 14, pp. 655-678.
- Hanson, J.R. and Simions, J.N.
1970 "Alcohol-related highway accidents: A hospital survey." Minnesota Medicine, Vol. 53 (8), August, pp. 905-907.
- Harrington, D.M.
1972 "The young driver follow-up study; an evaluation of the role of human factors in the first four years of driving." Accident Analysis and Prevention, Vol. 4, pp. 191-240.
- Harrington, David M. and Peck, Raymond C.
1967 An Administrative Abstract of the 1964 California Driver Record Study. (Pamphlet) Sacramento, California: Department of Motor Vehicles.
- Hart, D.N.J.; Cotter, P.W. and Macbeth, W.A.A.G.
1975 "Christchurch traffic trauma survey: Part 1, blood alcohol analysis." The New Zealand Medical Journal, Vol. 81, No. 541, pp. 504-507.
- Hayslip, Bert, Jr.; Kapusinski, David; Darbes, Alex and Zeh, Robert
1976 "Evaluation of driving-while-intoxicated programs: Some methodological considerations." Journal of Studies on Alcohol, Vol. 37, No. 11, pp. 1742-1746.
- Heisse, H.A.
1934 "Alcohol and automobile accidents." Journal of the American Medical Association, Vol. 103, No. 10, September, pp. 739-741.
- Henderson, M.
1972 "Drinking and Driving: Sociological Aspects." Pp. 244-251 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.

Hetzel, B.S.

1972 "The Alcohol Problem." Pp. 639-645 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.

Highway Safety Research Institute

1976 "A Proposal Entitled: A Study of Alcohol-Related Casualties and Alcohol Beverage Market Response to Beverage Alcohol Availability Policies in Michigan." Prepared in response to request for proposal dated July 30, 1976, Office of Substance Abuse Services, Michigan Department of Public Health.

Hoffman, Lily

1973 "Alcohol and traffic safety: Screening out the drunken driver." pp. 79-101 in A. Etzioni and R. Kemp eds., Technological Shortcuts to Social Change, New York: Russel Sage.

Holcomb, R.L.

1938 "Alcohol in relation to traffic accidents." Journal of the American Medical Association, Vol. 111, No. 12, pp. 1076-1085.

Hossack, D.W.

1972 "Investigation of 400 people killed in road accidents with special reference to blood alcohol levels." The Medical Journal of Australia, Vol. 2, No. 5, pp. 255-258.

Hossack, D.W. and Brown, G.

1974 "The hard facts of the influence of alcohol on serious road accident casualties." The Medical Journal of Australia, Vol. 2, No. 13, pp. 473-479.

House, Elizabeth G.

1975 Traffic Records - Aids to Drinking Driver Control. Chapel Hill, N.C.: Paper (presented by Patricia F. Waller) at the National Safety Congress and Exposition, Highway Safety Research Center, University of North Carolina, Pub., Oct. 1, 1975

Howell, William Y. and Wilson, James E.

1970 "Blood alcohol and highway accidents." Traffic Engineering, Vol. 41, No. 1, pp. 12-17.

Hughes, F.

1965 "Research in safety education: The accident producing effects of drugs and alcohol." Transactions, Vol. 23, 1965 National Safety Congress, pp. 86.

Hurst, Paul M.

1971 "Correspondence: The blood alcohol distribution in drivers not involved in accidents." Quarterly Journal of Studies in Alcohol, Vol. 32, pp. 478-479.

- Hurst, P.M.
1973 "Epidemiological aspects of alcohol in driver crashes and citations." Journal of Safety Research, Vol. 5, No. 3, pp. 130-148.
- Hurst, Paul M.
1974 "Estimating the effectiveness of blood alcohol limits." pp. 87-99 in Perrine ed., Alcohol, Drugs and Driving, National Highway Traffic Safety Administration Technical Report, Department of Transportation, HS-801-096.
- Hyman, M.M.
1968 "Accident vulnerability and BAC of drivers by demographic characteristics." QJSA Supplement 4, May, pp. 34-56.
- Hyman, M.M.
1970 "Crash vulnerability and BAC of drivers according to their demographic characteristics." Pp. 129-153 in Proceedings of the 11th Annual Meeting of the American Association for Automotive Medicine, Springfield, Illinois: Charles C. Thomas.
- Hyman, M.M.; Helrich, A.R. and Besson, G.
1972 "Ascertaining police bias in arrests for drunken driving." QJSA Vol. 33, No. 1, pp. 148-159.
- Jacobsen, E.
1956 "Drinking habits and motor driving: An analysis of 207 offenders." pp. 105-116 in Acta Med. Leg. Soc., Vol. 9.
- Jamieson, Kenneth G.
1968 "Alcohol and driving: The breathalyser bogey." Medical Journal of Australia, Vol. 2, No. 10, pp. 426-433.
- Joscelyn, Kent B. and Streib, Victor L.
1972 "The public inebriate and the highway transportation system." pp. 73-85 in Proceedings of the Joint Conference on Alcohol Abuse and Alcoholism, Washington, D.C.: U.S. Government Printing Office.
- Kaestner, N.; Howard, Vinita and Warmoth, Edward
1969 Oregon Study of Drinking Drivers, 1969. (Pamphlet) Salem, Oregon: Oregon Department of Transportation.
- Katz, S.
1973 "How can impaired driver accidents be reduced?" Addictions, Vol. 20, No. 1, Spring, pp. 31-38.
- Keith, L.
1968 Bring 'Em Back Alive: A Study of 371 Fatal Accidents in Florida: May 30 - September 2, 1968. (Pamphlet) Miami, Florida: AAA, East Florida Division.
- Kelleher, E.J.
1971 "A diagnostic evaluation of 400 drinking drivers." Journal of Safety Research, Vol. 3, No. 2, pp. 52-55.
- Klein, Richard H. and Jex, Henry R.
1975 "Effects of alcohol on a critical tracking task." Quarterly Journal of Studies on Alcohol, Vol. 36, No. 1, pp. 11-20.
- Kowalski, J.M.; Fiorese, F.F. and Rose, N.J.
1967 "Blood alcohol levels in vehicular and pedestrian fatalities in Illinois." Illinois Medical Journal, Vol. 131, No. 5, pp. 659-661.

- Kraus, A.S.; Ghent, W.R.; Steele, R. and Thompson, M.G.
1970 "Pre-driving identification of young drivers with a high risk of accidents." Journal of Safety Research, Vol. 2, No. 2, pp. 55-66.
- Kreml, Franklin M.
1970 "Kreml proposes 3-point traffic accident prevention program." Traffic Digest and Review, Vol. 18, No. 8, pp. 11, 13-14.
- Kritz, L.B. and Nilson, G.
1967 "Young Drivers and Road Accidents." Official Swedish Council on Road Safety Research, Report from TRAG, Nr. 100.
- Laessig, R.H. and Waterworth, K.J.
1970 "Involvement of alcohol in fatalities of Wisconsin drivers." Public Health Reports, Vol. 85, No. 6, pp. 535-549.
- LeGarde, John C.
1975 An analysis of Farm Equipment Accidents on North Carolina Public Roads. (Pamphlet) Chapel Hill, N.C.: Highway Safety Research Center, University of North Carolina.
- Little, Joseph W.
1970 "A theory and empirical study of what deters drinking drivers, if, when and why!" Administrative Law Review, Vol. 23, No. 1, pp. 23-57.
- Little, Joseph W.
1975 Administration of Justice in Drunk Driving Cases. University of Florida Social Science Monograph Number 53. Gainesville: University Presses of Florida.
- Livingston, Charles F.
1973 "Alcohol countermeasures: A status report." Traffic Safety, Vol. 73, No. 2, pp. 8-10,36.
- Loomis, T.A. and West, T.C.
1958 "The influence of alcohol on automobile driving ability, an experimental study for the evaluation of certain medicological aspects." Quarterly Journal of Studies on Alcohol, Vol. 19, No. 1, pp. 30-46.
- Lucas, G.H.W.; Kalow, W.; McColl, G.D.; Griffith, B.A. and Smith, W.H.
1955 "Quantitative studies of the relationship between alcohol levels and motor vehicle accidents." pp. 132-142 in the Proceeding of the Second International Conference on Alcohol and Road Traffic. Toronto: Garden City Press Cooperatives.
- Lundman, Richard J.
1976 Police Work with Traffic Law Violators. Paper presented at the 71st Annual Meeting of the American Sociological Association, New York, New York, August 30, 1976.
- Malfetti, James L. and Simon, Kenneth J.
1974 "Evaluation of a program to rehabilitate drunken drivers." Traffic Quarterly, Vol. 28, No. 1, pp. 49-59.
- Marsden, W.E.
1972 "Alcohol and pedestrian fatalities: A study of fatal pedestrian collisions in San Diego County." Journal of Traffic Safety Education, Vol. 20, No. 1, pp. 32,34.

Marsden, W.E.

1973 "Motorcycle fatalities in San Diego County: A study of drinking motorcycle drivers." Journal of Traffic Safety Education, Vol. 20, No. 2, pp. 25.

Mason, M.F. and Dubowski, K.M.

1976 "Breath-alcohol analysis: Uses, methods, and some forensic problems - review and opinion." Journal of Forensic Sciences, Vol. 21, No. 1, pp. 9-41.

McBay, Arthur J.

1972 "Alcohol and highway fatalities: A study of 961 fatalities in North Carolina during the last six months of 1970." North Carolina Medical Journal, Vol. 33, No. 9, pp. 769-773.

McBay, A.J.; Hudson, R.P.; Hamrich, H. and Beaubier, J.

1974 "Alcohol Impairment in Highway Fatalities in North Carolina, 1972." Journal of Safety Research, Vol. 6, No. 4, pp. 177-181.

McCarrol, J.R. and Haddon, W.Jr.

1962 "A controlled study of fatal automobile accidents in New York City." Journal of Chronic Diseases, Vol. 15, pp. 811-826.

McFarland, R.A.

1964 "Alcohol and highway accidents--A summary of present knowledge." Traffic Digest and Review, Vol. 12, No. 5, pp. 30-32.

McGuire, Frederick L.

1973 "The nature of bias in official accident and violation records." Journal of Applied Psychology, Vol. 57, No. 3, pp. 300-305.

McGuire, F.L.

1975 "An Evaluation of the Orange County Alcohol Traffic Safety Project." Final Report to the Orange County Board of Supervisors.

Meister, Raymond

1967 "What do we know about alcohol and the driver." Traffic Safety, Vol. 67, No. 10, pp. 8-10, 32-34.

Miles, W.R.

1934 "Alcohol and motor vehicle drivers:" pp. 362-379 in Proceedings of the Thirteenth Annual Meeting of Highway Research Board, Washington, D.C.: National Research Council.

Miller, Floyd A.

1966 "A Computer Study into the Causes of 1965-1966 Traffic Deaths in Jacksonville, Florida." Report prepared for Jacksonville Police Dept.

Milner, Gerald

1976 "1976 report of an international symposium on drugs and driving." Austr. J. Alc. Drug Depce., Vol. 3, No. 3, pp. 76-81.

Minnesota Department of Public Safety

1973 Minnesota Alcohol Programs for Highway Safety, 1972. (Pamphlet) St. Paul, Minn.: Highway Safety and Research Section, Minnesota Department of Public Safety.

Mirochnick, P.

1967 "The drinking driver and motor vehicle accidents in Alberta for the period 1961 to 1965." Traffic Quarterly, Vol 21, No. 2, pp. 249-267.

- Monroe, David Geeting
1947 "The drinking driver: Problems of enforcement." Quarterly Journal of Studies on Alcohol, Vol. 8, No. 3, pp. 385-405.
- Moore, Robert A.
1967 "Drinking, driving, and death: An overview." pp. 20-29 in Selzer, Gikas, and Huelke, eds., The Prevention of Highway Injury, Ann Arbor, Mich.: University of Michigan, HSRI.
- Mortimer, R.G.; Kerlan, M.W.; Filkins, L.D. and Lower, J.S.
1972 "Identifying a major hazard on the highways - the problem driver." Police, Vol. 6, No. 8, pp. 17-24.
- Moskowitz, H.
1974 "Alcohol influences upon sensory motor function, visual perception, and attention." in M.W. Perrine ed., "Alcohol, Drugs, and Driving," report prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, Report No. DOT HS-801 196.
- "Motor Wagons"
1904 (Editorial) Quarterly Journal Inebriety 26, pp. 308-309.
Reprinted in Quarterly Journal of Studies on Alcohol, Suppl. 4 (May, 1968), opposite p. 1.
- Mozdzierz, Gerald J.; Macchitelli, Frank J.; Planek, Thomas W. and Lottman, Thomas J.
1975 "Personality and temperament differences between alcoholics with high and low records of traffic accidents and violations." Journal of Studies on Alcohol, Vol. 36, No. 3, pp. 395-399.
- Mulford, H.A.
1964 "Iowa's drinking driver, 1961: With a method for identifying drinking drivers in a survey sample." Social Problems, Vol. 12, No. 2, pp. 196-203.
- Nagel, D.A.; Burton, D.S. and Priest, J.R.
1973 "Motor vehicle accidents: Human causes and injuries sustained." Clinical Orthopaedics and Related Research, No. 92, May, pp. 239-250.
- National Highway Traffic Safety Administration
1971 The Alcohol Safety Countermeasures Program. (Pamphlet) Washington, D.C.: U.S. Government Printing Office.
- National Safety Council
1960 Motor Vehicle Deaths over Fourth of July 1960: A More Detailed Report of an Earlier Study. (Pamphlet) Chicago, Ill.: Safety Council.
- National Safety Council
1965 "Alcohol held big factor in California's July 4 crashes." Traffic Safety, Vol. 65, No. 2, pp. 10-12, 34-35.
- National Safety Council
1976 Accident Facts. (Pamphlet) Chicago, Ill.: National Safety Council.
- Neilson, R.A.
1963 "Alcohol Involvement in Fatal Accidents in Eight Large California Counties in 1962." Report of California Traffic Safety Foundation, San Francisco, California.
- Neilson, Royal A.
1964 "The deadly tranquilizer." Traffic Safety, Vol. 64, No. 4, pp. 8-10.

- Neilson, R.A.
1967 "A Survey of Post-Mortem Blood Alcohols from 41 Counties in 1966." Report from California Traffic Safety Foundation, San Francisco, California.
- Neilson, R.A.
1969 "A Survey of Alcohol Involvement from Selected California Counties 1962-1968." Report of California Traffic Safety Foundation.
- New Jersey Department of Law and Public Safety
1964 New Jersey Alcohol Determination Program in Fatal Accident Cases, 1961-1963. Report of Division of Motor Vehicles, Traffic Safety Service, Trenton, N.J.
- Newman, Bernard; Dibrberg, Arnold and Rivo, Julian
1971 "A study on arrests and disposition of alcohol-drugs and driving cases in New York State." Police, Nov., pp. 47-52.
- O'Day, James
1970a "Characteristics of alcohol involvement in Michigan fatalities 1966-1969." HIT Lab Reports, Oct., pp. 4-10.
- O'Day, James
1970b "Drinking involvement in 1968 Michigan fatal accidents." HIT Lab Reports, pp. 7-10.
- O'Day, James
1974 "A proposed new national system for collecting multipurpose accident data: SIR." HIT Lab Reports, Vol. 4, No. 12, pp. 1-8.
- O'Neill, Brian O. and Eiswirth, Richard S.
1972 "Screening drivers for alcohol - an application of Bayes' formula." American Journal of Public Health, Vol. 62, No. 11, pp. 1468-1472.
- O'Neil, B. and Wells, W.T.
1971 "Blood alcohol level in drivers not involved in accidents and the lognormal distribution." Quarterly Journal of Studies on Alcohol, Vol. 32, pp. 798-803.
- Organization for Economic Co-operation and Development
1975 Young Driver Accidents. Paris, France: Organization for Economic Co-operation and Development.
- Paterson, C.A. and Jones, Trevor Owen
1972 "A mechanical device for preventing the drinking driver from starting a vehicle." pp. 498-512 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.
- Payne, C.E. and Selzer, M.L.
1962 "Traffic accidents, personality, and alcoholism: A preliminary study." Journal of Abdominal Surgery, Vol. 4, pp. 21-26.
- Pelz, Donald C.
1968 "Driver motivations and attitudes." pp. 101-122 in James O'Day, ed., Proceedings of the Second Annual Traffic Safety Research Symposium of the Automobile Insurance Industry, Washington, D.C.: Insurance Institute for Highway Safety.

- Pelz, D.C.
1973 Effects of Changes in Drinking, Hostility, and Alienation on Driving of Young Men. Paper prepared for International Conference on Driver Behavior, Zurich, October 9.
- Pelz, Donald C. and Krupat, Edward
1974 "Caution profile and driving record of undergraduate males." Accident Analysis and Prevention, Vol. 6, pp. 45-58.
- Pelz, Donald C.; McDole, T.L. and Schuman, S.H.
1975 "Drinking-Driving Behavior of Young Men in Relation to Accidents." Journal of Studies on Alcohol, Vol. 36, No. 7, pp. 956-972.
- Pelz, D. C. and Schuman, S.H.
1969 "Young drivers: Road behavior and motivations." in Proceedings from the Third Triennial Congress on Medical and Related Aspects of Motor Vehicle Accidents.
- Pelz, Donald C. and Schuman, Stanley H.
1971a Exposure Factors in Accidents and Violations of Young Drivers. Ann Arbor: Paper sponsored by the Highway Safety Research Institute, University of Michigan.
- Pelz, Donald C. and Schuman, Stanley H.
1971b Motivational Factors in Crashes and Violations of Young Drivers. Ann Arbor: Text of a speech presented at the meetings of the American Public Health Association, Oct. 13, 1971, Highway Safety Research Institute, University of Michigan, pubs.
- Pelz, Donald C. and Schuman, Stanely H.
1971c "Are young drivers really more dangerous after controlling for exposure and experience?" Journal of Safety Research, Vol. 3, pp. 68-79.
- Pelz, D.C. and Schuman, S.H.
1974 "Drinking, hostility, and alienation in driving of young men." pp. 50-74 in Proceedings of the Third Annual Alcoholism Conference, NIAAA.
- Pelz, Donald C. and Williams, Patricia A.
1975 Impulse Expression Through Cars, in Young Drivers. Ann Arbor: Paper sponsored by Highway Safety Research Institute, University of Michigan.
- Perrine, M.W.
1970a "Identification of personality, attitudinal, and biographical characteristics of drinking drivers." Behavior Research Highway Safety, Vol. 2, pp. 207-226.
- Perrine, M.W.
1970b "The spectrum of drinking drivers." pp. 29-74 in Alcohol and Highway Safety, Vol. 3 of the North Carolina Symposium on Highway Safety, Chapel Hill, N.C.: Highway Safety Research Center.
- Perrine, M.W.
1973 "Alcohol influences on driving-related behavior: A critical review of laboratory studies of neurophysiological, neuromuscular, and sensory activity." Journal of Safety Research, Vol. 5, No. 3, pp. 165-184.

Perrine, M.W.

1974 "Alcohol influences upon driving-related behavior: A critical review of laboratory studies of neuro-psychological, neuromuscular, and sensory activity." in Perrine ed., "Alcohol, Drugs and Driving," report prepared for the U.S. Dept. of Transportation, National Highway Traffic Safety Administration, Report No. DOT HS-801 196.

Perrine, M.W.

1975 "Alcohol involvement in highway crashes: A review of the epidemiologic evidence." Clinics in Plastic Surgery, Vol. 2, No. 1, January, pp. 11-34.

Perrine, M.W.; Waller, J.A. and Harris, L.S.

1971 Alcohol and Highway Safety: Behavioral and Medical Aspects. Final Report Project 14. University of Vermont, Burlington, Vermont. Project ABETS, D.O.T./N.H.T.S.A. Contracts No. FH-11-6609 and FH-11-6899.

Plymat, William N.

1972 Alcoholics, Social Drinkers, Youth, and the Alcohol-Traffic Problem in the United States. Des Moines, Iowa: Copy of a talk delivered to the International Congress for the Prevention of Alcohol and Drug Dependency in Kabul, Afghanistan, Aug. 29, 1972.

Pokorny, Alex D.; Smith, James P. and Finch, John R.

1972 "Vehicular suicides." Life-threatening Behavior, Vol. 2, No. 2, Summer, pp. 107-119.

Popham, R.E.

1956 "Alcoholism and traffic accidents: A preliminary study." Quarterly Journal of Studies on Alcohol, Vol. 17, pp. 225-232.

Rankin, J.G.

1967 "The effects of alcohol on driving efficiency." The Medical Journal of Australia, Vol. 54 (II), No. 16, pp. 718-721.

Raymond, A.E.

1972 "Characteristics of Breathalysed Drivers." Pp. 232-243 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.

Raymond, Anne and Birrell, J.H.W.

1971 "The drinking driver or the driving drinker?" Medical Journal of Australia, Vol. 2, No. 6, p. 339.

Robertson, J.S.

1972 "Blood alcohol concentrations in drivers breathalyzed by police in six Australian states." Pp. 206-218 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.

Robertson, Leon S.

1976 Whose Behavior in What Health Marketplace? Paper presented at the Steinhart Conference on "Consumer Behavior in the Health Marketplace." University of Nebraska, March 10, 1976.

Roizen, Ronald

1975 Drinking and Drinking Problems: Some Notes on the Ascription of Problems to Drinking. Berkeley, CA.: Paper presented at the Epidemiology Section meeting, 21st International Institute on the Prevention and Treatment of Alcoholism, Helsinki, Finland, June, 1975.

Room, Robin

1966 Notes on "Identifying Problem Drinkers in a Household Health Survey."
Berkeley, CA.: Mental Research Institute, Drinking Practices Study,
Working Paper No. 10.

Room, Robin

1968 Amount of Drinking and Alcoholism. Berkeley, CA.: Paper prepared
for presentation at the 28th International Congress on Alcohol and
Alcoholism, Washington, D.C., Sept. 1968.

Room, Robin

1975 The Measurement and Distribution of Drinking Patterns and Problems
in General Populations. Agenda Item 3.3 at the Meeting of Investigators
on Criteria for Identifying and Classifying Disabilities Related to Alcohol
Consumption, World Health Organization, Geneva, Switzerland, July 28,-
Aug. 1, 1975.

Room, Robin and Day, Nancy

1974 Alcohol and Mortality. Paper of the Social Research Group, School
of Public Health, University of California, Berkeley.

Rosenberg, N.; Laessig, R.H. and Rawlings, R.R.

1974 "Alcohol, age, and fatal traffic accidents." Quarterly Journal of
Studies on Alcohol, Vol. 35, pp. 473-489.

Rosenberg, Nathan; Goldberg, I.D. and Williams, G.W.

1972 "Alcoholism and drunken driving: Evidence from psychiatric and
driver registers." QJSA, Vol. 33, pp. 1129-1143.

Rosenblatt, Charles A.

1971 "Recognizing the drinking driver." HIT Lab Reports, May, pp. 1-4.

Rosenow, John H. and Watkins, Robert W.

1969 "Physician's role in highway safety." Police, Vol. 13, No. 6,
pp. 44-48.

Ross, H. Lawrence

1961 "Traffic Law Violation: A Folk Crime." Social Problems, 8:
pp. 231-241.

Ross, H. Lawrence

1974 "Britain's drinking-driving experience." Traffic Safety, Vol. 74
No. 7, pp. 8-11, 35-36.

Ross, H. Lawrence

1975 "The Scandinavian myth: The effectiveness of drinking and driving
legislation in Sweden and Norway." Journal of Legal Studies, Vol. 4,
No. 2, pp. 285-310.

Ross, H. Lawrence

1976 The Neutralization of Severe Penalties: Some Traffic Law Studies.
Paper presented at the 71st Annual Meeting of the American Sociological
Association, Sept. 3, 1976.

- Schlein, A.P. and Janes, J.M.
1969 "The intoxicated motor vehicle operator." pp. 143-147 in Proceedings from the Third Triennial Congress on Medical and Related Aspects of Motor Vehicle Accidents, Morton Grove, Illinois.
- Schmidt, C.W. Jr.; Shaffer, J.W.; Zlotowitz, H.T. and Fisher, R.S.
1976 "Personality factors in crashes: Age and alcohol." pp. 307-313 in D. Huelke ed., Proceedings of the 20th Conference of the American Association for Automotive Medicine -- Atlanta, Ga., Nov. 1-3, 1976, Morton Grove, Ill.: American Association for Automotive Medicine.
- Schmidt, C.W.; Perlín, S.; Dizman, P.B.; Fisher, R.S. and Shaffer, J.W.
1970 Driver Fatalities in Single Car Accidents. Unpublished Article.
- Schmidt, Chester W.; Perlín, Seymour; Townes, Wayne; Fisher, Russel and Shaffer, John W.
1972 "Characteristics of drivers involved in single-car accidents." Archives of General Psychiatry, Vol. 27, No. 6, pp. 800-803.
- Schmidt, Wolfgang and de Lint, Jan
1972 "Causes of death of alcoholics." Quarterly Journal of Studies on Alcohol, Vol. 33, No. 1, pp. 171-185.
- Schmidt, Wolfgang and Popham, Robert E.
1975 "Heavy alcohol consumption and physical health problems: A review of the epidemiological evidence." Drug and Alcohol Dependence, Vol. 1, pp. 27-50.
- Schmidt, W. and Smart, R.G.
1959 "Alcoholics, drinking and traffic accidents." QJSA, Vol. 20, pp. 631-644.
- Schmidt, W. and Smart, R.G.
1963 "Drinking-driving mortality and morbidity statistics." Chapter 2 in B. Fox and J. Fox, eds., Alcohol and Traffic Safety, Washington, D.C.: U.S. Government Printing Office.
- Schmidt, W.; Smart, R.G. and Popham, R.E.
1962 "The role of alcoholism in motor vehicle accidents." Traffic Safety Research Review, Vol. 6, pp. 21-27.
- Schneider, Richard W.
1975 "The analysis of accident data using the 'case-by-case matching' technique." pp. 292-300 in D. Huelke, ed., Proceedings of the 19th Conference of the American Association for Automotive Medicine, San Diego, CA, November 20-22.
- Schuman, Stanley H. and Pelz, Donald C.
1972 "Host factors in dangerous driving: Evidence for the design of countermeasure programs." California Medicine, Vol. 116, No. 2, pp. 5-9.
- Schuman, S.H.; Pelz, D.C.; Ehrlich, N.J. and Selzer, M.L.
1967 "Young male drivers. Impulse expression, accidents and violations." Journal of the American Medical Association, Vol. 200, No. 12, pp. 102-106.
- Scofield, Debra L.
1976 Public Policy and Alcohol Consumption in the Maritime Provinces. Halifax, Nova Scotia: Internal paper ERD-76-67 of the Atlantic Provinces Economic Council.

Sergeant, J.C.

1975 "California pedestrian accidents." pp. 136-148 in D. Huelke ed., Proceedings of the 19th Conference of the American Association for Automotive Medicine, San Diego, CA, November 20-22, 1975.

Selzer, M.L.

1961 "Personality versus intoxication as critical factor in accidents caused by alcoholic drivers." Journal of Nervous Mental Disorders, Vol. 132, pp. 298-303.

Selzer, M.L.

1969a "Alcoholism, Mental Illness and Stress in 96 Drivers Causing Fatal Accidents." Behavioral Science, Vol. 14, pp. 1-10.

Selzer, M.L.

1969b "Alcoholics at fault in fatal accidents and hospitalized alcoholics; A comparison." Journal of Studies on Alcohol, Vol. 30, No. 4, December pp. 883-887.

Selzer, M.L.

1975 "Alcoholics and social drinkers: Characteristics and differentiation." pp. 13-20 in Israelstam and Lambert eds., Alcohol, Drugs and Traffic Safety, Toronto, Canada: Addiction Research Foundation of Ontario.

Selzer, M.L., Payne, C.E.; Gifford, J.D. and Kelley, W.L.

1963 "Alcoholism, mental illness and the 'drunk driver'." American Journal of Psychiatry, Vol. 120, pp. 326-331.

Selzer, M.L.; Payne, C.E.; Quinn, J. and Westervelt, F.H.

1966 "A depression-aggression syndrome related to accidents caused by alcoholic drivers." Pp. 297-303 in Alcohol and Traffic Safety, Proceedings of the 4th International Conference on Alcohol and Traffic Safety, Bloomington, Indiana: Indiana University.

Selzer, Melvin L.; Payne, Charles E.; Westervelt, Franklin H. and Quinn, James

1967 "Automobile accidents as an expression of psychopathology in an alcoholic population." QJSA, Vol. 28, pp. 505-516.

Selzer, M.L.; Rogers, J.E. and Kern, S.

1968 "Fatal accidents: The role of psychopathology, social stress, and acute disturbance." American Journal of Psychiatry, Vol. 124, pp. 1028-1036.

Selzer, M.; Vanosdall, F.E. and Chapman, M.

1971 "Alcoholism in a problem driver group: A field trial of the Michigan Alcoholism Screening Test." Journal of Safety Research, Vol. 3, No. 4, pp. 176-180.

Selzer, M.L. and Vinokur, A.

1974 "Life events, subjective stress, and traffic accidents." American Journal of Psychiatry, Vol. 131, No. 8, pp. 903-906.

Selzer, M.L. and Vinokur, A.

1975 "Driving and psychosocial characteristics of drunk drivers." pp. 144-252 in D. Huelke ed., Proceedings of the 19th Conference of the American Association of Automotive Medicine, San Diego, CA, November 20-22, 1975.

- Selzer, M.L. and Weiss, S.
1966 "Alcoholism and traffic fatalities: Study in futility." American Journal of Psychiatry, Vol. 122(4), January, pp. 762-767.
- Senseman, Lawrence A.
1973 "Alcohol and traffic safety: Measures required to awaken apathetic public to the critical problem." Rhode Island Medical Journal, Vol. 56, No. 4, pp. 158-159, 167.
- Shafer, Ronald G.
1968 "Alcoholics and accidents." Science Digest, Vol. 64, No. 5, pp. 38-42.
- Sevitt, S.
1973 "Fatal road accidents in Birmingham: Times to death and causes." Injury, Vol. 4, No. 4, pp. 281-293.
- Shaffer, John W.; Towns, Wayne; Schmidt, Chester W., Jr.; Fisher, Russel S. and Zlotowitz, Howard I.
1974 "Social adjustment profiles of fatally injured drivers." Archives of General Psychiatry, Vol. 30, April, pp. 508-511.
- Shapiro, H.A.
1970 "Alcohol and the holocaust on our roads." Journal of Forensic Medicine, Vol. 17, No. 1, pp. 1-4.
- Signori, Edro I. and Bowman, Roland G.
1974 "On the study of personality factors in research on driving behavior." Perceptual and Motor Skills, Vol. 38, No. 3, pp. 1067-1076.
- Simson, R.E. and Watters, R.B.
1972 Some Aspects of Breath Analysis Experienced in New South Wales, Australia - The Provision of an Alcohol Screening Test For Drivers. Paper presented at the 30th Annual International Congress on Alcoholism and Drug Abuse, Amsterdam, Sept. 1972.
- Smart, R.G.
1966 "Personality and Drinking History Variables Associated with High Accident Rates among Alcoholics." Pp. 99-102 in Alcohol and Traffic Safety, Proceedings of the 4th International Conference on Alcohol and Traffic Safety, Bloomington, Indiana: Indiana University.
- Smart, Reginald G.
1969a "Alcohol and motor vehicle accidents." pp. 127-129 in Proceedings from 3rd Triennial Congress on Medical and Related Aspects of Motor Vehicle Accidents.
- Smart, Reginald G.
1969b "Are alcoholics' accidents due solely to heavy drinking?" Journal of Safety Research, Vol. 1, No. 4, December, pp. 170-173.
- Smart, Reginald G.
1976 "Per capita alcohol consumption, liver cirrhosis death rates, and drinking and driving." Journal of Safety Research, Vol. 8, No. 3, pp. 112-115.

- Smart, R.G. and Schmidt, W.
1967 "Responsibility, blood alcohol levels and alcoholism." Traffic Safety Research Review, Vol. 11, No. 4, pp. 112-116.
- Smart, R.G. and Schmidt, W.
1969 "Physiological impairment and personality factors in traffic accidents of alcoholics." QJSA, Vol. 30, pp. 440-445.
- Smart, R.G. and Schmidt, Wolfgang
1970 "Blood alcohol levels in drivers not involved in accidents." QJSA, Vol. 31, pp. 968-971.
- Smith, G.; Davidson, M. and Wolynetz, M.
1975 "Estimated Blood Alcohol Concentrations of Nighttime Canadian Drivers." Report from the Road Safety Division of the Canadian Dept. of Transportation.
- Smith, Grant; Wolynetz, Mark and Davidson, Mark
1975 "Estimated Blood Alcohol Concentrations of Nighttime Canadian Drivers." Technical Memorandum TMHS 7503 of Canadian National Roadside Survey, Transport Canada, Road Safety.
- Smith, H. and Popham, R.
1951 "Blood alcohol levels in relation to driving." Canadian Medical Association Journal, Vol. 65, pp. 325-328.
- Solheim, Kaare
1964 "Pedestrian deaths in Oslo traffic accidents." British Medical Journal, Vol. 1, pp. 81-83.
- Sterling-Smith, Robert S.
1976 "A Special Study of Drivers Most Responsible In Fatal Accidents. Summary for Management." Office of Statistics and Analysis, U.S. Dept. of Transportation, Contract #DOT - HS-310-3-595.
- Stevenson, Gordon McKay, Jr.
1972 "The emergence of non-skid-row alcoholism as a 'public' problem." Temple Law Quarterly. Vol. 45, No. 4, pp. 529-589.
- Stinchcombe, Arthur L.
1975 "A Parsonian theory of traffic accidents." Sociological Inquiry, Vol. 45, No. 1, pp. 27-30.
- St. Louis Globe-Democrat
1969 "Alcohol and Highway Safety." Reprint of Six-Article Series Written and Published by St. Louis Globe-Democrat, October 18 - 24.
- Stroh, Carl M.
1974 Alcohol and Highway Safety: A Review of the Literature and a Recommended Methodology. (Pamphlet) Canada: Ministry of Transport.
- Tamerin, John S.; Weiner, Sheldon and Mendelson, Jack H.
1970 "Alcoholics' expectancies and recall of experiences during intoxication." American Journal of Psychiatry, Vol. 126, No. 12, pp. 39-46.

- Tennet, R.B.
1969 "Death on the highway: An analysis of 100 road accidents in a rural area." New Zealand Medical Journal, Vol. 70, No. 448, pp. 159-161.
- Tonge, J.I.
1972 "Post-mortem blood alcohol levels in road accident victims." Pp. 201-205 in Papers Presented at the National Road Safety Symposium, Canberra, Australia: Australian Government Publishing Service.
- Traffic Injury Research Foundation of Canada
1975 Analysis of Fatal Traffic Crashes in Canada 1973; Focus: The Impaired Driver. (Pamphlet) Ottawa, Ontario: Traffic Injury Research Foundation of Canada.
- Transportation, Department of
1968 "1968 Alcohol and highway safety report." A study transmitted by the Secretary of the Department of Transportation to the Congress, August, 1968, Washington, D.C.: U.S. Government Printing Office.
- Turk, R.F.; McBay, A. and Hudson, P.
1974 "Drug involvement in automobile driver and pedestrian fatalities." Journal of Forensic Sciences, Vol. 19, No. 1, pp. 90-97.
- Vamosi, M.
1963 "Experiences with non-alcoholic road traffic in Czechoslovakia." pp. 79-82 in Alcohol and Road Traffic, Proceedings of the Third International Conference on Alcohol and Road Traffic, Tavistock Square, London: B.M.A. House.
- Van Duzer, W.A.
1934 "Motor vehicle accidents as reflected by psychological tests and reaction meters." pp. 348-351 in Proceedings of 13th Annual Meeting of Highway Research Board, Washington, D.C.: National Research Council.
- Van Oyen, D.
1972 Recidivism in Drunken Driving. Paper presented at the 30th International Congress on Alcoholism and Drug Dependence, Amsterdam, 1972.
- Voas, R.B.
1973 "Alcohol as an underlying factor in behavior leading to fatal highway crashes." pp. 324-331 in Morris E. Chafetz ed., Proceedings of the First Annual Alcoholism Conference of the NIAAA, Washington, D.C.: U.S.G.P.O.
- Voas, Robert B.
1975 "Roadside surveys, demographics and BACs of drivers." pp. 21-31 in Israelstam and Lambert eds., Alcohol, Drugs and Traffic Safety, Toronto: Addiction Research Foundation of Ontario.
- Wagner, M.H.; Bigelow, J.H.; Cobb, J.; Goldstein, L. and Kirkpatrick, R.E.
1975 "Analysis of High Risk Groups For Alcohol Countermeasures; Phase I: High Risk Driver Study Plan Report." Prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, report number DOT-HS-801 433.
- Waller, J.A.
1965 "Chronic medical conditions and traffic safety: A review of the California experience." New England Journal of Medicine, Vol. 273, pp. 1413-1420.
- Waller, J.A.
1966a "High 'accident' risk among middle-aged drivers and pedestrians." Geriatrics, Vol. 21, No. 12, pp. 125-137.

Waller, J.A.

1966b "Use and misuse of alcoholic beverages as factor in motor vehicle accidents." Public Health Reports, Washington, D.C., Vol. 81, pp. 591-597.

Waller, J.A.

1966c "Alcohol and traffic accidents: Can the gordian knot be broken?" Traffic Safety Research Review, Vol. 10, March, pp. 14-21.

Waller, J.A.

1967 "Identification of problem drinking among drunken drivers." Journal of the American Medical Association, Vol. 200, pp. 114-120.

Waller, Julian A.

1967 "Drinking drivers and driving drinkers - The need for multiple approaches to accidents involving alcohol." in Selzer, Gikus, and Huelke eds., The Prevention of Highway Injury, Ann Arbor, Michigan: Highway Safety Research Institute.

Waller, J.A.

1968a "Holiday drinking and highway fatalities." Journal of the American Medical Association, Vol. 206, No. 12, pp. 2693-2697.

Waller, J.A.

1968b "Patterns of traffic accidents and violations related to drinking and to some medical conditions." QJSA, Suppl. No. 4, pp. 118-137.

Waller, Julian A.

1968c "The role of alcohol in fatal collisions with trains." Northwest Medicine, Vol. 67, pp. 852-856.

Waller, Julian A.

1969a "Why we're missing the boat on alcohol education." Traffic Safety, Vol. 69, No. 2, pp. 25, 36.

Waller, Julian A.

1969b "Impaired driving and alcoholism: Personality or pharmacologic effect?" Journal of Safety Research, Vol. 1, No. 4, December, pp. 174-178.

Waller, J.A.

1970 "The role of alcohol in collisions involving trucks." Archives of Environmental Health, Vol. 20, February, pp. 254-258.

Waller, J.A.

1971 "Factors associated with police evaluation of drinking in fatal highway crashes." Journal of Safety Research, Vol. 3, No. 1, pp. 35-41.

Waller, Julian A.

1973 "Determining Strategies and Expectations Regarding Increased Enforcement Against Alcohol Impaired Driving in Rural Areas." Report III-111 of Project CRASH (Countermeasures Related to Alcohol Safety on the Highways), Vermont Dept. of Mental Health, National Highway Traffic Safety Administration, U.S. Dept. of Transportation, Contract No. FH-11-7543.

- Waller, Julian A.
1975 "Epidemiologic issues about alcohol, other drugs and highway safety." pp. 3-11 in Israelstam and Lambert eds., Alcohol, Drugs, and Traffic Safety, Toronto: Addiction Research Foundation of Ontario.
- Waller, Julian A. and Goo, James T.
1969 "Highway crash and citation patterns and chronic medical conditions." Journal of Safety Research, Vol. 1, No. 1, pp. 13-27.
- Waller, J.A.; King, E.M.; Nielson, G and Turkel, H.W.
1969 "Alcohol and other factors in California highway fatalities." Journal of Forensic Science, Vol. 14, No. 4, pp. 429-444.
- Waller, Julian A.; Lamborn, Kathleen R. and Steffenhagan, Ronald A.
1974 "Marihuana and driving among teenagers: Reported use patterns, effects and experiences related to driving." Accident Analysis and Prevention, Vol. 6, pp. 141-161.
- Waller, Julian, A.; Thomas, Kenneth; Harris, Lawrence S. and Whorton, Elbert B.
1971 Carbon Monoxide, Smoking, and Fatal Highway Crashes. Modified version of paper presented at Fifteenth Conference of the American Association for Automotive Medicine, Oct. 21, 1971.
- Waller, J.A. and Turkel, H.W.
1966 "Alcoholism and traffic deaths." New England Journal of Medicine, Vol. 275, pp. 532-536.
- Waller, Julian A. and Whorton, Elbert B.
1973 "Unintentional shootings, highway crashes and acts of violence - a behavior paradigm." Accident Analysis and Prevention, Vol. 5, pp. 351-356.
- Warren, Carol A.B. and Phillips, Stephen W.
1976 "Stigma negotiation: Expression games, accounts and the drunken driver." Urban Life, Vol. 5, No. 1, pp. 53-74.
- Wayne, E.J.
1963 "Alcohol and driving -- The pharmacological background." Pp. 113-118 in Alcohol and Road Traffic, Proceedings of the Third International Conference on Alcohol and Road Traffic, Tavistock Square, London: British Medical Association, B.M.A. House.
- Wechsler, Henry; Kasey, E.H.; Thum, D. and Demone, H.W.
1969 "Alcohol level and home accidents." Public Health Reports, Vol. 84, pp. 1043-1050.
- Weckworth, V.
1975 "Telephone Survey for Hennepin County ASAP." Report to D.O.T., N.H.T.S.A., and Department of Public Safety, State of Minnesota.
- White, S.B. and Clayton, C.A.
1972 "Some effects of alcohol, age of driver, and estimated speed on the likelihood of driver injury." Accident Analysis and Prevention, Vol. 4, pp. 59-66.
- Whitehead, Paul C.
1975 Epidemiology of Drug-Related Problems in Canada, 1975. Paper from Workshop Proceedings, Non-Medical Use of Drugs Directorate, Health and Welfare, Canada.

Whitehead, P.C.

1976 "Collision behavior of young drivers: A response to Zylman." Journal of Studies on Alcohol, Vol. 37, No. 3, pp. 402-408.

Whitehead, P.C.; Craig, J.; Ferrence, R.G.; Longford, N. MacArthur, C. and Stanton, B.

1975 "Collision behavior of young drivers; Impact of the change in the age of majority." Journal of Studies on Alcohol, Vol. 36, No. 9, pp. 1208-1222.

Whitehead, P.C. and Ferrence, R.G.

1976 "Alcohol and other drugs related to young drivers' traffic accident involvement." Journal of Safety Research, Vol. 8, No. 2, pp. 65-72.

Whitlock, F.A.

1971 "The drinking driver or the driving drinker? Alcohol, alcoholism, and other factors in road accidents." The Medical Journal of Australia, Vol. 2, No. 1, pp. 5-16.

Williams, A.G.; Rich, R.G.; Robertson, L.S. and Zador, P.L.

1975 "The legal minimum drinking age and fatal motor vehicle crashes." The Journal of Legal Studies, Vol. 4, No. 1, pp. 219-239.

Wilson, K.E.

1970 "Involvement of alcohol in fatal motor vehicle crashes." pp 240-243 in Arthur H. Keeney ed., Proceedings of the 11th Annual Meeting of the American Association for Automotive Medicine, Springfield, Illinois: Charles C. Thomas Publishing, Co.

Wolfe, A.

1974 "U.S. national roadside breathtesting survey." HIT Lab Reports, Vol. 4, No. 11, pp. 1-16.

Wolfe, A.C.

1975 Characteristics of Alcohol-Impaired Drivers. (Pamphlet) Warrendale, Pa.: Society of Automotive Engineers.

Wolfe, Arthur C. and Chapman, Marion M.

1972 "High school student drinking and driving behavior." HIT Lab Reports, June, pp. 6-13.

Woodhouse, E.J.

1974 "The Incidence of Drugs in Fatally Injured Drivers." Final Report to U.S. Dept. of Transportation, Contract #DOT HS 119-1-627.

Wooler, J.

1968 "Road traffic accidents in Adelaide and Brisbane, Australia -- Excerpts from a report in preparation." Pp. 976-994 in Australian Road Research Board Proceedings -- 4th Conference, Melbourne; Ramsay, Ware Publishing Pty. Ltd.

Yoder, R.D.

1975 "Prearrest behavior of persons convicted of driving while intoxicated." QJSA, Vol. 36, No. 11, pp. 1573-1577.

Yoder, Richard D. and Moore, Robert A.

1973 "Characteristics of convicted drunken drivers." QJSA, Vol. 34, pp. 927-936.

- Zung, Burton J. and Charalampous, K.D.
1975 "Item analysis of the Michigan Alcoholism Screening Test." Journal of Studies on Alcohol, Vol. 36, No. 1, pp. 127-132.
- Zylman, R.
1968 "Accidents, alcohol and single-cause explanations; Lessons from the Grand Rapids Study." QJSA, Suppl. No. 4, pp. 212-233.
- Zylman, R.
1970 "Are drinking-driving laws enforced?" The Police Chief, Vol. 37, No. 9, pp. 48-51.
- Zylman, R.
1971a "Analysis of studies comparing collision-involved drivers and non-involved drivers." Journal of Safety Research, Vol. 3, No. 3, pp. 116-128.
- Zylman, Richard
1971b "Correspondence: The blood alcohol distribution in drivers not involved in accidents." QJSA, Vol. 32, pp. 188-190.
- Zylman, Richard
1971c "The alcohol-highway safety countermeasures program: A panacea or Pandora's Box?" Traffic Digest and Review, Vol. 19, No. 4, pp. 16-24.
- Zylman, Richard
1972a "Age is more important than alcohol in the collision-involvement of young and old drivers." Journal of Traffic Safety Education, Vol. 20 No. 2, pp. 7-8.
- Zylman, Richard
1972b "Race and social status discrimination and police action in alcohol-affected collisions." Journal of Safety Research, Vol. 4, No.2, pp. 75-84.
- Zylman, Richard
1972c "Drivers records: Are they a valid measure of driving behavior?" Accident Analysis and Prevention, Vol. 4, pp. 333-349.
- Zylman, R.
1973 "Youth, alcohol, and collision involvement." Journal of Safety Research, Vol. 5, No. 2, pp. 58-72.
- Zylman, Ricahrd
1974a "A critical evaluation of the literature on 'alcohol involvement' in highway deaths." Accid. Anal. & Prev. Vol. 6, pp. 163-204.
- Zylman, Richard
1974b "Drinking and driving after it's legal to drink at 18." The Police Chief, Vol. 41, No. 11, pp. 18-21.
- Zylman, Richard
1974c "Fatal crashes among Michigan youth following reduction of legal drinking age." QJSA, Vol. 35, pp. 283-286.

Zylman, Richard

1974d "Teenagers and alcohol." American Association for Automotive Medicine, Quarterly, 1 March, pp. 26-27.

Zylman, Richard

1974e "When it became legal to drink at 18 in Michigan: What happened?" Journal of Traffic Safety Education, Vol. 21, No. 3, pp. 15-16, 38.

Zylman, Richard

1974f "Overemphasis on alcohol may be costing lives." Police Chief, Vol. 41, No. 1, pp. 64-67.

Zylman, Richard

1975 "DWI enforcement programs: Why are they not more effective?" Accident Analysis and Prevention, Vol. 7, No. 3 pp. 179-190.

Zylman, R.

1976a "Drinking practices among youth are changing regardless of legal drinking age." Journal of Traffic Safety Education, Vol. XXIV, No. 1, pp. 31-37.

Zylman, Richard

1976b "All alcoholics are high risk drivers: A myth." Journal of Traffic Safety Education, Vol. 23, No. 2, pp. 7-10.

Zylman, Richard

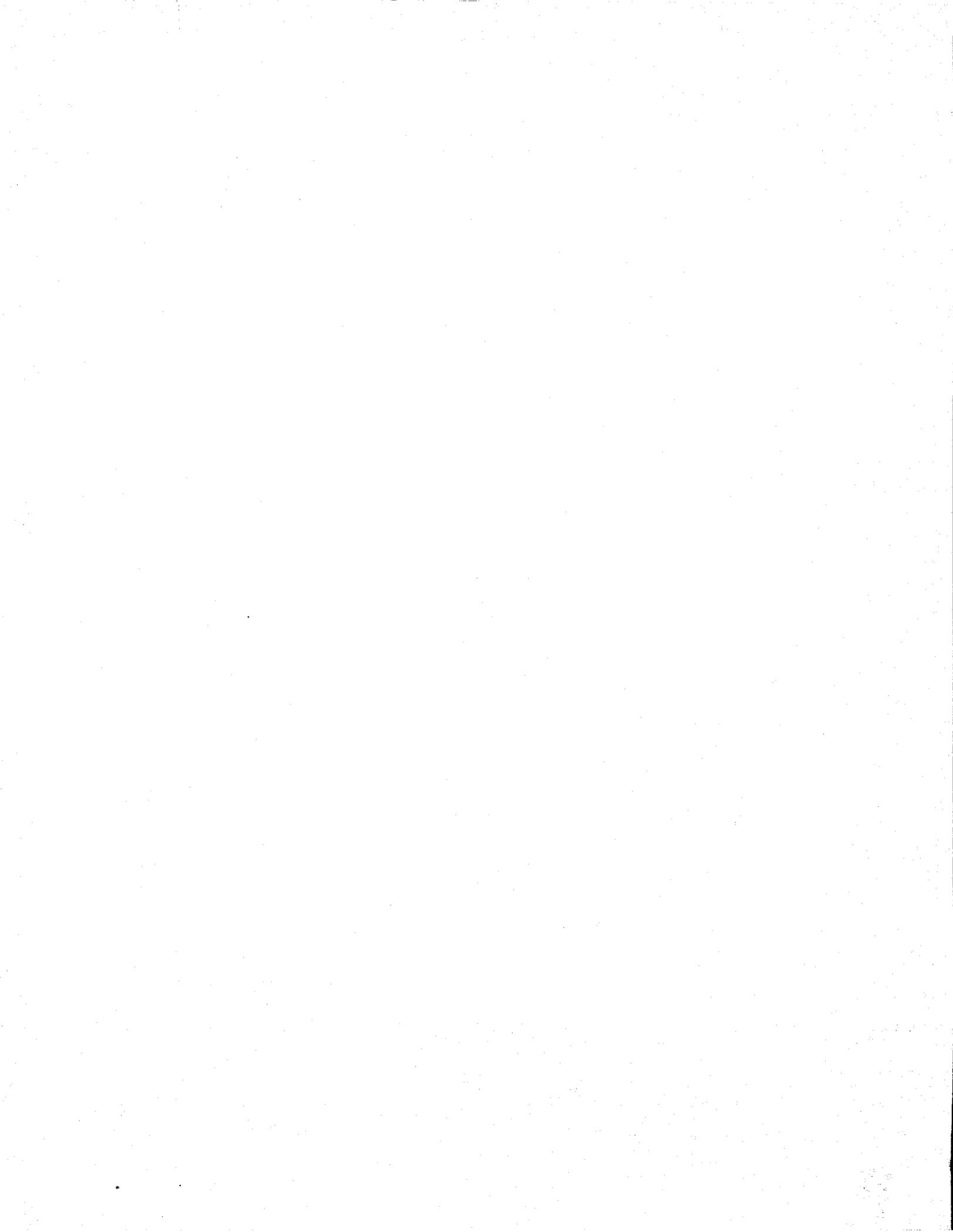
1976c "Collision behavior of young drivers: Comment on the study of Whitehead et al." Journal of Studies on Alcohol, Vol 37, No. 3, pp. 393-401.

Zylman, Richard

1976d "Hostile drivers and alcohol don't mix." Trial, Vol. 12, No. 10, pp. 60-62.

Zylman, R. and Bacon, S.

1968 "Police records and accidents involving alcohol." QJSA, Suppl. No. 4, pp. 178-211.



CHAPTER FOUR

ALCOHOL AND CRIME

by

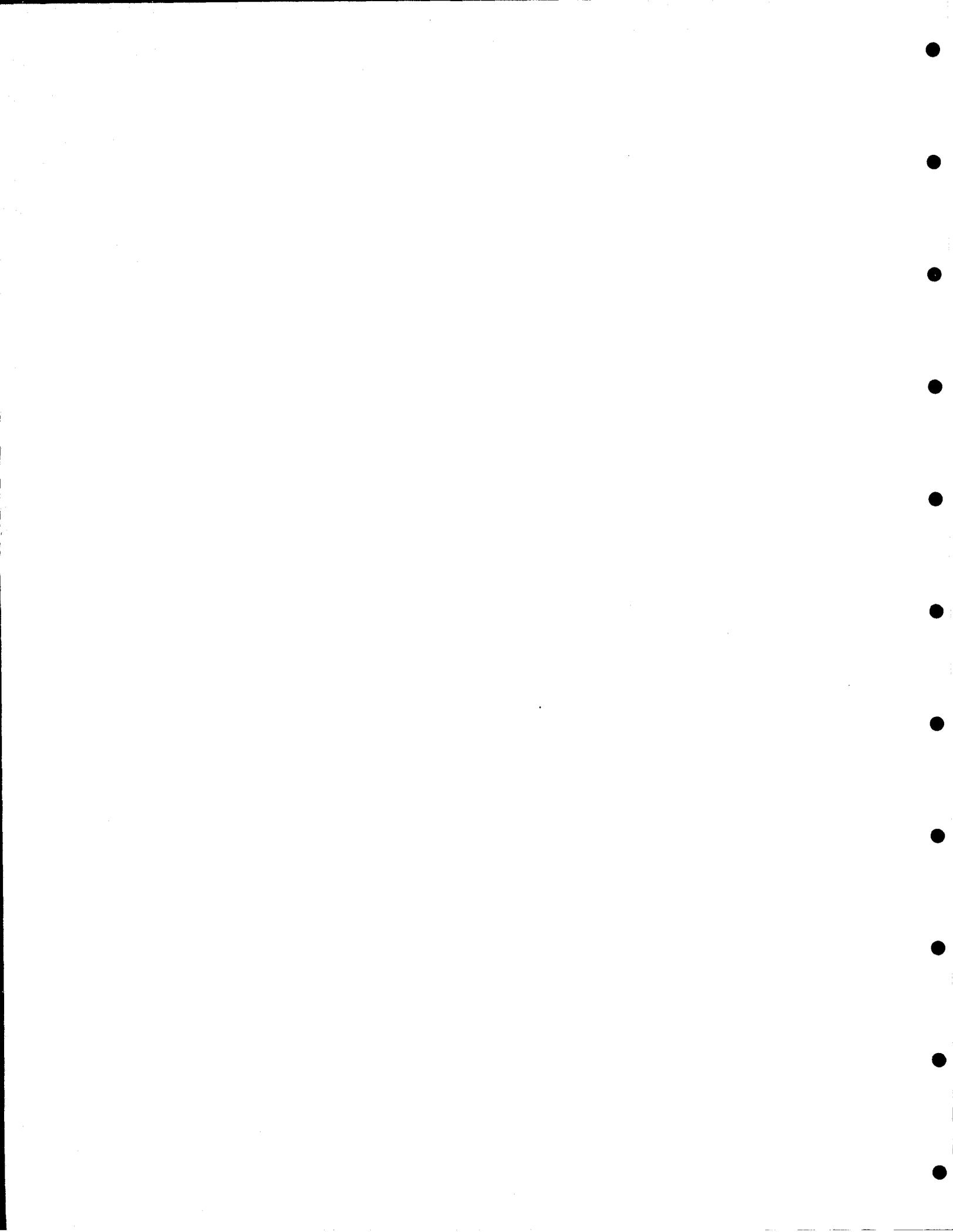
Judy Roizen

Dan Schneberk

TABLE OF CONTENTS

	<u>Page</u>
Introduction	292
I. Overview of Research on Alcohol and Crime	302
II. Methodological and Reporting Problems In Research on Alcohol and Crime	307
A. Underreporting	307
B. Clearance	308
C. Inequity	313
D. Methodological Constraints on Measurement of Drinking Involvement	317
III. Contemporary Empirical Research on Alcohol and Crime	320
A. Alcohol in the Criminal Event	322
1. Robbery	322
2. Rape	340
3. Assaults	346
4. Homicide	352
B. Alcohol in Criminal Events -- Prison Studies	365
C. Drinking History and Drinking Problems -- Prison Studies	378
D. Criminal Careers of Labelled Alcoholics	395
IV. Alcohol and Crime: Variation in the Perceived Relationship	401
Footnotes	417
Bibliography	422

This paper was very much a product of the Casualty Study Project. Our thanks to all, but especially to Arba Goode, John Milkes and Lena Johnson.



Introduction

The attribution of a wide range of social problems--including crime--to alcohol has a long social history. A select committee of the English House of Parliament as early as 1834 concluded:

"among the evils distinctly traceable to traffic intoxicants, the spread of crime in every shape and form . . . (causing) an enormous mass of human beings who under sober habits and moral training, would be sources of wealth and strength to the country, (to be) transformed, chiefly through the remote or immediate influence of intoxicating drinks, into (beings) of corruption and weakness which must be cut off and cast away from the community."¹

The relationship between crime and drinking has been the subject of social research for nearly a century. This research is the subject of this chapter.

The number and kinds of crimes committed during or after drinking are events for which there are limited estimates, at best. Whether it is disinhibition of moral constraints, decremental changes in judgement, mood or motor coordination that is suggested by the phrase "under the influence of alcohol" is an open question. Even so simple a question as how to estimate the number of alcohol involved crimes is a question that provokes dispute. That some kinds of criminal activity are partially or wholly a function of, or exacerbated by, the presence of alcohol in the situation is not disputed here. What is an issue is determining the amount and kind of criminal behavior that is a tangible consequence of drinking alcoholic beverages, and determining the putative relationship of drinking and criminal behavior.² The data for this report are the various social surveys, administrative reports, and experiments that, over a period of 100 years, have argued the relationship between alcohol and crime.

For the most part research on alcohol and crime has involved little more than providing a basis for one-number estimates of drinking or drunkenness

during the commission of a particular crime--usually a violent crime. Different historical periods have had differing one-number estimates of alcohol's contribution to the crime problems. The size of these estimates has depended upon which aspect of alcohol (e.g. drinking vs. drunkenness) was seen as responsible for criminal behavior; which alcohol theory was the organizing framework for data; and whether the purpose of estimation was to enhance or explain the problem. A number of factors, however, make measuring the prevalence and role of drinking in criminal events problematic. One factor is the variety of criminal events; another is the complex part alcohol plays in these events; and a third is the failure to distinguish the several questions subsumed under the general question of the relationship between drinking and crime.

Crime is made up of a variety of discrete, serious events. Most research on the relationship between drinking and crime has failed to acknowledge the difficulty in delimiting and defining criminal events, as well as defining the diverse roles alcohol can play in these events. Alcohol can be involved in forming intent for a crime, in aggravating the course of a criminal event once it has begun (e.g., by excess violence) or it can affect the outcome of crime already completed. Different aspects of alcohol (e.g., BAC, alcoholism, drunkenness) can be claimed responsible for criminal events; as can different effects of alcohol (e.g., loss of concentration, drunkenness, sensorimotor incapacity). Alcohol can play a causal role in the event or simply be present without effect.

The general relationship of alcohol and crime can be unpacked into the following questions:

1. What are the tangible effects of drinking in causing criminal events?
2. What are the drinking problems of criminal offenders?

3. What are the crime problems of labelled alcoholics?

In most historical periods one or another of these questions has been more or less important in determining the social consequences of drinking. In the late nineteenth century these questions were treated as single indicators of a crime and alcohol "problem". Contemporary research on alcohol and crime bears on all these questions but often little attempt is made to specify the differences among them. Whether drinking is viewed as a factor in the criminal event or a chronic condition of criminal actors is often either unspecified or both characterizations of alcohol's role are conjoined.

This review presents alcohol findings from a wide range of studies in both the alcohol and criminological literature. The relationships are presented in a critical light to demonstrate, at once, the paucity of well gathered data, the diversity of roles drinking can play, and the wide variety of disparate evidence which has been brought to bear on the alcohol/crime relationship.

Although there is no simple formula to be used in estimating the proportion of crimes to which drinking has contributed there is value in reviewing the empirical data on the alcohol/crime relationship in a single monograph. Past articles and reviews have combined a variety of kinds of data without serious attention to measurement error, the limited relationship of theory to data, or the limited theoretical specificity inherent in most work on the relationship between alcohol and crime. It is hoped that a longer more comprehensive review will remedy some of this.

The variation displayed in Charts I, II, and III (Chapter I) is the variation which this report seeks to explain. Clearly these charts demonstrate that there is no single measure of alcohol's role in or responsibility for criminal events. The variation in estimates of alcohol involvement stems from several factors: the lack of agreement in these literatures on an alcohol variable; differential attention to alcohol from civil jurisdiction to jurisdiction; unrepresentative samples of criminal offenders; variable definitions of the casualty itself; the failure of theory to provide an orientation to measurement of the alcohol variable.

These charts do show the presence of alcohol or alcohol problems in a substantial proportion of studies of each type. However, as Bard and Zacker point out, "alcohol is an extraordinarily common social lubricant in this country -- so common that many, if not most, social occasions are marked by its use. It would not be unreasonable to expect then that (these crimes) . . . homicide and assault which mostly occur between intimates and in a social context . . . would show evidence of alcohol use."⁴ The problem, then, is to differentiate alcohol-present situations from those where alcohol is involved in fact or in perception.

Alcohol as a Causal Locus

Attributing criminal events to alcohol means moving beyond associational research to criteria that distinguish alcohol-present events from events in which alcohol plays a contributory or "causal" role. Without doubt popular culture attributes crime to alcohol.³ Empirical research is left the task of testing the merit of this putative relationship. A number of factors point to the special difficulty of reconciling disparate pieces of empirical evidence on the alcohol/crime relationship:

1) The discrepancy between the proportion of events which show the presence of alcohol and the proportion of events which offenders believe to be alcohol related.

2) The potential for disagreement between diverse actors in attributing responsibility for criminal behavior to alcohol.

3) The potential for drunkenness claims to be used to mitigate responsibility for deviant acts.

Few studies in the casualty and crime literature ask victims or offenders for their perceptions of the role of alcohol in the crime event. A recent study by Mayfield is an exception to this. Fifty-eight percent of the prison offenders, who were the subject of this study, reported drinking at the time of the event. Of this fifty-eight percent, forty-eight percent stated that their drinking contributed to or "caused" the crime. Thus alcohol was present in twice the number of events that the offender believed to be alcohol-involved. Problem drinkers (who were intoxicated at the time of the crime) were less likely to see drinking as "irrelevant" to the commission of the crime; but even among problem drinkers over a third (36%) felt drinking was irrelevant.

Another source of difficulty in attributing crimes to alcohol stems from the varying perceptions of different actors in criminal events. A recent study of marital violence (Bard and Zacker, 1974) demonstrates the differences in the perceptions of the presence and role of alcohol made by different actors in the same event. This study compares alcohol involvement as perceived by the complaining party in a criminal event, the non-complaining party and the police-marital-relations officer answering the call. In the officer's view the complainant was noted as having used alcohol (but not necessarily as having been drunk) in 26% of the cases. The person against whom the complaint was made was reported by officers to have been drinking in 30% of the cases. Alcohol, however, was perceived "to be primary in the

origins of disputes" in only 14% of the cases. Further, 10% of the cases were alleged to have a drunken offender by the complainant but fewer than half of these could be corroborated by the police. It is noteworthy, too, that of the cases in which the officers thought that an assault had taken place, it was perceived by the police that the non-complaining party had been drinking in 21% of the cases, while the proportion was 40% for non-assaultive cases.

Although the presence of the police may, itself, have a sobering effect, these data suggest that the parties in a criminal event perceive the involvement of alcohol differently. Victims may "use" a claim of drunkenness on the part of the offender to get relief in a situation in which they feel powerless. The police may be reluctant to label a crime alcohol-involved for fear of mitigating an offender's responsibility. Offenders' reports may be subject to bias of various sorts.

The self-reported presence of alcohol in crime events has long been perceived as questionable. Aschaffenburg noted at the turn of the century that although the relation "between crime and intoxication may seem quite comprehensible, it is nevertheless unfortunate that the criminal cannot be relied upon. According to his circumstances he will endeavor to exaggerate or conceal the degree of intoxication." Although the degree to which alcohol is used to mitigate responsibility is questionable (Roizen, 1977) there is data which suggests that it does happen. McCaghy (1968) argues that drinking claims permit a child molester to admit deviant behavior without taking responsibility for that behavior. With this in mind it is likely that drinking claims are "managed" by some offenders so as to mitigate responsibility. Thus, when the measurement of the alcohol variable relies on the offender's self-report, the offenders' perception of the contributory role of alcohol in the event must be measured against that perceived by the victim, witnesses

and arresting officers.

The failure of much data on drinking and crime to conform to the expected predictive consequence of alcohol specific theories enhances the difficulty of attributing criminal events to alcohol. Thus, the Bard and Zacker data do not support theories which argue that alcohol causes or contributes to assaultive behavior since alcohol was present in a greater proportion of non-assaultive than assaultive cases. The homicide data, which include the most extensive contextual data, do not demonstrate a strong relationship between contextual variables and drinking, a necessity for situationally specific theories. And while the limited personality data (Guze, 1962; Robins, 1972) do suggest a greater incidence of alcohol problems in criminal populations, these data suggest the cumulative character of social problems to a greater degree than a causal relationship between drinking and criminal behavior. This does not mean that no criminal events are a consequence of drinking. It does mean that, as yet, no alcohol specific theories of criminal behavior exist which can distinguish criminal events where alcohol is present from those where alcohol plays a causal role.

Crime in the United States

Crime, like drinking, has become a common occurrence in American society. An average of one criminal arrest was made for each five people in this country in 1974,⁵ excluding traffic violations. Most criminal offenses are those that are generally regarded as minor offenses; only an extremely small proportion of crime involves violent conduct. As shown in Table C-1, less than 5% of all reported crime is violent. Those crimes which have traditionally been thought to have the highest rate of alcohol involvement -- homicide and

assault -- make up less than 3% of all criminal offenses. A trend is evident in the past ten years in the direction of more violent behavior. In 1965, recorded violent crime was committed at a rate of 110.6 offenses for every 100,000 people; this rose in a ten-year period to 206.7 offenses per 100,000 people, an increase of 87%. The percentage change in serious property crime rate has exceeded the change in the rate of minor crimes by more than 6 times (See Table C-1). As a percentage of the total, serious crime has risen from 16.8 in 1965 to 23.8 in 1975; i.e., serious crime now accounts for nearly a quarter of the total number of offenses for which an arrest is made. In numbers this means approximately 800,000 serious crime arrests in 1965, compared to nearly 2 million in 1975, a 250% increase.

Alcohol-defined crime (e.g. drunkenness), as well as such closely associated status crimes as vagrancy (offenses which we will call alcohol related), has declined in the past decade. Arrest rates for drunkenness, disorderly conduct and vagrancy have all shown a substantial downward trend; drunkenness declined from 31% to 15% of all reported criminal offenses (See Table C-2). In total, alcohol-defined or alcohol-related offenses (e.g. vagrancy), including drunk driving, accounted for 38% of all offenses in 1975; excluding traffic, these alcohol related offenses accounted for 26% of all offenses. Comparable figures for 1965 are 53% and 48%. This change in the last decade as a result of major policy changes, symbolized by the Uniform Alcoholism and Intoxication Treatment Act (U.S. Dept. of HEW, 1971), has made the proportion of alcohol-defined or related crime the lowest since Prohibition.

Traditionally, the alcohol-defined or -related crimes have been the basic factor in calculating the proportion of crime that is a consequence of drinking. To the 26-38% of all offenses which are alcohol-defined or related is added some proportion of other crimes (usually those with alcohol present) to get an overall estimate of alcohol's share of the crime problem. Arriving at this proportion is what this review argues cannot be done. To do this requires that

TABLE C-1

Arrest Rate/100,000 and Percent of All Arrests, 1965, 1975 by Offense Group

	<u>1965</u>		<u>1975</u>		<u>1965-1975</u>
	<u>Rate</u>	<u>%</u>	<u>Rate</u>	<u>%</u>	<u>% Change</u>
Violent Crime ¹	110.6	2.99	206.7	4.64	86.9
Serious Property Crime ²	509.5	13.79	853.9	19.14	67.6
Other ³ (Minor)	3,073.0	83.20	3,394.6	76.20	-10.5

1 Violent Crime: murder, nonnegligent manslaughter, forcible rape, robbery and aggravated assault.

2 Serious Property Crime: burglary, larceny, and auto theft.

3 Other: other assaults, arson, forgery, fraud, embezzlement, stolen property, vandalism, weapon, narcotics, gambling, driving while intoxicated, liquor laws, drunkenness, disorderly conduct, vagrancy, suspicion, curfew and loitering, runaways, and other nontraffic offenses.

Source: FBI, Crime in the U.S., 1965, 1975 (Published annually in Washington D.C. by U.S. Government Printing Office).

TABLE C-2

Arrest Rate/100,000 and Percent of All Arrests,
1965, 1975 by Individual Offenses

	<u>1965</u>		<u>1975</u>		<u>1965-1975</u>
	<u>Rate</u>	<u>%</u>	<u>Rate</u>	<u>%</u>	<u>% Change</u> *
Criminal Homicide:					
a. Murder & Nonneg	5.5	0.15	9.2	0.22	67.3
b. Neg. Msltr.	2.1	0.06	1.7	0.04	(19.0)
Forcible Rape	8.0	0.22	12.3	0.28	53.7
Robbery	34.2	0.93	72.4	1.63	111.7
Agg. Assault	62.9	1.70	112.8	2.53	79.3
Burglary-br. & ent.	147.4	3.99	250.7	5.63	70.1
Larceny	286.2	7.74	535.1	12.01	87.0
Auto Theft	75.9	2.05	67.1	1.51	(11.6)
Other Assaults	154.8	4.19	196.8	4.42	27.1
Arson	4.6	0.12	8.1	0.18	76.1
Forgery & Counterfeit	22.8	0.62	32.3	0.72	41.7
Fraud	38.8	1.05	81.6	1.83	110.3
Embezzlement	5.7	0.15	5.2	0.12	(8.8)
Stolen Property	14.2	0.38	56.3	1.26	269.5
Vandalism	66.9	1.81	98.1	2.20	46.6
Weapons	40.0	1.08	73.1	1.64	82.7
Prostitution	25.3	0.69	28.0	0.63	10.7
Sex Offenses	43.4	1.17	28.4	0.64	(34.6)
Narcotics	34.4	0.93	283.6	6.36	724.4
Gambling	85.2	2.31	27.6	0.62	(67.6)
Family & Children	45.5	1.23	29.8	0.67	(34.5)
DWI	180.1	4.87	507.1	11.38	181.6
Liquor Laws	133.7	3.62	149.0	3.34	11.4
Drunkenness	1144.7	30.98	656.3	14.73	(42.7)
Disorderly Conduct	425.2	11.51	353.0	7.92	(17.0)
Vagrancy	89.8	2.43	33.1	0.74	(63.1)
All other (exc. traffic)	396.7	10.74	579.1	13.00	46.0
Suspicion	56.9	1.54	16.2	0.36	(71.5)
Curfew & Loitering	53.9	1.46	62.6	1.40	16.1
Runaways	67.3	1.82	105.4	2.36	56.6

* Parentheses indicate negative values

1 This data excerpted from FBI, Crime in the U.S., Washington D.C.:
U.S. Government Printing Office (published annually).

2 In this context, "minor offenses" signifies all crimes other than
criminal homicide, forcible rape, robbery, aggravated assault,
burglary, larceny, and auto theft.

criminal behavior which is associated with drinking be distinguished from criminal behavior which is a consequence of drinking. A review of the empirical research, however, reveals neither well articulated theory nor an adequate base of empirical data.⁶ In addition, data on relatively well-researched areas such as homicide suggest that alcohol alone is not responsible for criminal events, but is responsible, if at all, only in conjunction with other factors.

This report is organized into the following major sections. Section I is an overview of the literature relevant to describing the relationship between drinking and criminal behavior. Section II includes: (1) methodological constraints on the measurement of criminal behavior that bear on the alcohol/crime relationship; (2) methodological constraints on reported drinking involvement found in this research. Section III includes a review of the following literatures: (A) the literature on alcohol in criminal events, based on police case data: robbery, rape, assault, homicide; (B) the literature on alcohol in the criminal event based on prison data; (C) the literature on the drinking problems of criminal offenders; (D) the literature on criminal careers of labelled alcoholics. Section IV is devoted to a review of explanations of alcohol's role in criminal events.

Section I: Overview of Research on Alcohol and Crime

Most research on alcohol and crime has depended on two types of criminal justice data: (1) data on arrested populations, and (2) data on prison populations. Arrest record data are "closer"⁷ to the event and provide the most detail about the event, often including data about the victim. Studies of prison populations typically focus on characteristics of a selected sample of criminal offenders. Historically studies of prison offenders have been

the major source of data on the alcohol/crime problem. Police data on arrested cases have been used since the 1950s. This review regards the distinction between different populations as crucial. The process which takes the offender from arrest, to conviction, to imprisonment, to release, is one which affects the measurement of key variables for this research. Each transition is mediated by a variety of institutional processes which selectively affect the outcome of each criminal case.⁸

A recent and important source of data on the alcohol/crime problem is surveys of chronic inebriate offenders and alcoholics in treatment centers. These, typically, are small samples of men and women who differ markedly from those found in arrest populations or prison populations on a number of social, criminal and drinking characteristics.

Each type of study places limitations on the kinds of questions that can be asked about the relationship between alcohol and crime. One type focuses on those circumstances surrounding the criminal event, another looks at the criminal offender, another, the labelled alcoholic. Insofar as we are interested in the immediate role of alcohol in the event, the event-oriented arrest literature is most relevant. Insofar as we are interested in the cumulation of social problems in certain personalities, then the person-centered prison and alcoholics literatures are most relevant. Most reviews and research on these problems have failed to distinguish these literatures and have tended to treat all types of evidence as equivalent indicators of alcohol's responsibility for criminal behavior.⁹ Several types of literature are overviewed briefly below.

a. Alcohol in the Criminal Event

The literature on arrested populations is based, primarily, on information on a single type of criminal event, such as homicide. Information is collected on victims, offenders, and the general context of the event. Police reports/ files/records provide the basis for the material collected. Alcohol-involvement is measured in both victims and offenders by: (1) recording the level of alcohol content in the blood (hereafter BAC)¹⁰ and (2) a judgment of alcohol presence made by police or relevant witnesses. The focus is on crime with victims. This includes homicide, assault, sex offenses and robbery. Chart I (see Introduction) shows the proportion of offenders who had been drinking at the time of the offense. The evidence points to a dramatic difference in alcohol involvement for those committing the various crimes. Approximately 15% of the robbery offenders, 20% of the rape offenders, 28% of the assault offenders and 50% of the homicide offenders were reported to have been drinking at the time of the crime (See Tables in Section III A). Variation in these estimates arises from a variety of factors, e.g., clearance rates, method of alcohol reporting, definition of the casualty event itself.

There is also notable variation across studies of a single type of crime event, e.g., across studies of homicide. This comes from a variety of sources. Some studies consider only the alcohol involvement of victims, some only the alcohol involvement of offenders, some look at both. Clearly, those that look at both victims and offenders increase the probability of showing alcohol involvement in the situation. Even studies comparable in design show wide variation in estimates of alcohol involvement. The

Criminal Justice Commission (1967) in Baltimore reports 36% of homicide offenders to be alcohol involved; the Philadelphia study of Wolfgang (1958) shows the same proportion to be 54%.

b. Drinking Problems of Criminal Offenders

The research on prison/arrested populations is based primarily on surveys; it covers all crimes for which offenders are imprisoned, with occasional emphasis on a particular crime. Alcohol involvement is measured by (1) inmate reports of drinking during criminal events; (2) inmate or official reports of the role of alcohol in the life history of the inmate. Most prison studies focus on the drinking history of the criminal actor rather than drinking before or during the criminal event. Drinking problems are either taken as prima facie evidence for the involvement of drinking in the criminal event or as evidence of general moral pathology. Chart II (Chapter I) shows the variation in reported alcohol problems in studies of this type. Small samples and diverse measures of alcohol problems are responsible for most of this variation.

c. Criminal Careers of Labelled Alcoholics

The third group of studies looks at the criminal histories of labelled alcoholics. This group of studies is based on (1) criminal records of chronic inebriate offenders; (2) samples drawn from alcoholism treatment centers or hospitals. These studies often fail to distinguish public drunkenness arrests from other types of arrests; when types of arrests are distinguished, alcoholics show a relatively small proportion of arrests for crimes other than

those related to drunkenness. Variation in criminal involvement in these studies comes again from variation in types of populations of alcoholics (Charts IIIA and IIIB, see Introduction).

Several important kinds of studies in the alcohol/crime literature do not fit this literature taxonomy but are important to this analysis and will be reviewed separately. One group of studies looks at the patterning of criminal and drinking careers of criminal offenders. This research looks at differences between long-term and short-term prisoners; at the drinking patterns of recidivists; and at follow-up studies of paroled offenders. Another literature is that on drinking and criminal careers in the general population. This is used here primarily as a quasi-control group for event-based studies.

Section II.

Methodological and Reporting Problems in Research on Alcohol and Crime

Estimates of alcohol involvement in crime are greatly affected by the highly selective operation of legal processes. Three of the most important sources of bias in the reporting of crime events are underreporting of crime events, low and delayed clearance rates, and inequities in the criminal justice system.

A. Underreporting

Crimes are not reported to the police for a variety of reasons: the perceived effectiveness of extra-judicial action (e.g. with respect to employee theft); the embarrassment or invasion of privacy inherent in reporting a crime; lack of confidence in the police's ability to solve the problem. As a result, other methods of discovering unreported crime have been used in recent years; the most important of these are general population surveys of victimization. A comparison of the largest of these surveys (the NCP victimization survey) with the FBI's uniform crime report reveals, not surprisingly, vast differences in the incidence of crime (Table C-3). Victim surveys unfortunately do not include either the reported alcohol involvement of the victim or the perceived alcohol involvement of the offender. Depending on the assumptions made about the alcohol involvement in unreported crime as compared to crime that is reported, estimates of the overall involvement of alcohol in criminal behavior can be as much as halved.

Table C-3

Offense Known and Victimization Rates/100,000 - 1973, 1974

	<u>FBI UCR's</u> ¹		<u>NCP</u> ²	
	<u>1973</u>	<u>1974</u>	<u>1973</u>	<u>1974</u>
Violent Crime	415	459	1,487	1,559
Homicide	9	10	--	--
Forcible Rape	24	26	70	78
Robbery	183	209	644	679
Aggravated Assault	198	214	773	802
Property Crime	3,714	4,363	14,985	16,096
Burglary	1,215	1,429	3,739	3,881
Larceny-Theft	2,058	2,473	10,610	11,580
Motor Vehicle Theft	441	461	636	635

¹FBI, Uniform Crime Report, 1975.

²National Crime Panel Victimization Data taken from: Criminal Victimization Surveys in 13 American Cities, 1975, U.S. Government Printing Office.

B. Clearance

Clearance rates give the proportion of criminal events for which a suspect has been apprehended. The percentage of crimes cleared by arrest is dependent upon a variety of factors, including notification of authorities, the relationship between the offender and victim, the seriousness of the offense, and the memory and cooperativeness of the victim and witnesses. If drinking offenders are those most susceptible to capture, low clearance rates may cause those who are drinking to be over-represented in official arrest statistics. Table C-4 gives the clearance rate by offense and size of place.

Alcohol data based on arrested populations are constrained by the fact that few crimes other than homicide have either a high clearance rate or are cleared close to the time of the event. Of all violent crimes -- those thought to be most alcohol involved -- less than half the crimes are ever cleared. The clearance rate is higher than this for rural crime (70%) but rural crime makes up only 7% of all violent crime (Table 29, UCR, 1975).

Lesser crimes, i.e., property crimes, are cleared in fewer than 20% of the cases

Table C-4

CLEARANCE RATE OF OFFENSES KNOWN TO POLICE,
BY OFFENSE AND SIZE OF PLACE, 1970 AND 1975

	Cities ^a		Rural ^b	
	1970	1975	1970	1975
Grand Total ^c	21.0	—	24.8	
Crime Index Total ^d	20.1	21.0	25.7	23.6
Violent Crime ^e	47.6	44.7	71.7	70.1
Murder (and non-negligent manslaughter)	86.5	78.3	87.7	82.7
Forcible Rape	56.4	51.3	70.2	69.6
Robbery	29.1	27.0	47.6	47.3
Aggravated Assault	64.9	63.5	75.2	73.5
Property Crime ^f	16.1	18.5	20.9	19.4
Burglary	19.4	17.5	21.1	19.5
Larceny-Theft	18.4	19.7	18.6	17.5
Motor Vehicle Theft	16.9	14.4	38.2	36.3

- a. All cities regardless of size (approximately 60% of total U.S. population)
b. Unincorporated nonsuburban areas; a + b ≠ total U.S. population
c. All crimes, including many not listed in table
d. Violent and property crime
e. Murder, nonnegligent manslaughter, forcible rape, robbery, and aggravated assault
f. Burglary, larceny of \$50 or more, and auto theft

FBI: Uniform Crime Report, 1970, 1975

and few of these are cleared close in time to the event. This is due, in part, to the fact that property crimes have fewer witnesses to interrogate and merit less time in police investigation. Data from a recent study of robbery demonstrate the potential effect of some of these variables on estimating alcohol involvement.

Five types of robbery are identified in the study (see Table C-5). More than half of all robberies occur "in the open". We would expect that a large proportion of these crimes are never cleared, much less cleared during or immediately following the commission of a crime. In fact, about 60% of robberies



TABLE C-5

Robbery Group	1964		1965		1966		Average	
	%	ss	%	ss	%	ss	%	ss
I Robbery of persons who, as part of their employment, were in charge of money or goods.	25.3	4.09	24.1	4.43	22.9	4.52	25.8	4.14
II Robbery in the open following sudden attack	53.1	4.72	53.9	4.69	54.8	5.07	52.2	4.62
III Robbery on private premises	7.2	4.81	7.4	4.72	7.1	5.05	7.3	4.64
IV Robbery after preliminary association or short duration between victim and offender	9.8	3.96	10.7	4.48	10.4	4.47	10.2	4.07
V Robbery in cases of previous association of some duration between victim and offender	4.6	4.14	3.9	4.51	4.8	4.54	4.5	4.12
Percentage (TOTAL)	100.0		100.0		100.0		100.0	
Number	275		289		250		1722	
Average ss		4.51		4.60		4.81		4.42

Note: ss = average seriousness score per event.

Source: Normandeau (1968).

Table C-6

Proportion Not Cleared By Robbery-Group: 1960 to 1966, Philadelphia sample.

Group	Cases Not Cleared							Average
	1960	1961	1962	1963	1964	1965	1966	
I Robbery of persons who, as part of their employment, were in charge of money or goods	71.9	72.3	74.4	77.2	77.2	79.9	82.5	76.5
II Robbery in the open after sudden attack	59.2	58.2	56.7	54.3	58.1	66.0	59.9	59.9
III Robbery on private premises	43.9	46.4	46.3	49.7	53.1	53.4	54.1	49.6
IV Robbery after preliminary association of short duration between victim and offender	20.4	19.9	19.4	17.1	21.2	23.4	18.5	20.0
V Robbery in cases of previous association of some duration between victim and offender	7.4	7.2	5.5	4.1	6.2	8.1	4.3	6.1
TOTAL	58.9 (201)	58.3 (221)	55.8 (244)	53.5 (242)	59.0 (275)	65.7 (29)	58.8 (250)	58.6 (1722)

Source: Normandeau (1968)

Table C-7

Proportion of Cases Cleared By Time Interval Before The Offense of Robbery Became Known to the Police: 1960 to 1966 (Average) Philadelphia Sample

Time Interval	Percentage	Proportion Cleared
Home	10.2	92.7
Less than 10 minutes	48.3	51.4
10 to 30 minutes	15.4	29.7
30 to 60 minutes	12.1	29.9
1 to 3 hours	5.9	10.2
3 to 24 hours	4.8	5.8
24 hours and over	3.3	2.5
Total	100.0 (1205)	41.4

Source: Normandeau (1968)

in the open are not cleared (see Table C-6). Further, if an offender is not picked up during or within 10 minutes of a robbery the odds are in his favor that he will not be picked up at all (see Table C-7). Fewer than 60% of all reported robberies are known to the police within 10 minutes. In those cases where the crime is not known to the police within 10 minutes, the chances are only 1 in 3 that the crime will be cleared.

We can assume that the percentage of offenders picked up by the police during or immediately after the crime is greater when the victim and offender are acquainted (Type IV and V, Table C-6). This is supported by the data. Additionally, robberies where victim and offender are acquainted are events we assume are likely to be preceded by drinking. Nearly half occur "in the vicinity of a public house after drinking together"; 10% occur in the home of the victim or offender; 11% occur during an encounter between a prostitute and another person. While these occasions account for only 15% of all robberies, they are the ones most likely to be cleared and therefore to enhance alcohol involvement, if our assumptions about drinking and victim/offender relationship are correct. Given the small proportion of all robberies which are cleared close in time to the crime, and the biased sample of robberies which are cleared, little can be known directly about the presence of alcohol in robberies in general.

Few studies attempt the type of analysis we have done above, i.e. few studies look at alcohol involvement within a single type of crime, such as robbery. Sex offender studies are an exception. McGeorge (1963) reports, for sex crimes, that the proportion of offenders with alcohol problems varies considerably by type of crime. The proportion "addicted to drink" who were convicted of sexual offenses varied from 26% to 75% depending on the type. Although based on small numbers, the findings were:

Indecent assault on male (adult)	75%
Rape	56%
Indecent exposure	46%
Indecent assault of male (child)	27%
Indecent assault of female	26%

Low and delayed clearance rates are variable across crimes and within

type of crime. Insofar as patterns of alcohol involvement vary by type and within type of crime -- and there is evidence that this is so -- the data will not reflect an accurate picture of the role of drinking in crime events.

C. Inequity

Differential crime rates by social class, sex, race, and age result, in part, from institutional or law enforcement inequities. These inequities may have substantial impact on what is known about factors associated with crime. Much of the argument around the inequity issue, however, is intuitive rather than empirical.

The most fundamental cultural or class bias found in criminal statistics is the public perception and definition of criminal behavior itself. Laws are formulated and enforced by a dominant class. Disproportionate attention and moral obloquy is directed toward types of crimes most commonly committed by lower income, minority people.¹¹ In addition, those who are well-off and/or well-educated have resources at their disposal that reduce the likelihood of their being apprehended. They have the ability gained from owning a good vehicle to facilitate a getaway; funds to invest in better equipment to perform a criminal act quickly and competently; better verbal skills which may be determinative in chance interactions with police; and money with which to buy protection or bribe an enforcer.

If caught, those of higher status are less likely to be prosecuted, and if prosecuted, they are more likely to have better legal counsel.¹² Insofar as drinking patterns are related to those factors only a partial picture of the role of alcohol in criminal events is forthcoming.

The manner in which law enforcement personnel are deployed also exerts an impact upon official crime rates. Police often dismiss from suspicion the "decent" members of the community, and expend disproportionate

resources upon the poor, often minority segments of the population. Known offenders or "out of place" characters are routinely observed and questioned. Undercover detectives are deployed in low income neighborhoods, but rarely in middle class neighborhoods. Police are more likely to observe a crime if it occurs in one of their targeted areas, while less conventional or less conspicuous criminal events in other areas go largely unnoticed.¹³

Underreporting, clearance rates, and differentiation of means are all mechanisms which cause attrition from the population of offenders. Conviction and sentencing also affect this attrition. As Table C-8 shows, only 61% of offenders charged are convicted on charges for which they were held; 4% are convicted of lesser charges, 16% are acquitted or dismissed, and 19% are referred to juvenile court. A number of variables affect the likelihood of conviction, including the race of both victim and offender, the relationship of victim and offender, their criminal careers and the seriousness of the crime.¹⁴ A conviction is most likely to occur when the victim is white, a stranger to the defendant, and willing to testify. In at least one study, drinking directly affected attrition from the population of offenders, in this case a potential prison population. In this study, drinking prior to the offense was associated with dismissal for a significant proportion of moderately serious offenses and was fairly strongly associated with a not guilty verdict in homicide cases.¹⁵

Little is known, however, about the effects of differential patterns of sentencing on measured drinking involvement in a prison population. Age, sex, and urbanization each affect sentencing. This means that, other things being equal, rural blacks are more likely than whites to go to prison; young offenders are less likely than older offenders to go to prison; and women are less likely than men to go to prison. On the whole, differential treatment tends to work in the direction of apprehending, convicting, and sentencing those who have committed the most serious offenses, those convicted of prior offenses, and those who are older. Thus, prison populations differ from jail populations and from each other.

Table C-8. —Disposition of Persons Formally Charged by the Police, 1975

[2,925 cities; 1975 population 39,020,000]

Offense	Number of persons charged (held for prosecution)	Percent of charged ¹			
		Guilty		Acquitted or dismissed	Referred juvenile court
		Offense charged	Lesser offense		
Total	1,556,071	60.7	3.8	16.5	19.0
Criminal homicide:					
(a) Murder and nonnegligent manslaughter.....	1,734	48.1	12.7	30.3	8.9
(b) Manslaughter by negligence.....	330	51.2	9.1	24.2	15.5
Forcible rape.....	2,419	33.0	9.9	36.5	20.7
Robbery.....	13,916	35.6	5.5	22.2	36.3
Aggravated assault.....	25,188	41.4	9.7	31.9	17.0
Burglary-breaking or entering.....	69,831	26.7	4.8	12.1	56.5
Larceny-theft.....	150,329	41.2	2.8	13.7	39.2
Motor vehicle theft.....	19,615	20.0	3.6	13.8	62.5
Violent crime ²	43,287	39.3	8.6	20.0	23.1
Property crime ³	279,975	38.1	3.4	13.3	45.2
Subtotal for above offenses.....	323,592	38.3	4.1	15.4	42.2
Other assaults.....	61,574	47.7	2.8	36.1	13.4
Arson.....	2,224	22.8	3.3	15.6	58.3
Forgery and counterfeiting.....	8,833	53.4	6.3	22.6	17.8
Fraud.....	23,321	60.6	3.4	32.4	3.7
Embezzlement.....	727	43.7	9.8	20.3	17.2
Stolen property; buying, receiving, possessing.....	13,421	38.0	4.9	26.8	30.3
Vandalism.....	29,219	28.7	1.9	10.9	49.6
Weapons; carrying, possessing, etc.....	24,648	60.7	4.0	23.5	11.8
Prostitution and commercialized vice.....	7,434	51.4	9.8	31.9	6.8
Sex offenses (except forcible rape and prostitution).....	8,110	50.0	7.3	25.4	17.3
Narcotic drug laws.....	70,395	45.8	4.3	25.1	24.9
Gambling.....	10,301	75.9	2.8	18.4	2.9
Offenses against family and children.....	6,613	51.7	3.8	27.1	17.5
Driving under the influence.....	180,197	74.8	15.5	8.3	1.4
Liquor laws.....	70,454	65.4	.9	9.6	24.1
Drunkenness.....	317,367	87.6	.8	9.7	2.0
Disorderly conduct.....	157,210	67.8	1.0	20.7	10.5
Vagrancy.....	5,035	53.5	2.4	24.9	19.2
All other offenses.....	231,438	52.4	1.6	19.5	26.5

¹ Due to rounding, percentages may not add to 100%.² Violent crime is offenses of murder, forcible rape, robbery, and aggravated assault.³ Property crime is offenses of burglary, larceny-theft, and motor vehicle theft.

Source: F.B.I., Uniform Crime Report, 1975

Gibbons and Silberman's (1970) observations on the British penal system, are relevant in the U.S. system:

"It is not easy to sample the prison population accurately. Immediately after sentence, offenders are distributed to prisons for first offenders or recidivists, and those for men serving long or short sentences. The daily population is, of course, heavily biased towards those with long sentences and is quite unrepresentative of those who go into or come out of prison."

Insofar as these variables are associated with drinking patterns, measured alcohol involvement in prison samples will be subject to bias and will vary from prison to prison.

Summary

Estimating the effects of the biases in criminal statistics on measured alcohol involvement in criminal events depends ultimately on what assumptions we make about the drinking patterns of offenders and victims involved in un-cleared and unreported crime. On the assumption that there is no difference between these crimes and cleared crimes, the alcohol involvement can stand as measured. Experimental studies, however, show a clear effect of alcohol intoxication on the performance of complex tasks, e.g., burglary (Moskowitz, 1973). On this view, alcohol involved offenders would be more likely than those not so involved to be arrested. Another view would suggest that alcohol involvement in crimes, rather than being enhanced by the above assumptions, is minimized by alcohol's role in unreported crime. An intoxicated victim of rape or assault, on this view, may be reluctant to report a criminal offense for fear of not being believed.

The impact on estimates of alcohol involvement when assumptions about bias in reporting are varied can be seen in the following analysis. On the assumption that the population of apprehended offenders includes all of the alcohol-involved

offenders who have actually committed a crime, the effect of varying clearance rates is as follows:

Table C-9

Estimated Alcohol Involvement in Cleared/Uncleared Crime Under the Assumption that all Alcohol Involved Crimes are Cleared

Assume that 60% of all cleared offenders are alcohol involved and assume that clearance rates vary from 85% to 45% for a given crime.

60% Assumed Alcohol Involvement	x	% Crimes Cleared	=	Estimated Alcohol Involvement in Cleared and Uncleared Crimes
$\frac{60}{100}$.	$\frac{85}{100}$	=	51%
$\frac{60}{100}$.	$\frac{65}{100}$	=	39%
$\frac{60}{100}$.	$\frac{45}{100}$	=	27%

Thus, estimated alcohol involvement can vary from 51% to 27% given 1) this stringent assumption of no alcohol involvement in uncleared crimes, 2) 60% involvement in cleared crimes and 3) a variable clearance rate. The same variation is apparent if the situation is defined in a different way. Only a small proportion of all crimes are cleared within six hours of the commission of the offense. If we assume a "real" alcohol involvement of 60% in criminal offenders, in situations where the proportion of crimes cleared within six hours drops only to 45%, the alcohol involvement can be as low as 27%.

D. Methodological Constraints on Measurement of Drinking Involvement

The problems of capture and conviction aside, ultimately the utility of these data depend on the validity and reliability of the alcohol variables. A wide variety of measures are found in these literatures. Alcohol presence is measured as a condition of the person, victims and/or offenders, before-during-after the event and as a factor in the victim or offender's personality/personal history.

The measurement of alcohol involvement before-during-after the event is measured by:

- i) Administering chemical tests which measure alcohol content in the blood.
- ii) Obtaining statements from victims or offenders as to whether they had been drinking, how much they drank, how drunk they thought they were, and how they thought the alcohol affected the course of events in question.
- iii) Reports of the arresting officer or statements from witnesses, that the offender was drinking or drunk.

Alcohol use/abuse as a factor in the life of the offender/victim is measured by one of a number of diagnostic criteria. The diagnostic items include: some measure of quantity and frequency of alcohol use, past problems with liquor, history of delirium tremors/blackouts, inability to quit drinking, drinking non-beverage forms of alcohol.

Each of these measures suffers from problems in reporting. These are presented in detail in Chapter 1 and are summarized below.

Alcohol Reports on Offenders -- Chemical tests for blood alcohol are by far the most precise measurement of alcohol involvement. However, since the elapsed time between offense and arrest is greater than six hours in the vast majority of criminal cases, a BAC can be taken on only a small sample of offenders.¹⁶ No study determines the representativeness of a sample of measured offenders with respect to the full sample. Because no implied consent ruling operates in areas of criminal jurisdiction other than traffic, offenders can refuse, with impunity, to cooperate with alcohol testing.

Witness reports, as well as the reports of arresting officers, may be biased by factors such as prior knowledge of the offender's drinking history, failure to admit evidence where it exists, or fabrication of evidence where it does not exist.



CONTINUED

4 OF 9

"Alcohol presence" is the measure most commonly used in studies of arrested population. But "presence" alone says nothing about the level of intoxication in the offender. Knowing the degree of intoxication is especially important for theories which include appeals to the physiological effects of alcohol in their explanations of the alcohol/crime relationship.

Alcohol Reports on Victims--Reports on victims suffer from the problems above as well as others. Victims may be reluctant to admit drinking involvement for fear of being perceived as responsible for the crime. Homicide victims, especially, may not be discovered within six hours of death. Victims of other crimes may fail to report the crime within six hours.

Alcoholism or Drinking Problems--As the data will show, these measures are diverse and non-comparable. Diverse orientations toward measures of problem drinking and alcoholism leave open the broadest area of discretion for the investigator. What may be noted as evidence of "acute alcoholism" in a crime event may be nothing more than what would be noted as having a good time at a wedding reception. However, when the agenda is one of exploring the role of alcohol in deviant events, the alcohol in the event is perceived as having only pathological properties.

Self-reported Alcohol Involvement--May be affected by both the memory and intent of the offender. Either of these factors could work to enhance or disavow the involvement of drinking (see Roizen, 1977).

Section III.

Contemporary Empirical Research on Alcohol and Crime

Contemporary research on alcohol and crime is characterized chiefly by its empiricism.¹⁷ The problem of drunkenness in the nineteenth century, the psychiatric view of "alcoholism" in the first part of the twentieth century, and the beginning of a research tradition associated with the disease "alcoholism" between 1940 and 1950 have all been organizing frameworks for empirical research. Genetic, environmental, and psychological theories have provided a basis for explaining the role of drinking in crime problems during one period or another until well into the middle of the twentieth century. Beginning in the early fifties, however, research on both prison and arrested populations came to be dominated by a kind of naive empiricism. This is explained, in large measure, by the absence of a general theory or theories of alcohol problems which would guide data collection, but also stems from the increasing interest of state and local criminal justice agencies in empirical research. While many of the empirical indicators used in this "social indicators" research -- e.g., drinking at the time of the event or problem drinking in a captured population -- are not different from those used in a previous generation, they are indicators which have been coupled from their theoretical moorings. In place of the theories of several decades earlier, a kind of implicit theoretical link between alcohol and criminal acts has been posited but never fully articulated.

The absence of a general theory or theories of alcohol-involved social problems has been a serious constraint on diversity in the collection of data about criminal events. The disease theory of alcoholism, theories of drinking problems, and theories of deviance should be different organizing frames to research on crime problems. But these controversies in

the alcohol literature have been ignored, by and large, in contemporary research on drinking and crime. This is especially true with respect to data on the event (i.e. a crime event) itself.

The contemporary empirical research on drinking and crime is associational research.¹⁸ There is active restraint on making causal claims, although causal claims are often implicit in the structure of the research design. With few exceptions, the research is organized around neither an alcohol theory or theories nor a crime theory. The question then which must be asked of this alcohol/crime data is whether crime, or some aspect of crime, can reasonably be called a consequence of drinking or a drinking problem. R. Roizen has argued,

"Calling something a drinking problem, of course, has a number of important implications and functions for research. By defining the phenomena which will be focused on, it has a large share in determining the sorts of data that will be collected, the literatures used, the outlets for publication, the audiences that may be watching, the agencies that may support it, and the shape of the intellectual and policy outputs that are sought. In many instances, research associated with social problems takes its 'problems' from the prevalent cultural definitions of the 'problem' and draws its support from the agencies whose boundaries have been marked by that same definition. From a research standpoint, however, the utility of a particular conceptualization is borne by the usefulness (or potential usefulness) of the theoretical propositions of which that conceptualization is a part. And that utility is ultimately tied up with the amount of order and comprehensibility that is brought to a domain that was puzzling or chaotic beforehand."¹⁹

A review of contemporary empirical research on the role of drinking and criminal behavior shows a wide variety of behaviors, contextual settings, and demographic variables to be associated with drinking and criminal acts. These data taken together, do little to make the case that crime is a function of drinking. Ultimately, bringing coherence to these disparate facts depends on the strength of an organizing theory. As we argue in Section IV there is no compelling organizing theory which does this.

Section III-A Alcohol in the Criminal Event - Police Case Studies

Research drawn from data on arrested populations explores situational determinants of criminal events rather than long-term personal or social predispositions to alcoholism, sociopathy or poverty. The principal foci are violent crimes -- crimes against persons -- primarily robbery, rape, assault and homicide. Most contemporary crime-specific research follows the basic design of the initial work of Wolfgang on homicide (1958). Studies using this design include detailed data on offenders, victims, victim-offender relationships, and the physical circumstances around the event. This design has been used in many subsequent studies of homicide, and at least one study modelled after Wolfgang is found in research on rape, robbery, assault.

Research which uses a Wolfgang type design contains, by far, the most complete data on victims, offenders and the event. The data sets include race, sex, age and alcohol presence of victims and offenders, previous record of offenders, temporal patterns, spatial patterns, degree of violence, method, motive and various observations concerning victim-offender relationships. One unintended consequence of use of the Wolfgang design is the recurrent use of Philadelphia as the jurisdictional boundary.

1. Robbery

Robbery is a crime "which takes place in the presence of the victim to obtain property or a thing of value from a person by the use of force or threat of force."²⁰ In 1975 the robbery rate was 218 per 100,000 population, making it a problem twenty times as common as homicide. In big cities

Table C-10

PREVIOUS ARREST RECORD OF ARRESTED VICTIMS AND
OFFENDERS IN DIFFERENT STUDIES (In per cent)

Study	Victims		Offenders	
	Record	No Record	Record	No Record
<u>Robbery</u>				
Philadelphia	8	92	84	16
Montreal ^a	7	93	95	5
London ^b	-	-	((70))	((30))
Washington ^c	-	-	(97)	(3)
Washington ^d	-	-	((89))	((11))
<u>Homicide</u>				
Philadelphia ^e	47	53	64	36
Montreal ^f	22	78	63	37
Washington ^g	38	62	(83)	(17)
Washington ^h	-	-	((71))	((29))
Baltimore ⁱ	46	54	65	35
<u>Rape</u>				
Philadelphia ^j	19	81	49	51
Montreal ^k	13	87	57	43
Washington ^l	-	-	(94)	(6)
Washington ^m	-	-	((77))	((23))
<u>Aggravated Assault</u>				
Montreal ⁿ	19	81	56	44
Washington ^o	20	80	(91)	(9)
Washington ^p	-	-	((82))	((18))
St. Louis ^q	48	52	62	38
<u>Violent Crimes</u>				
London ^r	-	-	((58))	((42))

Note: A single parenthesis means that the percentages refer to previous "arrest" records of "convicted" offenders and a double parenthesis to previous "conviction" records of "convicted" offenders. No parenthesis refers, obviously, to previous "arrest" records of "arrested" offenders.

"a-q" refer to particular studies referenced in Normandeau (1968)

Source: Normandeau, (1968)

robberies occurred at a rate more than double the national average--574 reported victims per 100,000 population. Two thirds of all robberies in 1975 involved the use of weapons. Nearly half of all robberies involved the use of a gun. Blacks committed 59% of the robberies. Teenagers under the age of 18 committed 35% of the robberies. Women committed 7% of robberies. Of all violent crimes robbery involves the largest proportion of offenders with previous arrest records and the smallest proportion of victims with previous arrests (See Table C-10).

Robbery is a crime perceived to require planning, skill and judgement, while tradition associates alcohol with unplanned, "disinhibited," impulsive action.²¹ On the common view, then, little alcohol involvement would be expected among robbery offenders. However, a recent comprehensive study of robbery indicates that most robberies in the large-city studied were "sudden attacks" in the open, which took place on weekends, typically times of heavy drinking activity. As Table C-11 shows, there is little event-centered data to support an argument for alcohol involvement. Although the two U.S. studies of robbery offenders -- those of Shupe (1954) and Normandean (1968) -- show widely differing estimates of alcohol involvement, the Shupe study is of little or no value because of its biased sample of offenders. Shupe, the most oft-cited article in the alcohol/crime literature, reports 72% of robbery offenders to be alcohol-involved, compared to 7% in the Normandean

Table C-11
Empirical Studies Table--Crime
Robbery Offenders and Victims

Author, Date, Location	Sample	% Alcohol Offender	% Alcohol Victim	Alcohol Measure
<u>United States</u>				
Shupe, 1954	85 apprehended offenders	72	--	UAC *
Normandean, 1968, Philadelphia, Pa.	892 cases of robberies 892 offenders, 892 victims	7	12	Police reports/ Alcohol presence
<u>Foreign</u>				
Tardif, 1964, Montreal, Canada	212 cases of robbery 117 offenders, 212 victims	12	16	Police Records/ Alcohol presence
Marek, et al., 1974, Poland	100 male victims of robberies	--	69	Police Records/ Alcohol presence
Leppa, 1974, Helsinki, Finland	1516 victims of robberies (1963-1973)		66	Police Records/ Alcohol presence

study. The Shupe study is so often cited because it is one of few in the crime literature which gives a precise measurement of alcohol involvement (BAC or UAC) for the offenders.

Shupe measured the urine alcohol level on those offenders captured within 6 hours of the crime, certainly a small proportion of all offenders. In a homicide study which attempted to measure blood alcohol, this time constraint caused the BAC to be taken on only 5.4% of offenders (Hollis, 1974). The Shupe study fails to report the proportion of offenders on whom a UAC is taken. Both the Shupe study and the Hollis study show an extremely high level of alcohol presence.

The Normandeau study, which depends on police reports, shows one-tenth the alcohol involvement of the Shupe study; however this estimate like the Shupe estimate may also be a function of low and delayed clearance. Delayed clearance rates affect both the ability of the arresting officer to reconstruct the role of alcohol in the event, as well as the ability of the arresting officer to obtain BAC's on other than a small proportion of offenders. This results in an under-estimate of the role of alcohol in robbery events when police reports of the presence of alcohol are used and an overestimate when BAC's are taken.

Several foreign studies turn the focus of attention to the victim of robberies rather than the offender. These studies show the majority of victims of reported robberies to have been drinking at the time of the criminal event. The findings from Poland, (See Table C-11), and from Finland (Table C-12) are particularly striking. The U.S. results (Normandeau, 1968) show less alcohol involvement but support the findings from foreign studies (Table C-13). Over half of the robberies in which alcohol was involved in the situation, involved the presence of alcohol in the victim only. In these situations, men were considerably more likely than women to be the intoxicated victim of robbery attacks.

Alcohol as a victimogenic factor is an important but relatively unexplored aspect of the alcohol and crime question -- one which should receive the attention of both researchers and policy makers in the future. In the special context of Skid Row drinking, the vulnerability of drunken persons to robbery by "jack-



Table C-12 Distribution of the robberies reported to the Crime Section of Helsinki Police Force in 1963-1973, in absolute figures

	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973		
<u>Victim of the Robbery</u>	<u>(N)</u>												
Intoxicated Person	79	54	53	57	114	72	120	172	171	279	345	1516	66.5%
Sober Person	21	21	17	37	47	26	47	61	93	104	146	620	27.2%
Business Enterprises	6	7	3	7	6	5	6	9	25	30	41	142	6.2%
Total	106	82	73	101	167	103	173	242	289	413	532	2278	100.0%

Distribution of robberies reported to Crime Section in 1963-1973, in percentages

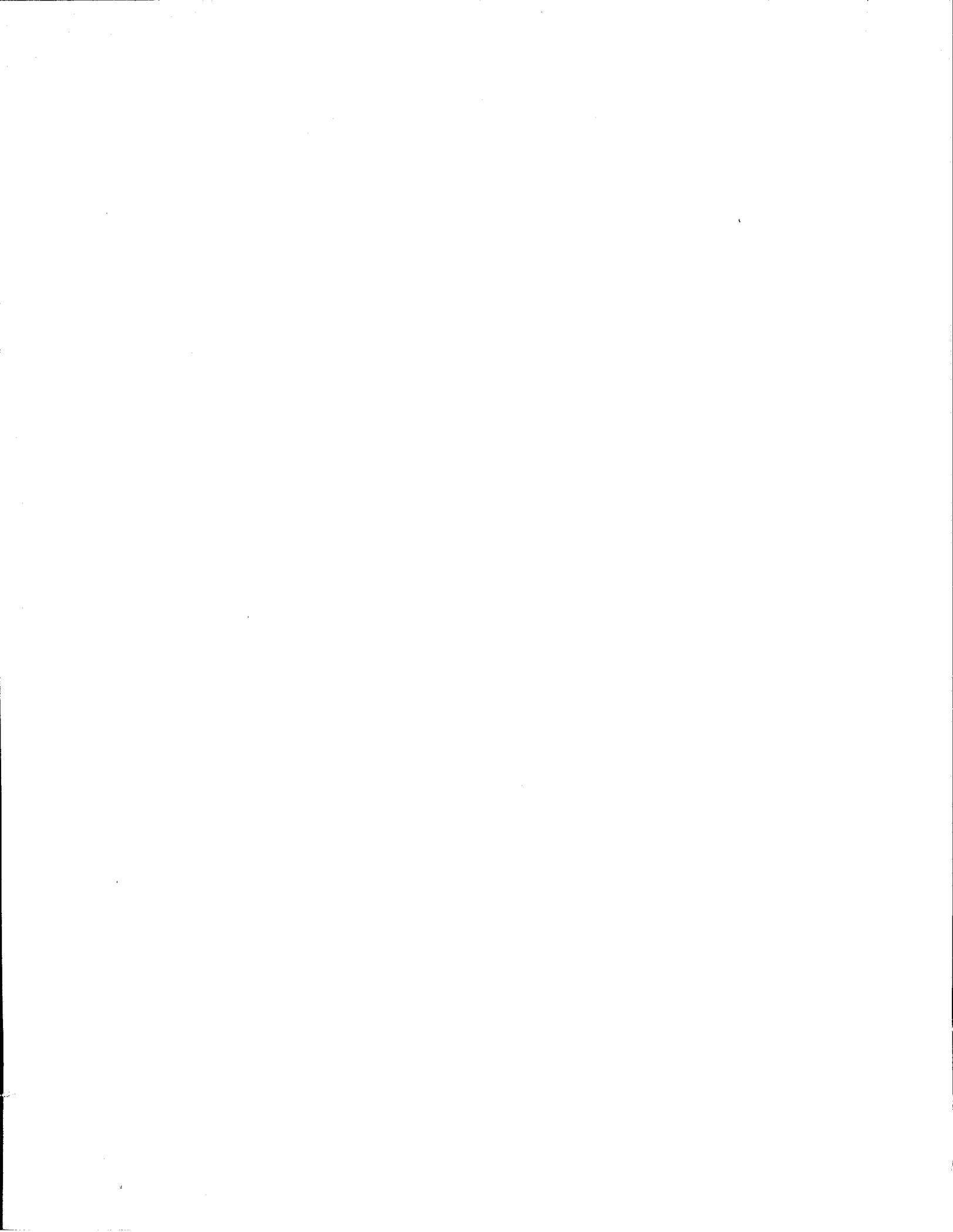
	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	Total	Total
<u>Victim of the Robbery</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>N</u>
Intoxicated Person	75	66	73	56	68	70	69	71	59	68	65	66	1516
Sober Person	20	26	23	37	28	25	27	25	32	25	27	27	620
Business Enterprises	5	9	4	7	4	5	3	4	9	7	8	6	142
Total	100	101	100	100	100	100	99	100	100	100	100	100	2278

Source: Leppa (1974)

Table C-13 Presence of Alcohol in Crimes of Robbery, by Race and Sex of Victim:
1960 to 1966 (average). Philadelphia sample. (In percent)

Alcohol when offender is arrested	Both Races			Negro			White		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Alcohol present in both victim and offender	3.3	3.3	3.2	3.5	3.6	3.2	2.9	2.8	3.1
Alcohol present in the victim only	8.2	9.1	5.5	8.7	10.2	5.8	7.3	8.4	5.0
Alcohol present in the offender only	3.9	3.8	4.1	4.1	3.8	5.0	3.4	3.6	3.1
Total alcohol present	15.4	16.2	12.8	16.3	17.6	14.0	13.6	14.8	11.2
Total alcohol absent	84.6	83.8	87.2	83.7	82.4	86.0	87.4	85.2	88.8
Grand total (events)	100.0 (892)	100.0 (651)	100.0 (241)	100.0 (563)	100.0 (429)	100.0 (134)	100.0 (329)	100.0 (291)	100.0 (108)

Source: Normandeau (1968)



rollers" has long been recognized: Sutherland and Locke describe the jack-roller as the "worst enemy" of homeless drinkers (1971, p. 120; see also Anderson, 1923, pp. 51-52; Shaw, 1930; Wallace, 1965, pp. 73-74; Bahr, 1973, pp. 170-171). Perhaps because the victim of such crimes is himself often viewed as an unwelcome resident whose drinking and deportment invites the crime, this area has not usually been viewed as a matter of special concern for policy-making.

Data from the Finnish study cited above shows the value of property taken from intoxicated victims to exceed the value of property taken both from businesses and from sober victims (Table C-14). The study also shows a greater incidence of robbery in the night time hours. Table C-15 shows the proportion of robbery victims who are intoxicated by time of day. Between ten and three p.m. three-quarters of all victims are intoxicated. However, while a large proportion of those who are robbed at night are drunk, drunks are no more likely to be robbed at night than those who are sober. If we look at the distribution in a day of robberies for intoxicated and sober victims separately, we see that the proportions of robberies occurring late at night are quite similar for intoxicated and sober victims. Forty-two percent of robberies of intoxicated victims and 50% of robberies of sober victims take place between ten o'clock at night and two o'clock in the morning.

Table C-14

Median annual monetary value of the property victims dispossessed of (the value of the property inflated to the 1973 level) by victim groups (Finland)

<u>YEAR</u>	<u>Victim Group</u>			
	<u>Intoxicated Persons</u>	<u>Sober Persons</u>	<u>Business Enterprises</u>	<u>All the Robberies</u>
1963	119*	77	--	98
1964	149	59	--	96
1965	185	78	--	178
1966	195	88	--	167
1967	177	77	--	153
1968	164	91	--	152
1969	225	51	--	151
1970	171	81	--	146
1971	152	76	99	120
1972	171	102	125	142
1973	159	135	59	152

* All the values in Fmks.

Source: Leppa (1974)

Table C-15

Proportion Intoxicated Victims x Time of Day (Selected Times--Finland)

	<u>Time of Day</u>			
	<u>12-5:59 p.m.</u>	<u>6-9:59 p.m.</u>	<u>10-11:59 p.m.</u>	<u>12-3:00 a.m.</u>
Intoxicated person	44%	60%	73%	79%
Sober person	35	35	25	20
Business person	21	5	2	1
	100%	100%	100%	100%
	N=125	N=155	N=85	N=105

Source: Leppa (1974)

(next page is p. 340)

2. Rape

Forcible rape is among the most rapidly increasing reported violent crime. Forcible rape includes assault to commit rape as well as the actual commission of rape, "carnal knowledge of female through the use of force or the threat of force." Statutory rapes are not included here. There were 56,000 forcible rapes reported for the year 1975 in this country, a rate of 51 per 100,000 women in the population. The proportion and rate of rapes varies considerably by region: the southern states show the greatest number of rapes and the western states show the highest rate. Metropolitan areas report rates of 61 per 100,000; non-metropolitan areas and rural areas report rates of 26 and 31 per 100,000, respectively. In 1975, 58% of rape offenders were under 25; 52% were white and 45% were black.

The range of alcohol involvement reported in studies of rape is shown in Table C-16. The Selling study is particularly interesting because it is one of only a few arrested population studies which gives a self-reported alcohol measure. Reported alcohol involvement in this study is consistent with self-reported estimates of alcohol involvement from sex offenders in prison. A Wolfgang-type design is used in both the D.C. and Philadelphia studies. While both rely on police reports, the differences in estimates of alcohol involvement are considerable. This could reflect differences in the quality of data or ecological differences. Both studies were done in large metropolitan areas with populations comparable on most major demographic characteristics, exclusive of race. Table C-17 shows the association between alcohol, race and rape events. Alcohol was present in 42% of the rape situations in which the offender was white, and in 24% of the rape situations in which the offender was black. This relatively strong association alone could be expected

Table C-16
Empirical Studies Table--Crime
Sex Offenses, Offenders, and Victims

Author, Date, Location	Sample	% Alcohol-Offender	% Alcohol-Victim	Alcohol Measure
<u>United States</u>				
Selling, 1940, Detroit Michigan	100 cases, male sex offenders	43	--	Combination self-reports & police report
Shupe, 1954, Columbus Ohio	42 apprehended rapists	50	--	UAC
President's Commission on Crime in D.C., 1966	151 cases of rape 200 offenders, 151 victims	13	6	Police reports Alcohol presence
Amir, 1971 Philadelphia, Pa	646 cases of 1292 offenders, 646 victims	24	31	Police reports/ Alcohol presence
<u>Foreign</u>				
Tardif, 1966, Montreal Canada	112 cases of rape 67 offenders, 112 victims	31	16	Police reports/ Alcohol presence

Table C-17
Rape and the Presence of Alcohol by Race of Offender

	<u>Negro</u>		<u>White</u>		<u>TOTAL</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
Alcohol in both	190 (74.6)	17.8	82 (86.4)	36.4	272 (77.7)	21.0
In offender only	65 (25.4)	6.1	13 (13.6)	5.7	78 (22.3)	6.1
Total alcohol present	255 (100.0)	23.9	95 (100.0)	42.1	350 (100.0)	27.1
Alcohol absent	811	76.1	131	57.0	942	72.0
TOTAL	1,066	100.0	226	100.0	1,292	100.0

Source: Amir (1971)

to explain overall differences in alcohol involvement from study to study in those studies in which the racial distributions vary, provided that the race of offenders differed in the two studies. However, both Washington and Philadelphia report similar racial distributions of offenders.²² Variation in measured alcohol involvement may, then, result from differences in the level of attention paid to drinking in criminal events, from city to city. Whatever the explanation, these studies underscore the difficulty in measuring alcohol involvement in criminal events even when design is constant.

The Amir study has gathered the most complete data on alcohol involvement in rape events. These data show a strong association between alcohol use and type of interpersonal victim-offender relationship. Alcohol presence was twice as frequent in rapes involving strangers (alcohol was present in 44% of the cases) as in rapes involving primary relations (alcohol was present in 21% of the cases). It is particularly noteworthy that when only the victim had been drinking the victim and offender were strangers in 77% of the cases (Table C-18).

These data suggest that drinking plays any one of a number of different roles in crime situations. Drinking can enhance chances of victimization between strangers; it can be present in the offender alone and, perhaps, play a role in the events leading up to the commission of the crime; drinking, too, can be a part of the usual chain of circumstances between victim and offender before a violent act occurs. As Table C-19 shows, the great majority of alcohol-present rape situations involved both a drinking victim and offender.

Table C-18 Type of Interpersonal Relationship between Victim and Principal Offender by Presence of Alcohol in the Rape Events

	In Both Offender and Victim		In Victim Only		In Offender Only		Total Present in the Rape Situation		Total Absent from the Rape Situation		Grand Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Stranger	31	22.8	48	77.4	10	52.6	89	41.0	184	42.9	273	42.3
Stranger but general knowledge	53	31.0	5	8.1	2	10.5	60	27.6	2	0.5	62	9.6
Acquaintance	13	9.6	1	1.6	1	5.3	15	6.9	78	18.2	93	14.4
Neighbor (close)	13	9.6	5	8.1	2	10.5	70	9.2	105	24.5	125	19.3
Close friend or boyfriend	12	8.8	1	1.6	-	-	13	6.0	26	6.1	39	6.0
Family friend	6	4.4	1	1.6	1	5.3	8	3.7	26	6.1	34	5.3
Relative	8	5.9	-	-	1	5.3	9	4.1	7	1.6	16	2.5
No information	-	-	1	1.6	2	10.5	3	1.4	1	0.2	4	0.6
Total	136	100.0	62	100.0	19	100.0	217	100.0	429	100.0	646	100.0

343

Note: Analysis is made only on those interpersonal relations in which alcohol was present in the rape situation and for which information is available on interpersonal relationships (n=214).

Source: Amir (1971)



Table C-19 Alcohol Presence in Victim, Offender, Both
(% of Total Rape Events)

	N	%
Alcohol present in victim	62	10
Alcohol present in offender	19	3
Alcohol present in both	136	21
Alcohol not present	<u>429</u>	<u>66</u>
	646	100%

Source: Amir (1971)

Table C-20 Place of Initial Meeting for Rape Events

	<u>N</u>	<u>Percent</u>
Victim's place	223	34%
Offender's home	43	7%
On Street Walking	270	42%
In a Bar - In Street in Front Of Bar	70	11%
At a Party/Picnic	17	3%
In Park	5	1%
In Street Waiting for Bus/Car	<u>16</u>	<u>3%</u>
	646	100%

Source: Adapted from Amir (1971)

The social setting of rape events also suggests drinking involvement. More than 10% of rape events occur after meeting in, or outside of a bar (See Table C-20). Unfortunately, proximity to a drinking place is not given for the large proportion of rapes occurring "on street walking" (see Table C-20).

Several other alcohol-specific findings are noteworthy from this study. Rape involving a pair of men as compared to a single man or a group of men was considerably more likely to be alcohol involved (Table C-21). While planned rape does not show a strong association with alcohol in the rape situation generally, when the only drinking involvement was the victim's, 30% were planned or partially planned and 6% were labelled as an "explosive event."

A number of studies of drinking and crime show excess abuse--over and above intercourse--in alcohol-present situations. Rape is no exception. Although the number of cases in which alcohol is present in the offender only is small, all of them involved force against the victim. Similarly, in alcohol-involved cases, abuse was involved twice as often as in non-alcohol involved cases.

Table C-21 Alcohol Presence by Type of Rape Event

	Alcohol Present	Alcohol Absent	Total
Single Rape	27.3% (101)	72.7% (269)	100% (370)
Pair Rape	52.4% (55)	47.6% (50)	100% (105)
Group Rape	35.7% (61)	64.4% (110)	100% (171)
	(217)	(429)	(646)

Source: Adapted from Amir, 1971 p. 207.

3. Assaults

Assault covers a broad range of actions, from angry words to a near-fatal attack. In 1975 there were 484,710 aggravated assaults reported in the U.S., a rate of 227 per 100,000 population. Area rates were 255 for metropolitan areas, 192 outside metropolitan areas, and 124 for rural areas. Aggravated assaults, like other violent crime, varied by region, with the largest proportion of assaults occurring in the Southern states (see Table C-22). Most aggravated assault involved the use of a weapon. Twenty-five percent of reported assaults involved firearms, 24% a knife or other dangerous weapons. Most assaulters were men. The ratio was 7 men for every one woman committing assault in 1975.

Estimates of alcohol presence in reported assaults vary widely by study. On the average, emergency room data shows higher levels of alcohol involvement than does data from arrest records (Table C-23.) Thum et al. report 60% of injuries due to fights and assaults coming into an emergency room to be alcohol involved. The two Wolfgang-type arrest studies, Pittman, et al. and Washington D.C., show 24% and 39% of offenders to have been drinking. Comparable figures for victims in the two studies are 25% and 46%. Differences in alcohol involvement in emergency room and police case studies may, however, be a function of differing definitions of the casualty event. Assaults resulting in serious bodily injury are the subject of the emergency study (Thum et al. 1973). But only 53% of the assaults in the arrested sample (Pittman et al. 1964) resulted in serious injury to a victim since the arrest samples include "attempts" along with serious assaults. Further, the Pittman study includes only offenders while the Thum study includes aggressors and victims. The samples also differ in demographic composition.²³

Table C-22

Proportion and Rate of Violent Crimes by Region

<u>Crime</u>	<u>Number in Nation</u>	<u>Southern</u>	<u>North Central</u>	<u>Western</u>	<u>North Eastern</u>
Criminal Homicide	20,505	42%	23%	17%	18%
Rate per 100,000*	9.6	12.7	8.1	9.0	7.6
Aggravated Assault	484,710	36%	21%	22%	21%
Rate per 100,000	227.4	253.8	177.2	284.0	206.4
Robbery	464,973	25%	26%	18%	32%
Rate per 100,000	218.2	168.6	207.3	216.5	300.4
Rape	56,090	31%	25%	25%	19%
Rate per 100,000	26.3	25.8	24.1	37.6	21.0

Source: UCR, 1975.

*Based on population total = 213,124,000

Table C-23

Empirical Studies--Crime
Assault Offenders and Victims

Author, Date, Location	Sample	% Alcohol-- Offender	% Alcohol-- Victim	Alcohol Measure
<u>United States</u>				
Shupe, 1954, Columbus, Ohio	Felonious Assault 64 offenders, 251 victims	48	--	UAC
Pittman, et al., 1964, St. Louis, Mo.	241 cases of aggravated assault 237 offenders	24***	25	Police reports/ Alcohol Presence
President's Commission on Crime in D. C., 1966	131 cases of aggravated assault 121 offenders, 131 victims	35	46	Police reports/ Alcohol Presence
<u>Foreign</u>				
Tardiff, 1964, Montreal, Canada	Assault 124 offenders, 140 victims	37	25	Police reports/ Alcohol Presence
Aho, 1976, Turku, Finland	527 cases of light assaults	72	45	Police reports/ Alcohol Presence
Wasikhaugo, 1976, Mombasa, Kenya	245 cases of aggravated assault 268 offenders, 251 victims	58	58*	Police reports/ Alcohol Presence
<u>Emergency Room Studies</u>				
<u>United States</u>				
Thum, et al.,	158 male victims of fights and assaults	--	60**	BAC .01+
<u>Foreign</u>				
Schumacher, 1923, Vienna, Austria	197 assault victims	--	46	--
Verhaege, 1959, France	777 BACs taken in unknown no. of assault victims	--	76	BAC .01+
Im Oberstag, et al., 1967, Sweden	328 assault victims, BACs on unknown no.	--	4-6	BAC .01+
Ladenranta, 1973, Helsinki, Finland	56 assault victims	--	45	--
Honkanen, 1976, Helsinki, Finland	51 assault victims	--	79	BAC .01+

*"Mombasa records show that the offender and the victim had been drinking together in 143 (58.4%) of the 245 cases and alcohol was present in 63.7% of the reported cases of assault." The 58.4% used in the table definitely understates the alcohol involvement for victims or offenders. This deviation is at most 5.3%, and this is too small for concern.

**This statistic (rounded according to standard conventions) was based on a sample excluding "five males who were injured by persons under arrest or in custody while being arrested;" see Thum et al. (1973).

*** The base for percentaging was 241, rather than 257 or 251, which are more appropriate. The number of cases was the most widely used figure in the percentaging throughout the article. Other numbers were used, but inconsistently due to varying amounts of missing data. The amount of missing data in this computation was not reported, hence the most commonly referred to figure was employed. Apparently, Normandeau (1967) followed the same procedure, as did Wasikhongo (1976).

The Thum study, as compared to the Pittman study, shows a greater proportion of those involved in an assault to be young, single and middle-class. Pittman reported that 97% of the offenders in the St. Louis study were blue collar workers; the Thum study, using a different measure of social class, reported 75% of those who had been injured in a fight or assault to be lower middle or middle class.²⁴

Assaultive behavior commonly grows out of prior social interaction between men. The Washington D.C. study showed that the majority (57%) of assaults were committed by a relative or intimate acquaintance while only a fifth were committed by strangers.

Table C-24: Victim-Offender Relationship

<u>Kind of relationship</u>	<u>Percent of total</u>
Related	20.7%
Intimate Acquaintance	36.6%
Casual Acquaintance	15.3%
Known in neighborhood	8.4%
Stranger	19.0%

} 57.3%

Source: President's Commission on Crime in D.C. (1966).

No police case studies of aggravated assault distinguish drinking by victim and offender.

The Washington, D.C. study attributes assaultiveness to drinking in only 24% of the cases. The authors write, "Arguments and drinking are the principal causes of aggravated assaults. In listing factors which precipitated the 131 aggravated assaults cases surveyed, police identified arguments in 83 instances (63%), drinking in 31 (24%), jealousy in 18 (14%), parties in 5 (4%) other crimes in 4 (3%) and gambling in 3 (.2%)." ²⁵ Clearly, situations other than those in

which the problem was attributed to drinking were likely to involve the presence of alcohol since alcohol was present in the victim or the offender in nearly half of all cases, although alcohol is a principal cause of assaultive behavior was given in only 24% of the cases.

In an important comparative study of assaults in St. Louis and Mombasa, Wasikhongo shows cross-cultural variation in the social setting of assaultive behavior. While 38% of assaults in the U.S. study occurred at the residence of victim or offender, only 24% of assaults in the African study occurred at home. In contrast, 27% of the African assaults occurred in a tavern and another 27% occurred in a drinking compound. The U.S. study showed only 11% of the assaults occurring in a tavern (Table C-25).

The Mombasa data shows a direct relationship between number of drinking compounds and number of assaults (Table C-26). Even so the number of serious assaultive incidents is low, despite the fact that drinking compounds attracted between 800-1500 customers in an evening. This is attributed by Wasikhongo, to the "strong African norms, values and rules that strictly define and determine the peaceful and polite conduct that governs situations of alcohol consumption" (Wasikhongo, 1976). These data suggest that assaultiveness is less a function of the quality of interaction of the relevant actors, as Table C-24 would suggest, than it is a function of variation in the normative environment in different settings.

There is an intimate connection between homicide and aggravated assaults.²⁶ In many cases the difference is a quick phone call, in others the speed of the ambulance. Given this, alcohol estimates for homicide and assaults might be expected to be similar. However, even when comparing studies of comparable design, alcohol estimates are, overall, much higher in homicide studies than in studies of assault. The alcohol estimates for homicide are by far the most consistent in the crime data and it is noteworthy that the estimates of alcohol presence in homicide are comparable to the emergency room data of Thum et al.²⁷

As noted above the emergency room assault studies, unlike the police case studies, are samples of bodily assaults rather than assaults combined with attempted assaults. For this reason, emergency room studies should be most similar to homicide studies.

Differences in alcohol estimates in homicide and assault studies may also stem from the differential disposition of intra-familial assaults as compared to those between friends and strangers. A recent study of family assaultiveness (Bard and Zacker, 1974) shows a large proportion of police calls to be responses to family fights. These calls result in an arrest only in extreme cases. Arrest data on homicide (the most extreme assault) show that homicides are almost twice as likely as reported assaults to involve family members. These data suggest that a large number of intra-familial fights and assaults are drinking situations but are deemed unimportant by police.

Table C-25 Assaults by Place of Occurrence in Mombasa and St. Louis (in percent)

	Street	Tavern	Residence	Other	Total
Mombasa	22.0	26.9	23.7	27.4	100
St. Louis	45.6	11.2	37.8	5.4	100

Source: Wasikhongo (1976)

Table C-26 Assault Cases by Police Divisions and Drinking Compounds in Mombasa

Police division	Number of Cases	Percent of Total	Number of Drinking Compounds	Percent of Total in Drinking Compounds
Changamwe	89	36.3	4	15.1
Central	52	21.2	2	6.5
Makupa	31	12.7	1	1.2
Bamburi	27	11.0	1	2.9
Nyali	25	10.2	-	--
Likoni	21	8.6	1	1.6
Total	245	100.0	9	27.3

Source: Wasikhongo (1976)

When we turn to the alcohol-specific data on family assault we find inconclusive reports. Studies of reported assaults (e.g. Pittman and Handy) do not distinguish alcohol involvement by the relationship of the actors. But even the data specifically focused on intra-familial assaultiveness do not show a consistent picture of alcohol involvement. One study (Gelles, 1972) finds nearly half of family assaults to have alcohol present while another study reduces this to about a quarter (Gerson, 1976). Bard and Zacker report that alcohol is present in about a half of all assault cases but is responsible for the assault in fewer than 14% of the cases (see Chapter VI, Alcohol and Family Abuse).

4. Homicide

Homicide includes both criminal homicide -- the willful slaying of another (murder and non-negligent manslaughter) -- and non-criminal homicide -- justifiable homicide and death by negligence. Studies of the relationship between drinking and criminal homicide are analyzed in this report. Twenty thousand five hundred and ten criminal homicides were committed in 1975, a rate of 9.6 per 100,000 persons in the population. This rate varied from 11 per 100,000 for metropolitan areas, to 8 per 100,000 for rural areas. As can be seen from Table C-22 the greatest proportion of all homicides occur in southern states;²⁸ the rate of criminal homicides in southern states is also the highest in the U.S.. Homicide like other serious crime is a problem of the young and the poor. Forty-three percent of the victims and 63% of the offenders were under thirty. Forty-seven percent of the victims of homicide were black, and 75% were men. The majority of arrested offenders were black (54%), and 85% were men.

The relationship between alcohol and homicide is the most well-researched area in the drinking and crime literature. This is due, in part, to the fact that homicide provides the best opportunity for reliable data. Homicide has the highest clearance rates and there is almost always a known and accessible victim. Two major types of data bear on the relationship between drinking and homicide: studies of victims, which depend on the limited data collected by coroners, and studies of victims and offenders which evaluate the context of the event per se -- research which we will call case-specific. Victim studies are presented in Table C-27. The case-specific research is presented in the following section.

Victim Studies

Victim studies are an important source of data on the homicide event. They are particularly useful because of the accuracy of the alcohol measure. All of

Table C-27
 Empirical Studies--Crime
 Homicide Victims (Coroner's Studies)

Author, Date, Location	Total N	N Autopsied	% Alcohol Present	Level	Specifications
<u>United States</u>					
Joss, 1947, Minneapolis	8	8	75 ^A	.01	Full BAC reported
Gonzales, et al., 1948, New York	--	351	44	--	Alcohol presence noted
Spain, et al., 1951, Westchester Co.	8	8	87	.01	BAC range reported
Fisher, 1951, Baltimore	68	68	69	.01	BAC range reported
Wilentz, et al., 1953, New Jersey	175	175	31	.01	BAC range reported
Cleveland, 1955, Cincinnati	337	225	84	.01	BAC range reported
Metro Life, 195 ^R	--	--	14	.01	--
Baker, et al., 1971, Baltimore	84	69	58	.01	Alcohol presence noted
Deasy, et al., 1973, Detroit	795	690	50	.01	BAC range reported
Haberman, et al., 1974 New York	136	116	42	.10	BAC range reported ^B
Chief Medical Examiner, 1974, Atlanta	295	192	59	.01	Alcohol presence noted
Gerber, 1974, Cleveland	362	317	53	.01	Alcohol presence noted
Chief Medical Examiner, 1974, Miami	265	166	56	.01	Alcohol presence noted
Luke, 1974, Washington D.C.	299	299 ^C	49	.01	Alcohol presence noted
<u>Foreign</u>					
Bowden, et al., 1958, Victoria, Aust.	120	41	76	.01	Full BAC reported
Birrel, 1965, Victoria, Aust.	100	47	49	.15	Alcohol presence noted
Leroux and Smith, 1964, So. Africa	--	137 ^D	64	.02	BAC range reported
Cutler, 1971, British Columbia	--	13	54	.01	BAC range reported
Alha, 1974	30	30	57	.01	BAC range reported

^A Summary statistic calculated from 94 cases presented in the paper. See Joss (1947).

^B Only one level of BAC reported, .10 or greater.

^C Statistics taken from Harper (1976), no reported difference between N autopsied and total N.

^D 137 represents "all adult homicide victims;" there were 150 victims total.

the studies reviewed here (Table C-27) are summarized from coroner's autopsy reports. It has become a standard procedure of city/county coroners to autopsy deaths known or thought to be homicides. The estimated presence of alcohol is remarkably consistent across studies, over time, from country to country. While a few studies are far outside a common range (Spain, 1951; Metropolitan Life, 1958; Cleveland, 1955), most of the victim studies show estimates of alcohol presence of between 40% and 60%. Finnish estimates tend, overall, to be higher than those in the U.S. This may be a function of greater attention to alcohol in the homicide situation or it may reflect real differences in alcohol involvement.

Case-Specific Homicide Research

Homicide studies vary widely in depth of detail and methodological rigor. Few comparisons across studies are possible given the variation in design and content as well as inadequacies in measurement. All of the studies included in Table C-28 focus on the role of alcohol in the homicide event. Compared to victim studies, these studies are in-depth investigations of homicide. All of these studies are case-specific, but the approaches to homicide come from widely differing perspectives. Consequently, the specific focus of each piece of research differs: Cassity (1941) concentrates on the personalities of the offenders; Lanzkron (1962) limits his sample to mental patients; Wolfgang (1958) emphasizes the immediate context of the event. What is surprising is the remarkable consistency in estimated alcohol involvement. Most studies agree that alcohol is present in about 50% of homicides.²⁹ As shown below, however, homicides are most likely to occur during times and in places where drinking occurs. Thus, establishing the role of alcohol in criminal events depends on more than noting only its presence or absence. If alcohol is a contributory factor to particular kinds of violent situations, then the primary task of both theory and data is to specify clearly the nature of these situations.

Table C-28

Empirical Studies--Crime Homicide Offenders and Victims (Case Specific Research)					
Author, Date, Location	Sample	% Alcohol Involved	Alcohol Measure		
<u>United States</u> Mello Life, 1939	250 homicide cases offenders or victims	46	Inspection of police files		
Cassity, 1940, N.Y., N.Y.	200 Homicide offenders	50	Unspecified		
Harlan, 1950, Birmingham, Ala.	387 homicide offenders	58	Police reports/alcohol presence		
Shupe, 1954, Columbus, Ohio	30 apprehended offenders	83	U.A.C.		
Bensing and Shroeder, 1960, Cleveland, Ohio	454 homicide victims	49	Full BAC recorded		
Lanzkron, 1963, N.Y., N.Y.	150 mental patients	34	Determination of general intemperance		
West, 1968, Manhattan, N.Y.	100 homicide offenders	Approx. 33	Alcohol presence, police reports		
<u>WOLFGANG TYPE RESEARCH</u>					
Author, Date, Location	Sample	% Alcohol involved-- offender or victim	% Alcohol involved-- offender	% Alcohol involved-- victim	Alcohol Measure
<u>United States</u> Wolfgang et al., 1956 Philadelphia, PA.	588 criminal homicide cases 621 offenders, 588 victims	65	55	53	Victim-BAC, Offenders-Police reports/alcohol presence
President's Commission on Crime in Wash. D.C., 1966	172 criminal homicide cases 201 offenders, 172 victims	--	45	47	Police reports/alcohol presence
Criminal Justice Commission, 1967 Baltimore, Md.	578 criminal homicide cases 624 offenders, 578 victims	54	36	47	Victim-BAC, Offenders-Police reports/alcohol presence
Voss et al., 1968, Chicago	395 criminal homicide cases 429 offenders, 395 victims	54 ^A	--	--	Police reports/alcohol presence
Levy et al., 1969 Navajo reservation	43 criminal homicide cases 46 offenders, 48 victims	--	73 ^B	--	Police reports/alcohol presence
Hillis, 1974 Memphis, Shelby Co., Tennessee	372 homicide cases 50 offenders, 372 victims	68	86	75	Victim-BAC, Offender-Police reports/alcohol presence
<u>Foreign</u>					
Dervillé, 1961 Bordeaux, France	76 homicide cases offenders or victims	53	--	--	Police records
Tardif, 1964 Montreal	59 homicide cases 53 offenders, 59 victims	--	28	22	Police reports/alcohol presence
Gillies, 1965 West Scotland	70 homicide cases offenders or victims	47	--	--	Police case files
Cuthbert, 1970 London, England	70 homicide cases	50 ^C	--	--	Records of various sorts
Virkunen, 1974 Helsinki, Finland	116 homicide cases 114 perpetrators, 116 victims	79	66	68	Victims - BAC, Offenders - Alcohol Presence/Police Reports
Aho, 1976 Turku, Finland	1498 cases of homicide 1956-74	60			Police reports/alcohol measure

^A The authors used this same data in two different articles, and reported different statistics in each article. We relied more heavily on the 1968 publication cited in the bibliography, which differed 0.5% from their 1970 article in Criminology. Rounding the 1968 statistic, according to standard conventions, explains the percentage point discrepancy from the 1970 figure.

^B Calculated for those offenders for which alcohol information was obtained (n=41).

^C Obtained from the following: "Alcohol in excess. This has been a major factor in half the murders I have seen, almost all of whom lived in the North East of England."

"Criminal homicide," remarked Marvin Wolfgang, "is probably the most personalized crime in our society."³⁰ The alcohol-specific data cannot be looked at apart from this issue. In 1972, 73% of all homicides were committed against family members, friends, neighbors and acquaintances (Table C-29). Surprisingly, no data are available showing interpersonal relationship of victim and offender and alcohol. Yet, the data show that about 50% of homicides are committed at home. Of those committed at home, alcohol was present in about half of the cases. While the Wolfgang replications include rich contextual specificity on the homicide event, little analysis is devoted to alcohol involvement. The detail that is presented signals the importance of contextual analysis for interpreting the role of drinking in criminal events. All of the Wolfgang replications used in this analysis were done in large urban settings. This analysis, therefore is confined only to urban homicide.³¹

Most urban homicides are committed by men. Blacks commit homicide at a rate greatly in excess of their proportion in the population. Alcohol-present homicides, for the cities mentioned here, are no exception. In order to explore the involvement of various race-sex groups in alcohol-present homicide, the data from several studies are given in Table C-30. Across studies the most detailed information on alcohol presence is given on victims. A comparison of studies which report alcohol in the homicide situation (victim or offender) with these studies giving only alcohol in the victim shows a common pattern of involvement across race/sex cohorts. Homicides with black male victims consistently show greater alcohol involvement both in the homicide situation generally and in victims only. The proportion of alcohol-present homicides for non-white females varies considerably from study to study, the estimates ranging from 67% to 30%. Estimates of alcohol presence in homicides involving white females also vary considerably across studies. The proportion of alcohol presence in homicides with white male victims is quite stable over time and in different cities.

Table C-29

Criminal Homicide Relationships Nationally, Offenses Known,
All Years Available (1963-1972) (Percent)

Relationship \ Year	1963 ^b	1964 ^b	1965 ^b	1966	1967	1968	1969	1970	1971	1972
Family	31.0	31.0	31.0	28.8	28.2	25.7	25.2	23.3	24.7	24.3
Friends, Neighbors, and Acquaintances (<i>UCR</i> categories of "Romantic triangle and lovers' quarrels" and "Other arguments")	51.0	49.0	48.0	49.4	50.3	49.4	48.3	47.9	47.8	48.3
Non-Primary Relationships—Mostly Strangers (<i>UCR</i> categories of "known felony type" and "suspected felony type" ^a)	17.0	20.0	21.0	21.8	21.5	24.9	26.5	28.8	27.5	27.4
TOTAL	100.0 (8,500)	100.0 (9,250)	100.0 (9,850)	100.0 (10,920)	100.0 (12,090)	100.0 (13,650)	100.0 (14,590)	100.0 (15,810)	100.0 (17,630)	100.0 (18,520)

^aFelony homicide is defined in the *UCR* as "killings resulting from robberies, sex motives, gangland slayings and other felonious activities."

^bOnly rounded figures available.

Source: Curtis (1974)

Table C-30

Alcohol Presence by Race and Sex of Victim (% Alcohol Present)

Philadelphia, 1956¹ Chicago, 1968 Baltimore, 1967² Atlanta, 1974 Cleveland, 1974

Non-White Males	70 (331)	54 (223)	54 (333)	65 (167)	58 (220)
Non-White Females	67 (96)	61 (84)	30 (103)	48 (47)	38 (52)
White Males	50 (118)	46 (67)	44 (102)	58 (62)	54 (69)
White Females	44 (43)	47 (20)	32 (38)	3 (19)	27 (21)

Sources: Wolfgang (1958), Voss and Hepburn (1968), Criminal Justice Inc. (1967), Chief Medical Examiner, Atlanta (1976), Gerber (1976).

1. Philadelphia and Chicago: alcohol presence in the situation. (In victim, offender, or both.)

2. Baltimore, Atlanta, and Cleveland: alcohol presence in the victim.

In general, race and sex have both independent and interactional effects on alcohol presence in homicides.³² Comparisons across the cities presented here are confounded by variation in the alcohol measure used. Measuring the presence of alcohol in the criminal situation (as compared to measuring its presence in the victim or the offender only) increases the number of possible alcohol related events in any given study. It is to be expected, therefore, that different patterns of relationships between alcohol and other variables will emerge as a function of which measure is chosen. Interpreting the variation across cities and race/sex categories in Table C-30 is dependent on specifying which actors in criminal events were drinking before the event. This cannot be done with data which specifies only alcohol in the situation as in the Philadelphia and Chicago studies in Table C-30.

Measuring alcohol involvement by its presence in victims causes the sex-specific alcohol estimates to diverge. Fewer female than male victims appear to have been drinking. (Baltimore, Atlanta, Cleveland in Table C-30). This is not the case when alcohol is measured by its presence in the situation. Consequently, alcohol is present in the homicide situation for black female victims, because of the drinking habits of black males. Classifying homicide by alcohol presence in the situation renders the alcohol-specific data useless for interpretation since it is not clear whether the victim or assailant is the drinker.

Bringing relevant subcultural theories to bear on these data is also difficult. The literature on race and criminality is voluminous.³³ Most of the sub-cultural explanations make reference to the physiological effects of alcohol, but all fail to specify a mechanism by which the effects of intoxication, e.g. disinhibition, are mediated by subcultural values. In the absence of a specific subcultural mechanism of disinhibition, the putative physiological effects of disinhibition would be expected to apply across race-sex cohorts. While disinhibition is the concept relied on to carry most of the burden in

alcohol-related explanations, even in a strict form the concept is not testable. Diverse theories of aggression can incorporate disinhibiting mechanisms.

Contextual Characteristics

Our ability to assess the role of alcohol as a contributory factor in criminal events rests on the quality of the contextual data. The data presented here on method, location and degree of violence in homicide situations are only a beginning in understanding alcohol's role in these events.³⁴ The presence of alcohol in homicide events appears from these data to be related to weapon used, degree of violence, and victim precipitation. Determining the interrelations among these contextual variables is not possible with available data.

Weapon

Stabbing predominates in alcohol-present homicides (Table C-31).³⁵ This relationship between the presence of alcohol and weapon used appears to be the result of two factors, the over-representation of black offenders in alcohol-present homicides and the positive association between race and method of committing homicide.³⁶ The question remains whether alcohol-present homicides are more likely to occur in the home where knives are ever-present or whether homicides where alcohol is present are most likely to be committed by someone carrying a knife? This is one test of the strength of a contextual explanation as compared to an explanation based on the personal characteristics of the relevant actors. Controlling for whether the homicide occurred at home does not reduce the association between alcohol presence and method in the Philadelphia or Baltimore data (Table C-32). This suggests that if there is a contextual explanation for alcohol involved homicide events there is no single contextual explanation, since we would expect the etiology of homicides committed at home to differ from those committed elsewhere.

Table C-31

ALCOHOL AND METHOD

	<u>Philadelphia</u>		<u>Baltimore</u>	
	Alcohol Present ¹	Alcohol Absent	Alcohol Present ²	Alcohol Absent
Stabbing	44	30	47	14
Shooting	29	41	33	46
Beating	23	19	14	14
Other	5	10	6	25
TOTAL	100% (374)	100% (214)	100% (272)	100% (142)

Sources: Wolfgang (1958), Criminal Justice Commission Inc. (1967)

¹As measured in the situation

²As measured in the victim

Table C-32

ALCOHOL AND METHOD CONTROLLING FOR HOME/NOT HOME

	<u>Philadelphia</u>		<u>Not-Home</u>	
	<u>Home</u> Alcohol Present	Alcohol Absent	Alcohol Present	Alcohol Absent
Stabbing	45	33	42	28
Shooting	30	40	28	42
Beating	19	16	28	22
Other	6	12	2	8
TOTAL	100% (200)	100% (101)	100% (174)	100% (113)

	<u>Baltimore</u>		<u>Not-Home</u>	
	<u>Home</u> Alcohol Present	Alcohol Absent	Alcohol Present	Alcohol Absent
Stabbing	50	12	45	19
Shooting	30	37	36	58
Beating	10	5	16	15
Other	10	37	3	8
TOTAL	100% (125)	100% (83)	100% (147)	100% (59)

Sources: Wolfgang (1958), Criminal Justice Inc. (1967)

Increasingly homicide is committed with the use of handguns. Between 1962 and 1972 the relative proportion of shootings increased 22 percent. Insofar as alcohol is involved in homicides differentially by method, the overall relationships of alcohol and homicide could have changed for the contemporary context.

Degree of Violence

Although all criminal homicides are violent in nature, alcohol appears to add excess violence to already violent situations. Excessively violent homicides refer to those cases where there are multiple acts of shooting, stabbing or severe repeated beatings. This holds for the Philadelphia and Baltimore data; alcohol shows an especially strong relationship to excess violence in data from Helsinki (Table C-33). This relationship between excess violence and drinking holds across race and sex groups in the Philadelphia data (Wolfgang, 1958).

TABLE C-33

Degree of Violence by Alcohol (% Excess Violence)

	<u>Alcohol Present</u>	<u>Alcohol Absent</u>
Philadelphia 1956	55 (314)	45 (278)
Baltimore 1967	42 (226)	27 (23)
Navajo Indians (1969)	33 (30)	55 (11)
Helsinki 1974	71 (92)	46 (24)

Sources: Wolfgang (1958), Criminal Justice Inc. (1967), Levy (1969), Virkkunen (1974).

Victim Precipitation

Homicide is most often a crime of passion. Throughout the sometimes long chain of events leading up to the crime, both participants continually

and profoundly affect one another. Victim-precipitated homicides have been defined as "those in which the victim was the first to show and use a deadly weapon, to strike a blow in an altercation -- in short the first to commence the interplay or resort to physical violence" (Wolfgang, 1958).³⁷

TABLE C-34

Victim Precipitation by Alcohol Presence (% Victim Precipitated)

	<u>Chicago 1966</u> ¹	<u>Philadelphia 1956</u> ²	<u>Baltimore 1967</u>
Alcohol Present	44 (164)	34 (310)	49 (239)
Alcohol Absent	31 (134)	16 (278)	16 (133)

Sources: Voss and Hepburn (1968), Wolfgang (1958), Criminal Justice Inc. (1967)

¹Chicago: Alcohol in the situation

²Philadelphia and Baltimore: Alcohol presence in the victim

Victim precipitation is much more prevalent in the alcohol-present homicides than in the alcohol-absent homicides. Ideally, alcohol involvement should be measured separately for the victim, the offender and for total presence in the situation, so that the role of drinking for each actor in the situation can be analyzed. As the data show, this is not done in all studies. However, as Table C-34 indicates, homicides with alcohol present are considerably more likely to be victim precipitated, whether the presence of alcohol is measured in the homicide situation only (e.g. the Chicago study) or for the victim only (Baltimore and Philadelphia).

The process of escalation of violence in homicide situations is one about which little is known. A victim-precipitated assault or homicide could, in theory, be a function of drinking-related changes in perceptions and judgment; it could be a function of alcohol-triggered aggression on the part of the victim and/or offender; or it could be a function of fear on the part of bystanders to intercede in a situation in which someone has been drinking heavily and has demonstrated violent behavior.

Conclusion

Alcohol-specific explanations of criminal behavior must account not only for a wide variety of discrete acts -- e.g. theft, shooting one's wife, raping a stranger -- but must also account for the varying roles of participants in criminal events. Most alcohol-involved crime includes both a drinking victim and a drinking offender (Table C-35). Few are committed in which only the victim or the offender is drinking. Thus we are not looking simply at alcohol as a criminogenic factor or a victimogenic factor but also at the role of alcohol in aggressive interactions.

Crime events include many different foci for alcohol effects: 1) the victim, 2) the offender, 3) the relationship and the interactions between the two, and 4) characteristics of the event, e.g. a large crowd, the presence of a spouse's lover, the time of day. Most important alcohol theories, such as disinhibition, focus on the individual who drinks and acts, i.e. they are person-centered theories. Much of the data on criminal events is gathered with a different focus -- characteristics of the event itself. While the theoretical focus should affect what is observed, measured and explained in the event, little of the alcohol/crime literature is theoretically motivated. In many cases, for example, only "alcohol presence" in the situation is measured. This lack of specificity in measurement causes an incomplete mapping between event-

type data and theories of alcohol's effects. Specifying the effects of alcohol separately for offenders, victims, and the situation is essential if an adequate theory and data mapping is to be achieved. As these preliminary data show it is unlikely that criminal events can be explained by either event/context centered or by person-centered theories. Most criminal offenders are men, two-thirds have had one previous conviction, offenders are disproportionately poor and black. At the same time, context exerts its own influence; contextual effects are determinative in some criminal events and exert some effect in others. Effects related to time of day, the actions of the victims, the presence of alcohol, all appear to play a role in criminal events. From this we have to conclude that, individual level alcohol theories such as disinhibition or sensorimotor impairment must be refined by a group of additional individual level factors as well as event-based factors.

Clearly, not all drinking leads to criminal behavior. Forty-five percent of the adult population drinks at least once a month; only a very small proportion of these drinking occasions end with negative consequences. It is the job of theory to provide the mechanisms that take a common action such as drinking and link it to a rarer event such as crime. These mechanisms can result from refinement of individual level theories, event-based theories, or theories based on some interaction between characteristics of the event and the actors in the event.

TABLE C-35

Proportion of Violent Crime in Which Both the Victim and the Offender are Drinking

	<u>As % of Total</u>	<u>As % of Drinking Incidents</u>
Homicide	43	68
Rape	21	62
Robbery	3	21

Sources: Wolfgang (1958); Amir (1971); Normandeau (1968)

Section III-B: Alcohol in Criminal Events -- Prison Studies

The most common and oldest type of study of the role of alcohol in crime is the study of reported alcohol involvement in the crime in prison or jail populations. An early landmark of this type of study is Samuel Chipman's (1845) "Temperance Lecturer: Being Facts Gathered from a Personal Examination of All the Jails and Poorhouses of the State of New York, and of Numbers in Maine, Pennsylvania, Delaware, Ohio, Indiana, etc.: Showing the Effects of Intoxicating Drinks in Producing Taxes, Pauperism and Crime...." This investigation, in which Chipman asked the jailkeeper about the "temperance" or "intemperance" of each of the preceding year's inmates, was the source of the popular statistics of the temperance era which ascribed three-quarters of all crime to intemperance.

Studies where prisoners are asked if they were drinking or drunk when they committed the crime for which they were incarcerated are still frequently reported. The population in prison at any time is of course, a very special selection of those who have committed crimes. Apart from the selective factors we have mentioned of who gets caught and arrested, who gets prosecuted, and who gets sentenced to prison, the population incarcerated at any time will overrepresent the longer-termers, those whose crimes are for one reason or another taken especially seriously by the legal system. A prison population thus offers a very different and much more selective view of criminal events than an arrested population. While the samples from which data are drawn are defined by an event (i.e., a crime for which the prisoner was convicted) the focus of research attention is on characteristics of the offender rather than characteristics of the event. Since most prison studies measure only the presence of alcohol in the offender in the event without any other data on the event, we are left with purely associational data with few implications for understanding the role of drinking in the criminal event.

TABLE C-36
Empirical Studies--Crime
Prison Populations (Drinking in the Event)

Author, Date, Location	Sample	% Alcohol	Alcohol Measure
<u>United States</u>			
Stearns, 1925, Massachusetts	100 consecutive admissions to Mass. State Prisons convicted of homicide	34	Police reports and self reports/ "under the influence"
Frosh and Bromberg, 1939, New York	209 convicted sex offenders	14	Alcohol present at time of event
Gray & Moore, 1941, Massachusetts	928 women prisoners serving time at the Mass. Reformatory for women at Framington, Mass.	26	Self-reports/ "drunk at time of offense"
	1637 men serving sentences at Mass. State Prisons Charlestown, Mass.	35	Self-reports/"claimed to be under the influence but not drunk at time of crime"
Banay, 1942, New York	3,135 inmates, total admissions to Sing-Sing from 1938-1940.	15 ^A	Self-reports, relative, employer, police and court reports/ "intoxicated at the time of the crime" (only "primary intemperates" were investigated for drinking at the time of crime.)
	Homicide	15	
	Assault	22	
	Sex Crimes	22	
	Grand Larceny	10	
	Robbery	16	
	Burglary	19	
Other	7		
Wenger, 1944, New York	400 excessive alcoholics in State Prison	State of alcohol intoxication	Self-reports, "other reports"/ "indulged in alcoholic beverages prior to arrest"
	Murder	11	
	Manslaughter	5	
	Robbery	32	
	Sex Crimes	12	
	Acquisition Crimes	37	
	Fatal Auto/Abandonment	2	
	Arson	1	
Abrahamsen, 1950, New York	102 male sex offenders "all suffering from serious mental disturbances"	"In more than 1/2 of cases, alcohol was associated with or was precipitating cause of crime committed"	Self-reports/ "alcohol associated with or was precipitating cause of crime committed"
Winkler, Weissman & McDermaid, 1954, Brooklyn, N.Y.	163 recent inmates admitted to the prison ward psychiatric division of Kings County Hospital	14	Self-reports/"under the influence"
Baker, James, 1959, Kansas	36 males in prison for manslaughter or murder	100 ^B	Self-reports and records (Records unspecified)/ "acutely intoxicated"
California DPH, 1960, Vacaville and Chino	2325 newly convicted felons	28 intoxicated at time of crime	Self-report/"intoxicated"
	Homicide	37	
	Assault	37	
	Robbery	31	
	Burglary	30	
	Sex Crimes	37	
Grigsby, Shaw, Earl 1963, Raiford, Florida	351 men, a systematic sample (every 7th folder) obtained from files of a universe of 2457 prisoners	Inmate Version 39 Official Version 30	Self-report and official report, (official report unspecified) (figures differ, self-report vs. official report)/ "positive relationship between drinking and the commission of crime."
Gebhard, et al., 1965, Indiana and California	1278 white males imprisoned for sex offenses	20% alcohol in the event	Self report/ police report drinking at time

Table C-36 (continued)

Author, Date, Location	Sample	% Alcohol	Alcohol Measure
Cole, 1968, California	111 female homicide offenders at Calif. Institution for Women.	50	Self-reports, prior criminal records, family/friend reports, "involved with alcohol"
McCaghy, 1968, U.S.	158 male child molesters	32% alcohol in event	Self-reported drinking
U.S. Dept. of Justice, LEAA, 1974 California	9,040 Probability sample of the state correctional institutions throughout the United States	43	Self-report/alcohol involved in crimes
Globetti, Bennett, Alsikafi, 1974 Mississippi	242 males	60	Self-report/alcohol involved in crimes
Mayfield, 1972 North Carolina	307 male offenders of violent crime	58	Self-report/under the influence of alcohol at time of crime Unspecified measure -- victims intoxicated at time of crime
<u>Foreign</u>			
Maule, H.G., Cooper, J. 1966, London, England	50 men, recently discharged prisoners	55	Self-report/"alcohol played a part in committing last crime."
Scott, 1968, Great Britain	46 male and 4 female consecutive prison cases, murderers	22 ^C	Self-report/"use of alcohol at the 'material time'"
Bartholomew, Allen A., 1968, Australia	<u>648 prisoners sentenced for the first time and 1188 recidivists</u> <u>1188 recidivists</u> Violent crimes Property crimes Sex crimes Unspecified crimes <u>648 "first timers"</u> Violent crimes Property crimes Sex crimes Unspecified crimes	58% 29 37 33 69 41 53 35	Self report/drinking or drunk at the time of the crime
Hensman, 1969, London	188 male, short term recidivists	68 55	Self-report -- drunk before offense Self-report -- drunk at time of offense
Edwards, Hensman, and Pato, 1971, England	500 persons, 188 males serving sentences of 3 mos. or less 312 males serving sentences of 1 year or more	56 14	Self-report -- drunk at time of present offense Self-report -- drunk at time of present offense

A This statistic was not reported by Banay, but computed from the figures representing the 1938-1939 admissions, and the 1939-1940 group.

B "In every one of the cases here, the homicidal act was performed while the individual was acutely intoxicated." p. 270.

C "About..... 22.% of adults (20 years and older) were involved to some extent with alcohol in this series." p. 226.

Both crime and heavy drinking are concentrated among young men, and some part of the association of alcohol and crime is no doubt a matter of coincidence.

Prison studies show substantial variation in the proportion of all offenders who reported that they were drinking at the time of the crime (Table C-36). This arises from the variety of alcohol measures used, differences in samples in the aggregation of crimes, and differences among prisons. Even when type of crime is controlled (e.g. looking only at homicide) these studies show considerable variation. Scott (1968) shows 22% of convicted murders to have been drinking at the time of the crime; Wenger (1944) reports 11%; California (1960) reports 37%.

It has usually been thought that drinking is more involved in crimes against the person than in property crimes. Assaultive and sexual crimes have long been thought to be caused by the disinhibiting influence of alcohol while property crimes were viewed as requiring greater situational control. Aschaffenburg (1913) wrote of aggravated assault that, "the danger lies not in the depravity of the habitual criminal, but in intoxication: ... the characteristic manner of the crimes is such that they are all stamped as impulsive." Of thefts he writes, "Even a slight degree of intoxication makes these latter crimes (property crimes) more difficult, while it facilitates the commission of crimes ... committed with violence and brutal force." Banay in his 1942 study of prison offenders argued, about the intemperates in his sample, "the primary intemperate individual is drawn into crime not only by his need for money ... but also by the increased irritability, irascibility and pugnacity of the protracted alcoholic state together with the illusory feeling of increased vitality and relaxed inhibition that comes from intoxication."

Mayfield as recently as 1972 argued, "In this sense alcohol use is a necessary ingredient to a set which is fertile soil for the appearance of serious assaultive incidents. In the majority of the cases in the present study the

assault probably would not have occurred in the absence of alcohol use."

While the prison data tends overall to support the view that there is considerable alcohol presence in assaultive events, this data shows that there is considerable alcohol presence in other crime events as well. In the studies in Table C-36 which show alcohol involvement by type of crime (Banay, 1942; Wenger, 1944; California DPH, 1960), there is no clear division in alcohol involvement between property crimes and crimes against the person. In a new analysis of data from a national study of offenders in prison, drinking at the time of the crime varied by class of crime, but without a clear split between crimes against the person and property crimes (Table C-37). Among those who had been drinking, drunkenness at the time of the crime was no less common for property than for person crimes, despite the greater skill often presumed to be required for these crimes. These findings suggest that there are several possible alcohol explanations around criminal events, only one of which is an assaultiveness explanation. It also suggests a too easy attribution of assaultiveness to drinking. Clearly, alcohol is present in a wide variety of crime events. Some of these events are intentional and are instrumental acts in which the criminal offender has been drinking, and commits the act with knowledge of the increased risk coming from having been drinking. Other acts are spontaneous eruptions of interpersonal violence, which might or might not have occurred if alcohol had been present. While these data from prison studies are not useful in distinguishing the many roles alcohol can play in crime events, they do provide an indication of the presence of alcohol in a wide variety of crime events.

These data from prison studies are in marked contrast to data on arrested populations. The arrest data show a strong relationship between seriousness of the crime and alcohol involvement (Tables C-11, C-16, C-23, C-27), and similarly a strong relationship between personal as compared to property crime. Studies

TABLE C- 37

Proportion of Prison Offenders Drinking at Time of Crime and Proportion Drinking Moderately to Heavily at Time of Crime by Offense (Men Only)

Offense	Percent Drinking at Time of Crime	Percent Drinking Moderately or Heavily at Time of Crime	
		Moderately	Heavily
<u>Crimes Against Person</u>			
Homicide:			
Murder	53%	10%	24%
Attempted Murder	48%	9%	23%
Manslaughter	55%	11%	23%
Kidnapping	55%	8%	34%
Sex	57%	10%	34%
Assault:			
Aggravated	62%	12%	30%
Simple and undetermined	59%	11%	29%
Robbery with weapon	39%	9%	20%
Robbery without weapon and undetermined	41%	10%	19%
<u>Crimes Against Property</u>			
Burglary	47%	9%	27%
Larceny	38%	7%	23%
Motor Vehicle Theft	46%	11%	31%
Forgery	38%	12%	21%
Arson	67%	9%	39%
<u>All Other Crimes</u>	30%	8%	12%
Total	43%	9%	23%

Total Unweighted N 8711

Total Weighted N 184,949

Source: U.S. Dept. of Justice, IFAA 1975, Reanalysis

Table C-38 Proportion of Prison Offenders Drinking at Time of Crime by Number
of Prior Convictions by Worst Present Offense (Men Only)

<u>Crimes Against Person</u>	<u>Offense (Men Only)</u>			
	<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Fourth +</u>
Homicide				
Murder	51%	53%	57%	66%
Attempted Murder	49%	44%	52%	52%
Manslaughter	51%	60%	62%	70%
Kidnapping	59%	56%	54%	50%
Sex	51%	63%	58%	71%
Assault				
Aggravated	64%	54%	67%	70%
Simple and undetermined	51%	63%	57%	87%
Robberty with weapon	34%	39%	47%	51%
Robbery without weapon and undetermined	39%	38%	46%	44%
<u>Crimes Against Property</u>				
Burglary	47%	41%	50%	55%
Larceny	30%	43%	41%	46%
Motor Vehicle Theft	35%	64%	54%	53%
Forgery	30%	33%	43%	58%
Arson	60%	80%	63%	70%
<u>All Other Crimes</u>	25%	31%	34%	37%
<u>Total</u>	41%	44%	48%	53%

Total Unweighted N 8711

Total Unweighted N 184,949

Source: U.S. Dept. of Justice, LEAA, 1975, Reanalysis.

based on arrest record data show 7% of robberies (Normandeau, 1968), 24% of rapes (Amir, 1967), 24% of assaults (Pittman and Handy, 1964), and 55% of homicides (Wolfgang, 1956) to be alcohol involved.³⁹ Comparable proportions based on prison data (U.S. Department of Justice, LEAA, 1975) are 39%, 57%, 61% and 53% (Table C-37). The prison data also reveals a large proportion of burglaries (47%) and car thefts (46%) to be alcohol involved.

Differences in the patterns of relationships found in arrest records as compared to self-reports (prison studies) may be due among other things to unreliability in the alcohol measure and differences in the sample of offenders. Given the substantial delay in clearance for most crimes, reconstructing the roles of alcohol in the event for arrest records is difficult. Additionally, recent analysis of the national data on prison offenders suggests that processes of selection in the prison population toward offenders with longer criminal records, more serious offenses and longer sentences are in the direction that would show a greater proportion of offenders who are drinkers. As Table C-38 shows, offenders with previous criminal records are substantially more likely to report having been drinking at the time of the criminal event for which they are in prison. This table shows, however, that even first offenders report a level of drinking for all crimes, except homicide, substantially above that found in arrest record data. It is worth noting that the crime with the highest clearance rate -- homicide -- shows a level of estimated alcohol involvement quite close to that found in jail data. This supports the view that low estimated alcohol involvement in the jail studies for crimes other than homicide is, in large part, a function of low and delayed clearance rates as well as the greater investigative time spent on homicide cases. If, then, self-report data is accurate, it shows overall, a substantial amount of drinking during the commission of crimes, even the commission of robbery and property crimes. The literature has long supported a view of little alcohol involvement in these crimes.

A question asked throughout this analysis is the relative strength of event-oriented explanations (e.g. drunkenness at the time of the event) as compared to person-oriented explanations (e.g. drinking problems). The prison data suggests that characteristics of the event alone do not determine the patterns of criminal and drinking behavior. That is, there is no simple relationship between criminal acts and drinking. First, no type of crime shows more than 60-70% of cases to be alcohol-involved. Thus, between a third and a half of the criminal acts within each type of crime are committed by those who were not drinking. Further, were context alone determinative we would not expect to find the presence of alcohol explained by important social differentiations. We find two major sources of social variation in reported drinking involvement. As shown in Table C-39, recidivists are more likely than first-offenders to report drinking involvement, and as Table C-40 shows, whites are considerably more likely than blacks to report drinking involvement. Offenders with more prior prison convictions are more likely to report both drinking at the time of the crime and drinking heavily. Sixty-eight percent of first offenders, 73% of second offenders, and 81% of third offenders reported drinking moderately to heavily at the time of the crime. While this may be a function of more experienced offenders attempting to mitigate guilt, a number of prison studies show a fairly strong relationship between problem drinking and criminal career. Mayfield (1972), in a study of a North Carolina prison, reports a much larger proportion of problem drinkers, drinking at the time of the crime, as compared to those not reporting drinking problems.

Substantially fewer black prison offenders than whites report drinking before or during the commission of the crime (Table C-40). This is surprising given the often reported greater quantity and frequency of drinking among young blacks and the greater numbers of drinking problems. While black and white drinking involvement does not differ for murder and simple assaults, there is a consistent

Table C-39 Proportion of Drinkers Drinking Moderately/Heavily at Time
of Crime by Number of Prior Convictions by Worst Present Offense (Men Only)

	<u>Offense (Men Only)</u>							
	<u>First</u>		<u>Second</u>		<u>Third</u>		<u>Fourth +</u>	
<u>Crimes Against Person</u>	<u>Mod.</u>	<u>Hvy.</u>	<u>Mod.</u>	<u>Hvy.</u>	<u>Mod.</u>	<u>Hvy.</u>	<u>Mod.</u>	<u>Hvy.</u>
<u>Homicide</u>								
Murder	18%	40%	16%	54%	17%	62%	27%	43%
Attempted Murder	23%	44%	16%	63%	0%	60%	18%	31%
Manslaughter	17%	41%	18%	39%	17%	61%	48%	33%
Kidnapping	20%	44%	5%	77%	15%	71%	15%	71%
Sex	18%	61%	20%	47%	12%	67%	18%	70%
<u>Assault</u>								
Aggravated	15%	48%	25%	43%	30%	50%	17%	57%
Simple and undetermined	13%	58%	19%	45%	24%	39%	29%	48%
Robbery with weapon	26%	45%	21%	52%	19%	70%	20%	57%
Robbery without weapon and undetermined	25%	46%	26%	33%	29%	43%	24%	46%
<u>Crimes Against Property</u>								
Burglary	21%	49%	15%	67%	11%	64%	22%	60%
Larceny	15%	59%	21%	54%	27%	65%	13%	68%
Motor Vehicle Theft	28%	58%	21%	71%	23%	67%	32%	69%
Forgery	33%	47%	39%	50%	38%	51%	25%	67%
Arson	14%	67%	12%	52%	0%	49%	20%	61%
<u>All Other Crimes</u>	25%	35%	26%	42%	28%	46%	25%	41%
Total	21%	47%	20%	53%	20%	60%	23%	55%

Source: U.S. Dept. of Justice, LEAA, 1975, Reanalysis.

Table C-40 Proportion of Prison Offenders Drinking at
Time of Offense by Race by Worst Present Offense

Worst Present Offence	White Males		Percent Been Drinking Black Males		Total Males	
	N	%	N	%	N	%
Murder	5079	54.8	5394	50.1	10811	52.8
Attempted murder	1034	61.3	990	38.9	2088	48.4
Manslaughter	1762	60.6	2397	51.4	4260	55.1
Kidnapping	955	60.6	224	39.2	1220	55.2
Sex	4168	62.9	2629	49.3	6919	57.0
Aggravated assault	1894	71.7	1269	50.6	3311	62.2
Assault, simple and undetermined	883	58.5	749	55.5	1781	58.8
Robbery with weapon	5691	52.9	5238	30.3	11113	38.9
Robbery without weapon	2484	55.8	2850	32.0	5504	40.5
Burglary	10710	51.7	5054	38.0	16241	46.8
Larceny	2633	40.6	1581	30.9	4491	37.5
Auto theft	1289	52.6	232	26.7	1564	46.0
Frogery	2345	44.2	542	24.1	2887	38.0
Arson	503	70.2	122	52.9	647	66.7
Other	5491	33.9	2437	22.7	8254	29.9

Source: U.S. Dept. of Justice, LEAA, 1975, Reanalysis.

difference on most other crimes. Whites are almost twice as likely to have been drinking when committing a robbery as compared to blacks, and are more likely to have been drinking when committing an aggravated assault. Further, whites, overall, show a high and fairly stable proportion of drinkers across type of crime while blacks show considerable variation by type of crime. Thus, 55% of the white offenders committing homicide and 53% of the white offenders committing robbery report drinking at the time of the crime. Comparable proportions for blacks are 50% and 30%.

Some of these differences in alcohol involvement between races and across crimes are due to the proportions of previous offenders included in the sample of offenders. Controlling for prior arrests explains some of the race differences in alcohol involvement. Of the robberies committed by blacks, 20% were committed by offenders with three or more prior convictions, while the figure for whites is 33%. However, as Table C-41 shows, independent of race, robbery offenders with prior convictions are likely to report drinking involvement. The relationship is stronger for white than black offenders. Thus, although some of the differences in alcohol involvement by race can be explained by the greater proportion of drinkers among these offenders, there still remains a substantial racial difference in reported drinking.

A number of studies support the view that blacks are less likely than whites to have been drinking at the time of the crime and are less likely to have drinking problems. The findings from several studies are reported in Table C-42.

Table C-41

Reported Drinking of Robbery Offenders at the Time
of the Crime by Previous Convictions and Race

	<u>Previous Convictions</u>			
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
% Black Offenders Drinking	29	34	29	38
% White Offenders Drinking	47	48	68	61

Source: U.S. Dept. of Justice, LEAA, 1975, Reanalysis.

Table C-42

Drinking Involvement of Black and White Offenders (Selected Studies)

AT THE TIME OF THE EVENT

Grigsby (1963)	32% of whites drinking, intoxicated at time of crime compared to 26% of non-whites
Mayfield (1977)	60% of whites drinking, intoxicated at time of crime compared to 53% of blacks
LEAA (1974)	50% of whites drinking at time of crime compared to 37% of blacks.

DRINKING PATTERNS/DRINKING PROBLEMS

Grigsby (1963)	43% whites are "regular drinkers" as compared to 39% nonwhites
Globetti (1974)	56% whites are "regular drinkers" as compared to 34% of blacks
California (1959)	30% of white offenders and 16% of black offenders report drinking problems
Guze (1962)	47% of whites labelled alcoholics; 27% of blacks

Section III-C: Drinking History and Drinking Problems -- Prison Studies

Prison-based research on the drinking problems and histories of criminal offenders is organized around two agendas. One agenda centers on finding the common correlates of criminal behavior. This research tends to be multifactorial and eclectic. In addition to the role of alcohol, criminologists since Lombroso have looked at such diverse effects on criminal behavior as heat, geology, skin color, head shape, race and education. A second agenda, the agenda of those specifically concerned with alcohol problems, centers on identifying the negative consequences of drinking or drinking problems. A common feature of both types of research is to identify both crime and drinking problems as moral failings of the individual rather than as consequences of situational attributes of an event or of general socio-cultural factors. Most contemporary studies (Grigsby, 1963; Globetti, 1974; Mayfield, 1972; California DPH, 1960) which explore the alcohol-related problems of offenders spend little effort investigating characteristics of the criminal event for which respondents are incarcerated or major life problems other than drinking. These studies of alcohol problems in criminal populations bring a specific alcohol agenda to the work that displaces the eclectic approach of early criminological research.

As Table C43 clearly indicates the proportion of problem drinkers in a prison population is a function of the definition of drinking problems which is used. A good part of the variation is also very likely a function of the differences in catchment from one prison to another. Gibbens and Silberman (1970) report dramatic differences in the proportion of "excessive drinkers" in three English prisons. The largest proportion of excessive drinkers was found in Pentonville prison -- a prison for recidivists (see Table C-43a).

Table C-43

Empirical Studies--Crime
Prison Populations (% Problem Drinkers)

Author, date, location	Total N	% problem drinkers	Alcohol measure
Frosh and Bromberg, 1939, New York, New York	709 convicted sex offenders	5 chronic 7 periodic 31 moderate	Alcoholism
Shaskan, 1939, New York, New York	100 male sex offenders	6%	Alcoholic psychosis
Gray and Moore, 1941 Massachusetts	2565 1637 Males 928 Females	-- 66 49	Labelled alcoholics, records of the Massachusetts Department of Corrections
Banay, 1942, New York, New York	3135	22	"Primary intemperates"--physical, laboratory, psychometric, and psychiatric examinations, statements were checked with family and personal histories available from objective sources.
Apfelberg et al., 1944, New York, New York	242 cases non-psychotic sex offenders examined at Bellevue	18	Excessive drinkers
Wenger, 1944, New York, New York	1900	22	"Intemperates" -- self-reported drinking problems
Winkler et al., 1954, Brooklyn, New York	(control) ^f 1118 (sample) 163	39 45 20	Signs of alcoholism Signs of alcoholism Primary alcoholics--no gross psychopathic, neurotic or criminal tendencies; in whom compulsive drinking is the most obvious symptom; and in whom antisocial behavior is found only in connection with excessive alcohol consumption.
Ellis and Brancale, 1956 New Jersey	300 convicted sex offenders	32	Alcoholism
Glueck, 1956, New York New York	193 convicted sex offenders	11 50 39	First figure is severe alcoholism--marked alcohol-related problems; second figure is moderate alcoholism--some alcohol-related problems.
California DPH, 1959, Los Angeles County	134	24	Self report/"Drinking Involved"
California DPH, 1960, California	2257	29	Answered yes to question: "In general, has the use of alcoholic beverages been a problem in your life in any way?"
Guze, et al., 1962 Missouri	223	43	"43% considered to be suffering from alcoholism" based on "symptoms emphasized by Jellinek"
Grisby, 1973, Raiford, Florida	351	43	Self-report: Regular drinker
Gebhard, et al., 1965 Indiana and California	2446	14	White males imprisoned for sex offenses. Habitual use of alcohol so that is seriously interferes with social and employment relations, or equivalent of one-fifth whiskey daily
Ward, 1969 California	832 (1963) 200 (1968)	9 18	Labelled "alcoholics," unspecified criteria
Mayfield, 1972 North Carolina	307	36	Problem drinkers according to (1) self-report, (2) prior diagnosis of alcoholism at medical facility, (3) admission to a facility for treatment of alcoholism. Other evidence consisted of conviction for public drunkenness or driving while intoxicated.
Globetti et al., 1974 Mississippi	242 242	60 40	"Excessive drinkers," self-report. Three or more personal and social complications as a result of drinking.
<u>Foreign</u>			
Maule and Cooper, 1966 London, England	50	56	"Heavy drinkers" self-report.
Smith-Morehouse, 1966 Flockton, England	100	47	"Problem Drinkers," the sum total of the categories "Excessive Heavy Drinking," "Prealcoholics," "Alcoholics." Each of the above classifications obtained from Jellinek's WHO Tech. Report, No. 48, on symptoms of alcoholism.

Table C-43 (continued)

Author, date, location	Total N	% problem drinkers	Alcohol measure
Tripkovic, 1967 Sremska Mitrovica, Croatia	1808	42	Alcoholics: "those excessive drinkers whose dependence upon alcohol has attained such a degree that it shows a noticeable mental disturbance or an interference with their bodily and mental health, their interpersonal relations, and their smooth social and economic functioning or who show predominant signs of such development"
Bartholomew, 1968 Australia	1836	18	Chronic alcoholics, criteria unspecified.
Scott, 1968 --	50	8	"Chronic alcoholics," unspecified criteria.
Hensman, 1969 London, England	188 188	46 33	Felt drinking was a problem. Showed evidence of chemical dependency.
Gibbens and Silberman, 1970 London, England	404	18	Admitted excessive drinking to the extent that it interfered seriously with their social adjustment.
		22	Previous convictions for drunkenness.
Edwards, et al., 1972, London England	188	43	Self-reported drinking problems
Nicol, et al., 1973, England	89 ^F 89	38 28	Any alcoholism (including dependence). Physical dependence--reported having amnesic attacks, tremors, hallucinations, or morning drinking or who were classified as 2 or 8 alcoholic according to Jellinek's criteria
Edwards, et al., 1976, London England	188 188 188	44 21 33	(0) (1) (3/4)
			Alcohol Dependence Scale constructed, based on affirmative answers to two questions. Scale range from 0-low to 4-high.

^f The control group: the male non-prisoners discharged from the psychiatric division of Kings County Hospital, 10/1/51 - 12/31/51. The sample: male prisoners admitted to the prison ward of the psychiatric division in the same three month period.

Proportion of "Excessive Drinkers" in
Several English Prison Populations

Buxton (first offenders)	27%
Eastcherich (maximum security)	17%
Pentonville (recidivists)	47%

Source: Gibbens and Silberman, 1970.

The same relationship between catchment and prevalence of drinking problems exists in the U.S. (Bartholomew, 1968; Edwards et al., 1971).

Few studies define drinking problems with enough specificity to compare against measures used in general population data, but several approximate such measures. Mayfield categorized a prisoner as a problem drinker: "if the subject acknowledged that he was an excessive drinker, a problem drinker or an alcoholic he was categorized as a problem drinker." A prisoner was also categorized as a problem drinker if he had recent treatment for alcoholism or had been convicted of public drunkenness or DUI. Thirty-seven percent of the prison population was defined as having drinking problems. Globetti found that 40% of the prisoners in his Mississippi study had experienced "three or more personal and social complications as a result of drinking." A California study found that 29% of "recently admitted" male prisoners responded "yes" to the question, "In general has the use of alcoholic beverages been a problem in your life in any way?" When these data are compared to roughly comparable measures in the general population, it is clear that prisoners have a greater incidence of drinking problems than is found in the general population.

Table C44 shows the proportion of men who are problem drinkers as measured by self labels and objective measures in a national sample of American men. Only 2.5% of the sample chose the label "alcoholic" or "problem drinker,"

Table C44. Comparison of Drinking Problems in Two Prison Samples with
Drinking Problems in a National Sample of Men

North Carolina Prison (Mayfield, 1972)

37% of the sample
had one or more
indication of
problem drinking

13% label self
excessive drinker,
problem drinker or
alcoholic.
5% received treatment
for alcoholism
25% had been con-
victed of drunkenness
or DWIL

General Population Samples of Men

2.5% label self alcoholic
or problem drinker**
2.5% label self as ex-alcoholic
or problem drinker**
4% yes to "Have you ever been
treated or had counseling for
any drinking problem?"***
28% yes to "Were you ever ar-
rested for drunk driving" or
"Have you ever gotten into any
other kind of trouble with the
law because of anything connect-
ed with drinking or with alcohol
(aside from drunk driving
arrests)?" ****
14% yes to "Did drinking ever
cause you to have an accident
or injury of some kind --
either at work, at home, on the
street, or someplace else?" ***

Mississippi Prison (Globetti, 1974)

40% -- three or more personal and social
complications as a result of drinking.

General Population Samples of Men

29% -- high current or high
past problems (respondent
reported relatively severe
problems in at least two of a
dozen problem areas or seven or
more mild problems associated
with drinking on Cahalan/Room
"Overall Problem Score," (see
Cahalan and Room, 1974, pg. 27).
(National Sample of Men, 1973)

* Only men 40 and under were included here in order to afford greater
comparability with these prison samples.

** Roizen, R. 1974. (National Sample of Men, 1973)

*** Cahalan and Treiman, 1976, Table 20.

**** Reanalysis of 1967 San Francisco Sample, Men aged 21-59 described
in Cahalan and Room, 1974.

although another 2.5% label themselves as formerly one of these. A much larger proportion of prisoners reported that they believed themselves to be problem drinkers or alcoholics (Mayfield, 1972).

Clearly this sort of comparison hangs on the quality and comparability of the measures in the two types of populations. A general measure such as "has alcohol ever been a problem in your life" or one which includes, for example, alcohol related arrests inflates the proportion of problem drinkers in either population. Only a small proportion of both samples reported having received treatment for alcohol problems.

An overall drinking problems score shows up a large proportion of drinking problems in both the general and the prison populations. As Table C-44 shows, 29% of the men in a general population sample show high current or high past problems (Cahalan and Room, 1974).

While the California and the Globetti prison studies show still larger proportions of men with drinking problems, the differences are not as great as might be expected. Forty percent of the Globetti sample reported three or more personal and social complications as a result of drinking. Thirty-three percent of the California prison sample reported five or more problems, 13% reported six or more problems, based on the following measures:

1. Have you ever used alcoholic beverages?
2. In the last two years, have you had any wine, beer or hard liquor?
3. Have you ever been drunk?

4. Were you ever in an accident of any type after you had been drinking?
5. Have you ever been booked or arrested on any type of drinking charge such as drunk driving, drunkenness, drunk and disorderly, vagrancy drinking, etc.?
6. Were you ever treated or hospitalized for drinking?
7. When you are worried or troubled do you drink more, less, or about the same?⁴⁰

Unfortunately, there is no adequate study of the alcohol problems of prisoners which looks in detail at the affect of alcohol on areas of life other than the criminal career areas such as job, family and health.

Although prisoners report more drinking problems than the general population, this does not mean that the drinking problems of offenders are causally related to their crime problems. People serving time in prison appear to have more of many kinds of problems than those in the general population. A recent U.S. study of prison offenders (U.S. Department of Justice, LEAA, 1975) indicates that 60% of the prisoners have not finished high school; over 25% are divorced or separated; 31% were unemployed prior to prison; 70% had served at least one other sentence. A second large prison survey also shows a multi-problem population. Eighty-seven percent of the offenders in the California study (1959,1960) had at least one prior jail or prison commitment and as Table C45 shows nearly a fifth had been committed to prison two or more times. Of these offenders, 37% were divorced or separated and almost a fifth scored below normal on the Army General Classification Test or Wechsler Bellevue test.

Table C-45 Number of Prior Commitments in a Sample of
Male Prison Offenders (California, 1959 - 1960)

None	13%
Jail or Juvenile	52%
One or Two	64%
Three or More	36%
One Prison	18%
Two or More Prison	17%

Source: California Department of Public Health (1960)

Evidence does show that problem drinkers in the prison population have a larger proportion of many of these problems than other prisoners. A recent English study showed drinkers to be less likely than non-drinkers to have had regular employment and be in contact with family (Gibbens and Silberman, 1970). Problem drinkers also show higher rates of recidivism and higher rates of assaultiveness. Mayfield reports from his study:

"Problem drinkers had past histories of more difficulties of all kinds when compared to other subjects. Problem drinkers more often had a previous criminal record (67% exclusive of status offenses) and more often had committed previous assaults (50%) than non-alcohol subjects (32%). The majority of problem drinkers had alcohol offense arrests (70%) and most of these also has been convicted of other crimes. A total of 63% of problem drinkers had been imprisoned previously."

Guze et al. (1962, 1968) found that almost twice as many "alcoholics" as other offenders reported fighting which led to trouble before age eighteen.

Few prison studies include any detailed analysis of characteristics of the drinking population. The California study compares problem drinkers with the non-problem population on a number of characteristics. As Tables C-46 and C-47 show, the problem

Table C-46

ETHNIC GROUP
 BY PROBLEM AND NONPROBLEM DRINKING GROUPS
 Criminal Offenders and Drinking Involvement Study, 1959

ETHNIC GROUP	STUDY GROUP				
	Both Groups	Problem Drinking		Nonproblem Drinking	
		Number	Percent	Number	Percent
All Groups	2,257	675	100.0	1,582	100.0
White ¹	1,378	486	72.0	892	56.3
Mexican	342	89	13.2	253	16.0
Negro	492	83	12.3	409	25.9
Other ²	44	17	2.5	27	1.7
Unknown	1	-	-	1	0.1

¹ Includes Puerto Rican, Hindu, West Indian.

² Includes Indian, Chinese, Japanese, Filipino, Hawaiian, Korean, Samoan.

Note: Percents adjusted to add to 100.0.

Source: State of California, Department of Corrections, Commitment Records.
 State of California, Department of Public Health, Division of Alcoholic Rehabilitation, Interview Records.

Table C-47
 AGE AT ADMISSION
 BY PROBLEM AND NONPROBLEM DRINKING GROUPS
 Criminal Offenders and Drinking Involvement Study, 1959

AGE AT ADMISSION	STUDY GROUP				
	Both Groups	Problem Drinking		Nonproblem Drinking	
		Number	Percent	Number	Percent
All Ages	2,257	675	100.0	1,582	100.0
16-24	732	138	20.5	594	37.6
25-29	486	135	20.0	351	22.2
30-34	386	124	18.4	262	16.6
35-39	242	84	12.4	158	10.0
40-44	171	84	12.4	87	5.5
45-49	101	47	7.0	54	3.4
50-54	68	33	4.9	35	2.2
55-59	36	21	3.1	15	0.9
60 and Over	35	9	1.3	26	1.6
Median Age	29.1	32.6		27.8	

Note: Percents adjusted to add to 100.0.

Source: State of California, Department of Corrections,
 Commitment Records.
 State of California, Department of Public Health,
 Division of Alcoholic Rehabilitation, Interview
 Records.

Table C-48

OFFENSE BY PROBLEM AND NONPROBLEM DRINKING GROUPS
Criminal Offenders and Drinking Involvement Study, 1959

OFFENSE ¹	STUDY GROUP				
	Both Groups	Problem Drinking		Nonproblem Drinking	
		Number	Percent	Number	Percent
All Offenses	2,257	675	100.0	1,582	100.0
Crimes Against Persons					
Homicide	71	22	3.3	49	3.1
Robbery	330	90	13.3	240	15.2
Assault	67	25	3.7	42	2.7
Crimes Against Property					
Burglary	454	121	17.9	333	21.0
Theft (except auto)	133	33	4.9	100	6.3
Auto theft	93	42	6.2	51	3.2
Forgery and checks	432	181	26.8	251	15.9
Sex Offenses	141	49	7.3	92	5.8
Narcotics Offenses	392	59	8.7	333	21.0
Other Offenses	144	53	7.9	91	5.8

¹ See Appendix, p. 71 for detail of offense groups.

Note: Percents adjusted to add to 100.0.

Source: State of California, Department of Corrections, Commitment Records.
State of California, Department of Public Health, Division of Alcoholic Rehabilitation, Interview Records.

Table C-49a

OFFENSE BY NUMBER OF PRIOR COMMITMENTS
PROBLEM DRINKING GROUP

Criminal Offenders and Drinking Involvement Study, 1959

OFFENSE	TYPE OF PRIOR COMMITMENT				
	All Types	No Prior Commitment	Prior Jail or Juvenile	One Prison	Two or More Prison
	PERCENT				
All Offenses	100.0	100.0	100.0	100.0	100.0
Crimes Against Persons					
Homicide	3.3	6.9	3.5	3.4	1.3
Robbery	13.3	22.4	15.5	11.9	6.3
Assault	3.7	6.9	5.6	1.7	-
Crimes Against Property					
Burglary	17.9	8.6	17.3	16.1	24.0
Theft (except auto)	4.9	-	3.2	4.2	10.8
Auto theft	6.2	-	5.9	7.6	8.2
Forgery-and-checks	26.8	19.0	24.0	30.6	32.9
Sex Offenses	7.3	22.4	6.2	5.9	5.1
Narcotics Offenses	8.7	8.6	10.0	12.7	3.2
Other Offenses	7.9	5.2	8.8	5.9	8.2

Table C-49b

OFFENSE BY NUMBER OF PRIOR COMMITMENTS
NONPROBLEM DRINKING GROUP

Criminal Offenders and Drinking Involvement Study, 1959

OFFENSE	TYPE OF PRIOR COMMITMENT				
	All Types	No Prior Commitment	Prior Jail or Juvenile	One Prison	Two or More Prison
	PERCENT				
All Offenses	100.0	100.0	100.0	100.0	100.0
Crimes Against Persons					
Homicide	3.1	7.0	2.5	2.4	1.8
Robbery	15.2	21.3	16.9	7.6	11.9
Assault	2.7	3.3	2.3	2.1	4.1
Crimes Against Property					
Burglary	21.0	9.4	20.6	25.5	29.6
Theft (except auto)	6.3	6.1	4.8	7.2	11.0
Auto theft	3.2	0.4	3.6	4.5	3.2
Forgery-and-checks	15.9	14.8	14.5	17.6	20.1
Sex Offenses	5.8	15.2	5.0	4.5	0.5
Narcotics Offenses	21.0	17.2	23.8	24.8	10.0
Other Offenses	5.8	5.3	6.0	3.8	7.8

Note: Percents adjusted to add to 100.0.

Source: State of California, Department of Corrections, Commitment Records.
State of California, Department of Public Health, Division of Alcoholic Rehabilitation, Interview Records.

drinking group on average was older. drinkers were more likely to be divorced.

Additionally, problem

Problem drinkers show marked difference in criminal behavior. As might be expected, a smaller proportion of problem drinkers had committed narcotic offenses, while a substantially greater proportion of drinkers (see Table C-48) were incarcerated for forgery and checks. It is noteworthy, too, that crimes against the person, i.e., more violent crimes, were not more prevalent among problem drinkers. Tables C-49a and b offers some suggestive evidence on the nature of criminal and drinking careers. Problem drinkers with one or more prior committment were most likely to have been arrested for forgery or checks or burglary. Problem drinkers with no prior commitments were most likley to be arrested for violent crimes. Although previous offenders tend generally to commit crimes of economic gain the pattern is strongest among problem drinkers. It is likely that the combination of drinking problems and prior convictions makes any legitimate occupation a near impossibility.

Table C-50 Drinking/Drugs at Time of Event By Drinking History

	<u>Sober</u>	<u>Drinking</u>	<u>Drunk</u>	<u>Drugs</u>	<u>Total</u>
Non-Drinker	100				100
Drinkers	37	30	30	2	99
Problem Drinkers	20	19	57	3	99

Source: Reanalyses of data described in Mayfield, 1972.

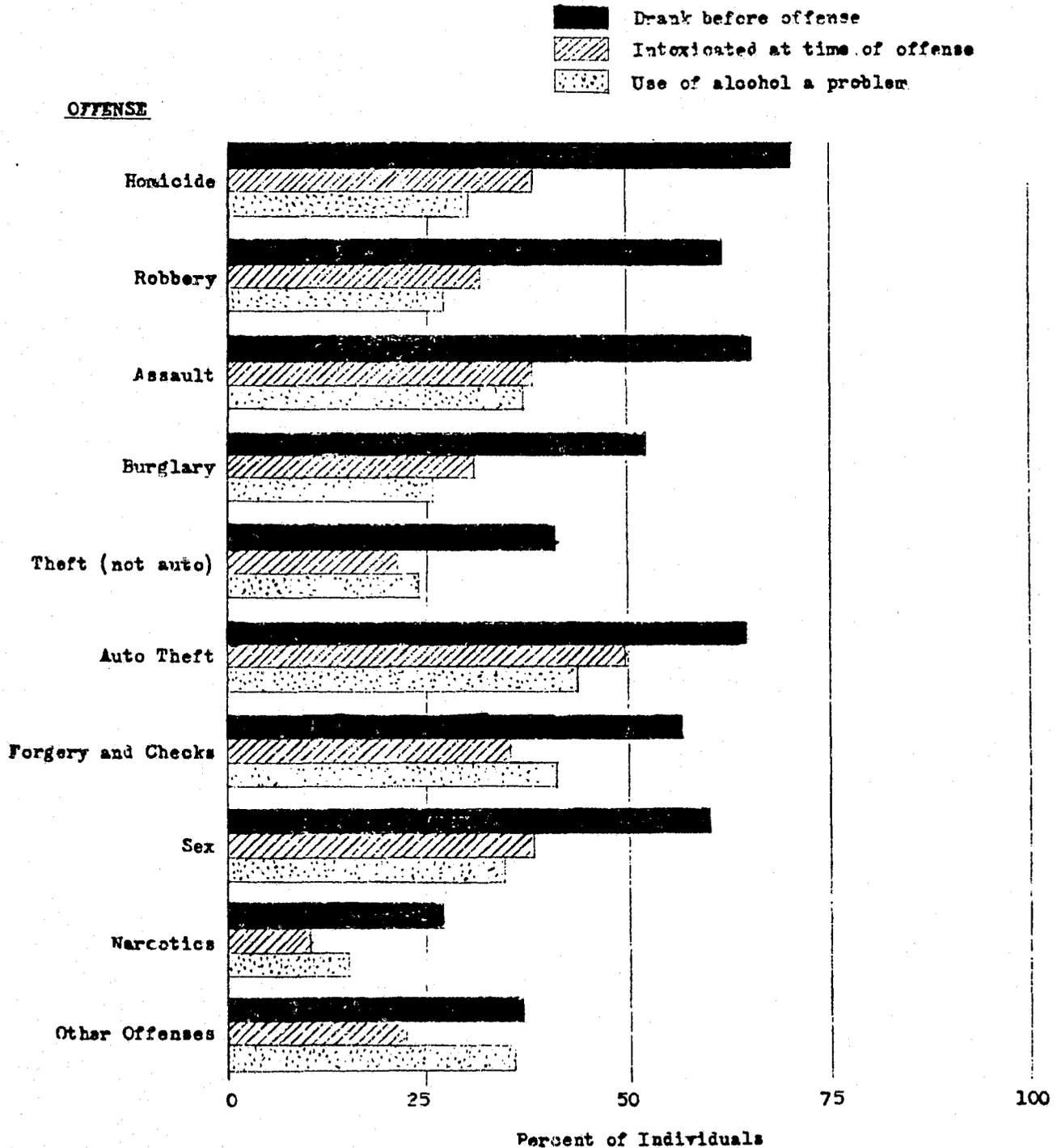
Several studies show that a significantly greater proportion of problem drinkers had been drinking prior to the crime for which they were incarcerated when compared to other offenders. Mayfield reports that problem drinkers were twice as likely to have been drunk prior to arrest (Table C-50). The California study reports that 80% of the problem drinkers, as compared to 38% of the non-problem group, were drinking at the time of the crime.

It is, of course, possible that those who drank before the crime or those who label themselves problem drinkers try to manage a drinking identity by responding positively to all the drinking items. As Chart A shows, however, many more offenders report drinking before the crime than report either intoxication or drinking problems. See Roizen (1977) for a lengthier discussion of these issues.

The relationship between drinking at the time of the event and drinking history (long term effects) is relatively unexplored in the alcohol/crime literature. The literature on suicide among alcoholics, where data exists on this issue, shows a substantially increased probability of drinking at the time of the event among alcoholic suicides when compared to those not labelled alcoholics (see Chapter Five).

Chart A

PERCENTS OF INDIVIDUALS IN SELECTED CATEGORIES OF CRIME WHO DRANK BEFORE THE OFFENSE; WHO WERE INTOXICATED AT TIME OF OFFENSE; AND WHO CLAIMED AN ALCOHOL USAGE PROBLEM
CRIMINAL OFFENDERS AND DRINKING INVOLVEMENT STUDY POPULATION, 1959



Source: California Dept. of Public Health, 1960.

A Note on Cross-National Comparisons

Many of the studies presented here are foreign studies. Caution must be used in making any cross-national comparisons, given variations in legal systems, drinking patterns, reporting conventions, and the prevalence of criminal activity. Two examples of significant differences in cross-cultural patterns of drinking problems and criminal behavior can be found using Bartholomew's (1968) study.

Bartholomew's data from an Australian prison sample is some of the most carefully gathered data in the crime literature (despite the unfortunate combination of an event-alcohol measure and a drinking history measure into one measure). His work shows a strong relationship between drinking and type of crime. In his study, offenders committing crimes against the person were much more likely to have been drinking or to have drinking problems when compared to offenders committing property crimes (Table C-51). The difference shown here is much greater than that found in U.S. studies. Additionally, he finds that the prison population is older than comparable alcoholic populations -- a finding that is at odds with U.S. prison/alcoholic population comparisons.

Table C-51

Alcohol Involvement of First-Time Offenders and
Recidivists by Type of Crime

					Total
	<u>Chronic Alcoholic</u>	<u>Under the Influence</u>	<u>Drinking Near the Event</u>	<u>No Drinking</u>	<u>% Drinking or chronic alcoholics</u>
Property					
First Offense	8%	19%	23%	51%	49%
Recidivists	18%	24%	13%	45%	55%
Person-Aggression					
First Offense	9%	50%	19%	22%	78%
Recidivists	28%	46%	13%	14%	86%
Person-Sexual					
First Offense	7%	37%	16%	40%	60%
Recidivists	11%	23%	11%	55%	45%
Miscellaneous					
First Offense	30%	13%	22%	35%	65%
Recidivists	43%	15%	14%	29%	71%
Total (All Crimes)	18%	26%	16%	41%	59%

Source: Recalculation of data presented in Bartholomew, 1968.

Section III-D: Criminal Careers of Labelled Alcoholics

Chronic inebriate offenders, excessive drinkers, and alcoholics in treatment have records of criminal behavior far in excess of those expected in a sample of the general population. The evidence suggests that this is a function of the cumulation of social problems in particular individuals as much as evidence of a causal relationship between "alcoholism" or problem drinking and criminal behavior. Thus, men convicted of serious offenses may be part of a skid-row sub-culture as much because of their inability to find work or their general hopelessness as because of their proclivity to drink.

Several detailed studies examine the criminal careers of labelled alcoholics. One important study of inebriate offenders found 3,078 arrests in a sample of 186 men. Seventy-seven percent of these arrests were for public intoxication. The mean number of arrests on charges other than public intoxication was 3.7. Table C-53 shows this distribution across crimes. Of the offenders in this sample, 37% had been charged with a serious offense, e.g. crimes of homicide, rapes, assault, theft, burglary. What is noteworthy, however, is that 31% of this sample had a criminal record which included only arrests for public intoxication and 32% had a criminal record of public intoxication and other alcohol-related or minor offenses. Thus even in a sample of chronic inebriate offenders only a third of the sample had a criminal history which included serious crime. This is a consistent finding both in the U.S. and abroad (Drew, 1961; Lindelius and Salum, 1973).

Recent work on the criminal careers of labelled alcoholics suggests that variation in level of criminal involvement is a function of the definition of alcoholism which is used. If the severity of alcoholism is defined in medical terms with symptoms ranging from tremulousness only to hallucinations, disorientation and deliriousness there is no evidence of a greater incidence

of criminal behavior among those with more severe symptoms. However a study which varied the definition of alcoholism on social criteris showed dramatic differences in the incidence of arrests for serious crime across the study groups. Comparing a clinical population admitted on a voluntary basis, a group of men hospitalized for acute consequences of excessive drinking and a group of homeless men investigators found that 11%, 42%, and 77% of the respective groups had criminal records. Among those men with criminal records, 87% also were registered for drinking offenses. However, among those men registered for drunkenness offenses only 57% had a criminal record (Lindelius and Salum, 1975).

The mapping of populations of alcoholics or chronic drinkers and criminal offenders is by no means perfect. As Tables C-43 and C-52 show, the majority of criminal offenders do not have drinking problems and the majority of alcoholics have not committed serious crimes. Yet the prevalence of drinking problems in criminal populations far exceeds that in the general population as does the prevalence of criminal careers in the alcoholic population. Chronic drinkers are more likely to have been drinking or to be intoxicated at any time, are more likely to be known to the police and may be less likely to be able to escape from a criminal event; the relationship of "alcoholism" and crime will include these effects. Several types of other explanations for an "alcoholism"/crime relationship exist. All are tentative. Among the physiological explanations are brain damage, hypoglycemia and REM-sleep deprivation (Pernanen, 1975). The socio-psychological literature converges on developmental explanations for both drinking problems and criminal behavior. Goodwin et al. (1971) found that alcoholics in a criminal population showed earlier manifestations of deviance on a number of criteria than did non-alcoholics. Robins (1966) showed that sociopathic children were more likely, as adults, to manifest patterns of excessive drinking, arrests, and incarcerations.

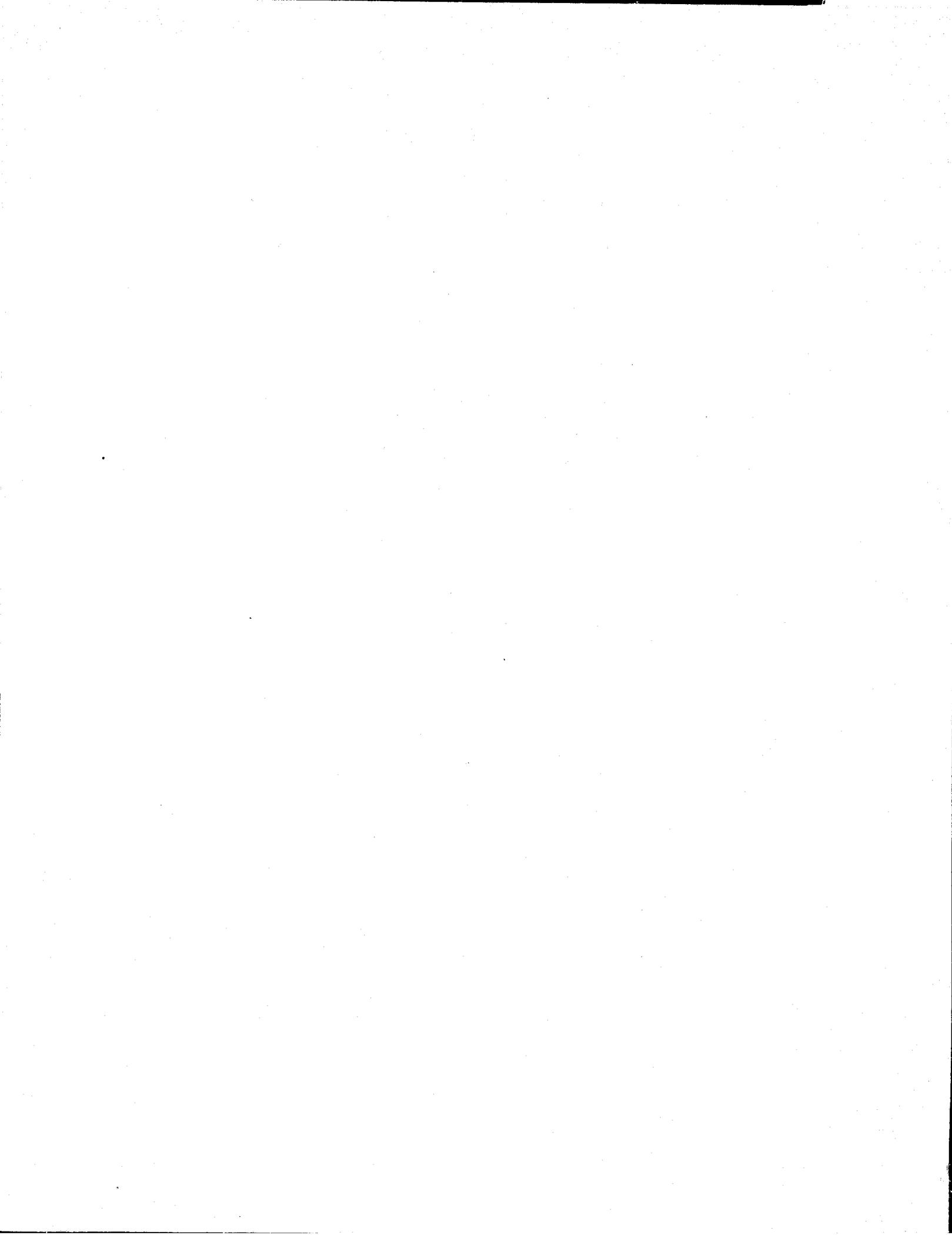


Table C 52

Empirical Studies -- Crime

% ALCOHOLICS WHO COMMITTED CRIME

Author, date, location	Sample	Criminal Record	Non-Status Offenses Only	Alcohol Measure
<u>UNITED STATES</u> Hughes, 1945, Michigan	450 male and 37 female consecutive admissions to Kalamazoo State Hospital between July 1, 1921 and June 30, 1939.	8	.6 homicides(3cases) .4 sex crimes(2cases) (rape and bigamy)	Hospital Diagnosis (Supplemented by social histories from family, relatives, friends, other institutions and social agencies.)
Pittman, Gordon, 1958, Rochester, N.Y.	187 male "chronic inebriate offenders" (at least one prior sentence for public intoxication), randomly selected from those chronic inebriates serving at least 30 day sentences for public intoxication, Monroe County Penitentiary, Rochester, N.Y., 10/53 - 9/54.	100	1 for homicide 2 rape 6 robbery 13 burglary 13 aggravated assault	Prison diagnosis: chronic cases, previous records for drunkenness.
Roth, et. al., 1971, Lewisburg, Pa.	100 male alcoholics, a sample of inmates serving Federal time at Lewisburg, Pa. The alcoholics were divided into two groups; A.A., those attending A.A. meetings, and non-A.A., those displaying symptoms but not attending meetings, (selected randomly from the total prison population.)	100	44 Bad check offences 62 Auto Theft	For the two groups, attending A.A. meetings, or on the basis of prior records, displaying a "chronic alcohol problem".
Weiner, Weaver, 1974, Washington, D.C.	395 males from Washington D.C. Rehabilitation Center. Data collected over 4 weeks.	68	percent unspecified ^c	200 males selected from a larger sample of men reporting or referred to a Washington D.C. rehabilitation center
<u>FOREIGN</u> Ellerman, 1948, Denmark	231 males admitted to Sgt. Hans Mental Hospital between 1924 and 1933 from Psych. clinic stay. (159 separated out for essential analysis.)	38 ^A	24 ^B	Hospital Diagnosis.
Hansen, Teilmann, 1954, Denmark	79 male criminal alcoholics treated at Herstedvester Asylum for Psychopathic Criminals between Nov. 1948-Nov. 1950.	100	74 for theft 26 fraud 20 sex offense 15 violence 6 arson	Hospital or prison diagnosis (all criminal alcoholics).

Table C-52 (continued)

Bartholomew, Kelly, 1965, Australia	853 males and 147 females, first 1000 cases of "Alcoholism" presented at Alcohol Abuse Out-patient Clinic in 1960.	36	13		Diagnosed at alcoholic abuse out-patient clinic.
Rathod, Thompson, 1971, England	30 male and 30 female consecutive admissions to Alcoholic hospital unit.	28		Percent unspecified ^c	Diagnosed at alcoholic unit of hospital.
Lindelius, Salum, 1973, Sweden	1621 males treated during 1956-1961 at alcohol abuse ward at Beckomberga Hospital in Stockholm, Sweden	41	23	violent crimes 76 crimes against property 4 morals	Hospital diagnosis (treated for "acute alcohol abuse.")
Hagnell, et. al., 1973, Sweden	250 males treated consecutively from 1961-1963 at Special Psych. Clinic for Alcohol Abusers.	19		percent unspecified	Alcohol Abuse Clinic diagnosis.
Medhus, Asbjorn, 1975, Sweden	71 females subjected to compulsory alcoholism treatment by Malmo Temperance Board from 1971-1968.	54		percent unspecified	Malmo Temperance Board diagnosis.
Lindelius, Salum, 1975, Sweden	1362 males, 3 groups in Stockholm; men admitted to psych. hosp; men hospitalized for alcohol excess, and homeless men.	35	70	crimes against property 22 violent crime .8 sex crime	Hospital, psychiatric clinic diagnosis.
Washbrook, 1976, England	32 males who were "drunk and disorderly" offenders who served 21 days or less sentences at a Birmingham Prison collected over a 20 week period.	100			Prison diagnosis: based on previous histories.

A Percent of 159

B Excludes begging and vagrancy -- assumes no overlap

C "Percent unspecified", indicates this study did not report the proportion of alcoholics committing non-status offenses. The actual character of the criminal records for these alcoholics is unknown.

Table C-53. Distribution of Arrests for Other
Offenses than Public Intoxication

	<u>Frequency</u>	<u>Number of Offenders</u>	<u>Percentage of All Offenders</u>
Criminal homicide	2	2	1.1
Rape	5	4	2.2
Robbery	14	11	5.9
Burglary	41	24	12.8
Larceny	106	44	23.5
Car theft	10	7	3.8
Forgery, counterfeiting	6	5	2.7
Embezzlement, fraud	6	3	1.6
Carrying and possessing weapons	8	8	4.3
Offenses involving family and children	19	13	7.0
Narcotics law violations	9	6	3.2
Liquor law violations	9	2	1.1
Gambling	2	1	0.6
Aggravated assault	48	24	12.8
Disorderly conduct	106	41	22.0
Vagrancy	175	66	35.5
Driving while intoxicated	22	14	7.5
All other offenses	100	51	27.4
Total	691		

Source: Pittman and Gordon, 1958

The association between criminal behavior and excessive drinking is perhaps best explained as resulting from common elements of the life history of individuals in a particular sub-culture. Testing this explanation depends on a close analysis of the relationship of age to the commission of criminal acts and drinking problems. This analysis is complicated by several disparate pieces of evidence. The drinking problems literature shows the age cohort of 20-24 years old to have the highest level of drinking related problems (Cahalan and Room, 1974). The mean age of treatment center alcoholics, however, is considerably higher than this. Thus, depending on a study's definition of alcoholic or problem drinker and the use of current drinking problems as compared to drinking problems which have ever occurred, the relationship between criminal behavior and alcoholic problems can vary. Most serious crime is committed before the age of thirty-five. This is true also in the population of what might be called criminal alcoholics (where alcoholism is measured by treatment; physical symptoms or convictions for drunkenness). Since most serious crime has been committed before what has traditionally been seen as the age appropriate for the onset of "alcoholism," alcoholism cannot properly be seen as causing criminality. Using life history or longitudinal data, episodes of excessive drinking and criminal behavior are best seen as phases of a deviant career. The work on chronic inebriate offenders suggests that serious crime, if it is committed at all, is committed early in the criminal careers, followed by a longer career of drunkenness offenses (Pittman and Gordon, 1958). The one longitudinal study in the prison studies (Goodwin et al., 1971) obtains similar findings: "criminality by and large preceded the development of a drinking problem." If there is a causal connection, it is crime "causing" chronic inebriacy rather than the other way around.

Victimization of alcoholics

As we have shown in Section III-A the evidence suggests that alcoholics fall prey to those with criminal intent to a much greater extent than others in the population. This is, in part, a function of greater exposure. Although a number of studies document this greater risk, overall, little research attention has been directed to this problem. A recent mortality study (Choi, 1975) shows young alcoholics to be especially vulnerable to violent death and shows homicide to be the most common cause of death.

Section IV: Alcohol and Crime: Variation in the Perceived Relationship

The volume of data on the relationship between drinking and crime precludes a simple summary conclusion. One fact that emerges clearly is that actors in the criminal events, and analysts of these events vary in their perceptions of the effects of alcohol. No study yet has asked, in any detail, the relevant actors for their view of the role of alcohol, yet bits and pieces emerge and are suggestive.

Mayfield, in his study of North Carolina prisoners, asked for prisoners' perceptions of the role of alcohol in the event. Of those who were drinking at the time of the event, 48% felt that drinking played no role in the commission of the crime. Thirty-two percent felt alcohol contributed and 20% felt alcohol played a causal role. A reanalysis of this data showed a strong relationship between drinking at the time of the crime and attributing responsibility for the event to alcohol. Table C-54 shows perceptions of alcohol's role by level of drinking. Drinkers felt that alcohol played a more significant role in the event than those who were not drinking. Similarly, problem drinkers were significantly more likely than others to believe that alcohol played a contributory or causal role (Table C-55). This is supported by a new analysis of the perceived effects of alcohol by Buckley, Milkes and Roizen (1977). This analysis of general population data shows perceived effects to be highly correlated with level of drinking and drinking problems. What is noteworthy in these prison data, however, is the finding that half of the men who were drinking at the time the crime was committed felt that alcohol played no role in the event. This, in spite of the fact that alcohol in this situation could easily have been used to mitigate the offender's responsibility for his deed.

Table C-54. Role of Alcohol by Drinking Status
at Time of Crime

	<u>Irrelevant</u>	<u>Contributory</u>	<u>Causal</u>
Sober	100%		
Drinking	81%	19%	
Drunk	28%	40%	32%

Source: Reanalysis of data presented in Mayfield, 1972.

Table C-55. Role of Alcohol by Drinking History

	<u>Irrelevant</u>	<u>Contributory</u>	<u>Causal</u>
Problem Drinker	53%	23%	24%
Drinkers	75%	19%	7%
Others	100%		

Source: Reanalysis of data presented in Mayfield, 1972.

Globetti reports that of the drinkers in his sample "one half indicated that alcohol was a major reason for their imprisonment." A group of "knowledgeable inmates" and staff when asked by California investigators about alcohol involvement "estimated that about one-half of all offenses are committed while under the influence of alcohol but could not say that alcohol was symptomatic of criminality or that criminality was symptomatic of alcoholism.... California Medical Facility staff and inmates felt that one or two drinks do not hinder and

may even augment skills. Thereafter, there is an inverse relationship between the amount of alcohol consumed and the amount of skill demonstrated in the offense" (California Department of Public Health, 1960). The exception to this was check passing, a crime for which a large proportion of problem drinkers were incarcerated. Here it is assumed that a few drinks are necessary before the commission of the crime if the check passer is to "loosen up enough to make the necessary pitch."

Researchers themselves vary in how much and what kind of responsibility they are willing to attribute to alcohol, in causing criminal behavior. Winkler et al.

argued, "In the present writer's opinion the cause and effect relationship has been overestimated." (1968) Scott, on the other hand, argued that "Primary

alcoholism is responsible for felonies only in rare instances" but

"acute alcoholic intoxication as a peremptory cause was found in a considerable number of cases." (1959) Baker, writing on homicide among American Indians, wrote

"The drinking was not just a matter of a drink or two, but involved the consumption of significant quantities of alcohol to the point of warranting the label of acute intoxication; and in every case the alcohol seemed to be the triggering mechanism that released an acute outburst of hostile, aggressive, overwhelming impulses that culminated in the violent death of another individual.... Under the effects of drugs such as alcohol which weaken superego control, basic emotional drives that have been suppressed or repressed^{or} reacted to in opposite now appear in their raw undiluted form in an overwhelming outburst of emotional dissipation." (1972)

Mayfield reports, "alcohol use appeared to be a significant ingredient in the production of the assaultive behavior in the majority of the cases." (1942)

Manay in his early article argued, "This division (i.e., 'early and confirmed' intemperates) served no other purpose than to indicate the lowered threshold of some who, under the influence of alcohol, regress toward the conduct of the primitive, acting in an impulsive manner, suspending

inhibitory mechanism and the sense of responsibility." More empirically oriented investigators are cautious; "The following preliminary study is directed toward replacing opinions with findings, by actually measuring the amount of association between criminal offenses and drinking involvement for one group of offenders. Because similar studies are rare, no contrasts or comparisons to other findings are offered. There is no intention of claiming generalizability of the findings, nor causal relationships between drinking and crime" (California Department of Public Health, 1959). Gobetti/argued, "Alcohol, although not the cause of deviant behavior, was a weighty and complicating factor in the lives of the inmates."

An explanation of long standing in these literatures is that both criminal and drinking behavior have a common cause in the psychic disorganization of the criminal actor. Grigsby (1963) writes, "...the frame of reference has been that excessive and addictive drinking are symptomatic of the existence of frustration and tension within the individual. The pathology lies in alcoholic drinking practiced in excess, eliminating the use of other more appropriate means which might alter the tension-producing situation." Gibbens and Silberman (1970) and to some extent Guze look to sociopathy as a root cause.

The attempt to find underlying causes of deviant behavior has led at one time and another in the history of this problem, to an interest in deviant careers, i.e., the time order/of deviant acts. As early as 1944 Banay attempted to separate "alcoholic criminals" from "criminals who are alcoholic." Offenders whose drinking problems appeared relatively late in the criminal career or whose drinking "served only as a agent to give false courage or dispel scruples prior to the commission of a crime" were distinguished from those offenders whose criminal careers followed the onset of drinking problems or whose crime and drinking problems occurred simultaneously. Guze's work raises similar

themes but with a lack of clarity with respect to time order. The work of Pittman and Gordon (1958) and data on criminal behavior, generally, suggest that violent crime is predominately a problem of young men. Crimes which are a result of, or coincident with drinking problems tend to be less violent and tend to occur later in a man's life.

The evidence suggests that these are not simply two phases in a criminal career but that crime and drinking careers can be divided into several types. One type of career is that based on a long history of deviant behavior characterized by what several investigators label sociopathy -- a catch-all for a number of deviant behaviors. A disproportionate number of these men and women, it is argued, develop serious drinking problems late in life. Another type of career shows up a long history of drinking problems with few or minor crime problems (Pittman and Gordon, 1958). A third type shows a long history of deviant behavior and a criminal career showing persistent often violent criminal behavior coupled with severe drinking problems. However, in most cases, independent of career type, previous offenders who are still free to commit crimes tend to commit few violent crimes once they reach thirty-five years of age.

As Pernanen has argued, the relationship between alcohol and crimes of violence has received attention from a number of disciplines:

1. Criminological studies of victims and offenders
2. Studies of alcoholics
3. "Psychological experiments on the effect of different doses and types of alcohol on the behavior of alcoholics or nonalcoholics.
4. Anthropological descriptions of predominantly primitive tribes and their behavior in alcohol use situations.
5. Studies of EEG-patterns, brain syndromes, head injuries in alcoholics and nonalcoholics or violent offenders in nonalcohol conditions and after consumption of alcohol.
6. Longitudinal studies of genetic and developmental factors, in the etiology of alcohol problems and other behavior tendencies, including proclivities toward violent behavior." (Pernanen, 1976)

Each area of research brings a somewhat different set of explanatory concepts and constraints to bear on the problem.

Little attempt has been made in non-experimental literatures to clarify the nature of even the independent variable -- the "aspect" of alcohol under study. In this research, this has moved between BAC, congener content, drinking norms, type of alcohol, "believing oneself to be drunk." The ascribed effects of alcohol, as we have seen, are also numerous. With respect to alcohol's "disinhibiting" properties alone Pernanen has argued:

Alcohol is labeled as an agent that "weakens inhibitions" (Fitzpatrick, 1974; Roebuck and Johnson, 1962), "weakens self-control (Macdonald, 1961); "releases inhibitions (Shuntich and Taylor, 1972); "liberates impulses and emotion which are normally under control" (Hopwood and Milner, 1940); "liberates deep features of the personality" and consequently "awakens aggressive tendencies" (Medina, 1970). It "reduces inhibitions and self-control," and leads to a "loss of inhibitory capacity and subsequent unleashing of personal predilections" (Hopwood and Milner, 1940); and it has a "disinhibiting effect" (Scott, 1968). It is known as a "disinhibiting, aggression-provoking substance" (Brill, 1970), and "as a trigger of violence" (Blumer, 1973). Its pharmacological role is described as that of "releasing aggression, removing inhibitions, etc." (Glatt, 1965).

Further, little attempt has been made to integrate experimental and non-experimental research, although there are common underlying theories of alcohol's effects in both areas. Several of these are outlined below. Most focus on aggression and alcohol but several touch on the effects of alcohol on moral turpitude. They are presented here to underscore the complex nature of the perceived relationship between alcohol and crime. The first several theories deal with the alcohol/aggression relationship, the second several theories deal with a number of alcohol effects which are relevant to constructing general explanations of the relationship of drinking and crime.

Alcohol as Disinhibitor

This portrayal of alcohol's effects has been by far the most common. In nearly every review of the non-experimental findings, the "disinhibitor" properties of alcohol intoxication are invoked (Wolfgang, 1968; President's Commission on the Causes and Prevention of Violence, 1970; Wolfgang and Ferracuti, 1970; Pavlov, 1975). This experimental literature has been amply reviewed on more than one occasion (see Carpenter and Armenti, 1969; D'Arcy Templeton, 1975; Pernanen, 1976).

Two forms of the disinhibition hypothesis have been advanced in the experimental literature. The first position argues that the mechanism relating drinking and aggressive behavior is primarily, if not wholly, physiological. Disinhibited behavior is defined as aggressive responses to various experimental tests.

The second position is slightly more complex but in the last result more ambiguous. This model is that used by Heatherington and Wray (1964) and stresses the dependence between disinhibited and inhibited states. That is, only those who are aggressively inhibited can be disinhibited to aggressive displays after

drinking. Thus, the relationship between drinking and becoming aggressive should hold for inhibited individuals but not for others. Disinhibited behavior is again equivalent to aggressive response.

The first conception of disinhibition certainly faces a wealth of disconfirming evidence. Bennett et al. (1969) found that various dosages of alcohol were followed by no apparent change in level of aggressive behavior. Lang et al. (1975) found expectancy (the belief that you were, or had been drinking), to explain more variation in aggression levels than the actual ingestion of alcohol. The importance of thinking you had drunk alcohol also proved important in similar studies by Marlatt, Demming and Reid (1973), and Wilson and Lawson (1976). Studies by Shuntich and Taylor (1972); Boyatzis (1974); Taylor and Gammon (1975); and Taylor et al. (1976) all contribute evidence against a necessary or sufficient or necessary and sufficient relation between drinking and becoming aggressive. In each case, a substantial proportion of individuals who drank, or believed they had, did not become aggressive.

McAndrew and Edgerton have seriously weakened the disinhibition argument in non-experimental settings by showing the cultural determinants of drunken comportment. Pernanen also sharply criticized the disinhibition explanation:

"A fact that should arouse one's suspicions is the general acceptance of such a concept (and purported explanatory model) by researchers and other individuals from so many diverse fields: medicine, experimental psychology, psychiatry, anthropology, alcohol epidemiology, sociology, etc. It could, of course, be seen as an indication that an explanatory disinhibition model has become so firmly established by research that it is almost universally accepted. On the other hand, knowing that this is not the case, one should ask whether all who seem to accept such a model really (comparing their backgrounds) can have the same explanatory model in mind. One possible explanation is that the disinhibition concept, which seems to be used in an explanatory function by many authors, actually is used to describe behavior that is known to occur or have occurred in a proportion of alcohol use situations, behavior that is described as being "disinhibited" or "uninhibited" in common use of language " (Pernanen, 1945).

Alcohol as activator:Epinephrine/Norepinephrine and Aggression

Much research has posited the activity of epinephrine/norepinephrine as the mediating link between alcohol and aggression. Two theoretical constructs have emerged:

- 1) Alcohol → Altered epinephrine norepinephrine activity → Stress → Aggressive behaviors
- 2) Alcohol → Activation of certain chemical codes of aggressive behavior, norepinephrine, epinephrine → Aggressive behaviors

One of the most well researched findings in the alcohol research literature is the relationship between alcohol level and increased norepinephrine levels in animals, and increased urinary excretion of both epinephrine and norepinephrine in humans. However, results are equivocal for the effects of ethanol on steady state norepinephrine levels in the brain, and no articulate theory of ethanol's effects on epinephrine/norepinephrine catabolism exists as yet. The relationship between epinephrine and norepinephrine and stress is less well documented. In numerous studies on humans, changes in the activity of epinephrine and norepinephrine were associated with stressful behavioral states, but epinephrine and norepinephrine were not the only substances "involved". The overlapping functions of different substances within the system of neurotransmitters, therefore, place constraints on any discussion of the independent effects of a particular substance.

The relationship between emotional states and aggressive behavior is equally problematic since there is no straightforward relation between stressful states and aggressive behavior. As shown by Singer and Schacter (1969), emotions, as perceived by the individual, are a joint function of physiological state and cognitive structure.

The second model above eliminates the mediation of emotional states, substituting a direct link between physiological changes and behavior. Theories of this type posit the existence of certain "chemical codes for behavior," (Miller, 1965), or "triggers for aggression" (Mark and Ervin, 1970).

Non-experimental research has documented the importance of the quality of the interaction of victim and offender in events leading up to a criminal act. Alcohol, it is argued, may directly affect the "flash point" or threshold of aggressive behavior as well as increased stress which, in turn, decreases the clarity with which cues are perceived (Shoham et al., 1974). The role of alcohol in the process of escalation has received little attention in either experimental or non-experimental behavioral research.

3) Alcohol and the Dyscontrol Syndrome

The Dyscontrol Syndrome is a recent explanation of the relationship between drinking and violent behavior (Mark and Ervin, 1970). The syndrome itself is characterized by a particular seizure-like reaction to alcohol labelled "pathological intoxication."

"We found that these violent people usually had four characteristic symptoms, (which were not, however, always present at the same time): 1) a history of physical assault, especially wife and child beating; 2) the symptom of pathological intoxication, that is, drinking even small amounts of alcohol triggers acts of senseless brutality; 3) a history of impulsive sexual behavior, at times including sexual assaults; 4) a history (in those who drive cars) of many traffic violations and serious automobile accidents. We shall refer to this set of symptoms together as "the dyscontrol syndrome."¹⁶

The putative basis for this syndrome is apparently internal brain abnormality (Mark and Ervin, 1970).

The concept of pathological intoxication received early attention by Bowman and Jellinek (1941), Banay (1944); and early criticism by May (1953), who advocated the removal of the concept from professional terminology.

The incidence of pathological intoxication is hard to determine. Banay maintains, "In the New York State Hospital system, 'pathological intoxication', accounts for 8 to 9 percent of all first admissions for alcoholic psychoses." Haggard and Jellinek (1953), estimate "two percent of all first admissions for alcoholism with psychosis are diagnosed as pathological intoxication." Recently, Bach y Rita, et al. (1974) discovered of the 130 patients admitted to Massachusetts hospitals for repeated episodes of seizure-like violence, twenty-four were diagnosed "pathological intoxicants."

However, as May (1953) has argued, there is no agreement about the actual diagnosis of pathological intoxication.

While Mark and Ervine suggest that the underlying cause of the dyscontrol syndrome is brain damage or brain abnormality, the evidence is less than convincing. Hill and Patterson (1942), found 48 percent of 151 psychopaths to have abnormal EEGs. Williams (1969) observed abnormal EEGs in 49.5 percent of the 333 prisoners with "known crimes of violence" on their record, this was a subpart of the total 1,250 prisoners referred to two British hospitals over a twenty year period prior to 1969. These prisoners had been referred for EEG examinations before trial or imprisonment. In both the above cases the "normal" individuals had 15 percent and 12 percent abnormal EEGs respectively. Bach-y-Rita, et al. discovered abnormal EEG patterns in 37 of 79 patients given tests, which was part of the total 130 patients diagnosed as having episodic dyscontrol. In each of the above cases the percentage was based on a very restricted sample; certainly a small proportion of all offenders. A recent study at Lewisburg penitentiary displays EEG observations in direct opposition to Mark and Ervin's expectation. (Ervin brought this study to light, see p. 259, Valenstein, 1973.) In a more recent piece of work, Hafner and Boker (1973), although using somewhat flawed data,

discovered the incidence of committing violent crimes amongst the mentally retarded was no greater than amongst the population at large. The putative relationship between alcohol and aggressive behavior advanced here depends on the incidence of the syndrome within the violent population. From the data so far this is, at best, a small percentage of all offenders (Valenstein, 1973).

4) Alcohol As Frustrator

Recent work by Moskowitz et al. suggests a strong relationship between decremental performance of complex tasks and drinking. Situations with the potential for violence are inherently complex -- having several actors, disagreement over fact or values, and often several observers. The narrowing (although in another context) of perceptual field that results from drinking, these investigators argue, / decreases the ability to act on several cues at the same time. This is consistent with research previously cited on the decremental changes in ability to process new information as a function of drinking (Parker, 1977).

5) Alcohol and Mood

Experimental research suggests that alcohol enhances mood as much as changes mood. Thus anger, frustration, sorrow can be intensified while drinking. Those drinking alone appear to be especially vulnerable.

Positive mood changes, e.g. exhilaration or increased sociability are, however, often followed by depressant reactions. Some evidence exists for increased willingness to take risks after drinking (Cohen et al., 1958). Projective tests taken after drinking tend to show increases in sexual and aggressive items when compared to a nondrinking state.

6) Alcohol and Motor Impairment

Alcohol's effect on sensorimotor behavior has long been acknowledged (Levine, 1977; Walgren and Barry, 1970). Sensorimotor impairment has received almost no attention in the drinking/crime literature. Theoretical attention

in the drinking/crime literature has focused on moral rather than physical impairment.

Sensorimotor effects have, perhaps, their strongest impact on the victim rather than the offender since a drinking victim is easily identified by motor performance. A drinking offender may, however, misjudge his strength, and visual clues, causing an uncoordinated threat to become a murderous blow.

7) Alcohol and Changes in Cognition

The ability of a criminal actor to test his judgment of a criminal situation, to redefine a potentially violent situation, or minimally to escape depends, in part, on his conceptual grasp of the situation. A number of studies show decremental changes in cognitive ability especially in the ability to process new information. Drinking related memory impairment has long been documented. Recent work suggests cognitive impairment in a population of even social drinkers (Parker, 1977).

8) Social/Cultural Effects

These range from the social utility of alcohol claims in mitigating responsibility for deviant acts to sub-cultural variation in norms surrounding both drinking and criminal behavior. Alcohol's putative affects on coping mechanisms in combination with culturally constrained "face saving" or machismo behavior can set a grim trajectory in criminal acts. Sociologists and cultural historians have spent little effort in this work making this the least well developed area of research on drinking and crime.

*

*

*

CONTINUED

5 OF 9

We have catalogued these "effects" of alcohol to underscore possible components of an alcohol/crime theory. Many potential "effect" explanations (e.g. sensorimotor impairment) have not made their way into the alcohol and crime literature. A prima facie case has long been thought to exist for the disinhibition hypothesis. In part this is due to the appeal of explaining one personal pathology with another. This range of "effects" presented suggest that there are a number of alternative explanations which would do as well as disinhibition in a scientific sense but are less socially compelling. The persistence of disinhibition as an explanation for immoral and illegal behavior suggest that its explanatory power is largely ascientific.

Levine has argued that the "disinhibition" theory has allowed alcohol to be linked to a wide variety of deviant acts which were necessary for an industrializing society to put under strong social control:

It was not so much that middle class Americans invented completely new ideas about the effects of alcohol, but rather that they redefined its effects as stimulant and relaxant in terms of a new view or gestalt (a nineteenth century view) of the relationship of the individual to the self and to society. The old effects took on new meaning when viewed from a perspective shaped by the social conditions and ideological concerns of the nineteenth century. Thus liquor, while still powerful and sacred was besides being part of God's world, now also part of the Devil's -- it was a Demon. And as a Demon, a destroyer of self-control, it was blamable for many of the ills of American society -- in particular crime and violence. (Levine, 1977)

Unfortunately few other perceived or actual "effects" of alcohol on criminal activity have received this kind of thoughtful analysis. This is clearly an important area for future research.

Summary

The long social history of the alcohol/crime problem; the complex and varied data; the number of potential theories suggest that there will not be a single or simple conceptual scheme soon forthcoming. A dialogue has persisted throughout this century between those who argue that "the influence of intemperance upon crime is. . . direct and obvious," and those who argue

"The study of crime offers peculiar difficulties. Crime being an intentional act, the causes must be facts which influence the motives of men. And as the motives of men are often mixed, it is evident that several motives may combine to cause a crime. Crime cannot, therefore, be attributed to a single cause as (for example) poverty. This fact has necessitated a somewhat complicated method of classification, under which we have not only endeavored to ascertain how far intemperance was a cause of crime, but also how far it was found combined with other leading causes, notably unfavorable environment and lack of industrial training in bringing about crime." (Koren, 1916)

Those who have held for a direct and simple link between drinking and crime -- most commonly temperance reformers, participants in the criminal justice system, and not infrequently, policy makers and social scientists -- have declined in numbers with the increasing sophistication of statistical evidence. Their place has been taken by others who, while accepting, in principle, multifactoral, complex explanations of the relationship between drinking and crime, have failed, in fact, to integrate the several levels of theory and the wealth of empirical data.

This literature is conspicuous for its neglect of theory in motivating research, even though, as we have argued, a number of theories exist which are potentially useful in organizing data: theories relating alcohol and aggression; alcohol-specific subcultural theories or personality theories.

Little research has attempted to define and measure alcohol specific relationships within theories and no research has attempted to simultaneously address more than one theory. A move in this direction is research which would measure more than one aspect of alcohol -- e.g. drinking problems and drinking in the event.

The absence of studies which measure both long term and short term effects of alcohol has led to the too easy acceptance of diverse data linking alcohol and crime. Thus, the prevalence of crime problems among heavy drinkers, the prevalence of drinking problems among criminal offenders and drinking at the time of a criminal event are all taken as evidence of alcohol's responsibility for criminal behavior. This coupled with the absence of theoretical focus in these literatures limits the utility of the data presented here to markers for areas of potential work on the role of alcohol in criminal events, the drinking problems of criminal offenders, and the criminal careers of labelled alcoholics.

Footnotes

1. See Rowntree, 1900.
2. Throughout this paper we have tried to be sensitive to the language problems which plague this research: sensitive to which "aspects" and "effects" of alcohol are being asserted; which formulation of the alcohol and crime problem is at issue. At the same time, in the interest of readability, we use two concepts interchangeably except where one or the other is at issue: alcohol and drinking. Thus we refer throughout to the "alcohol/crime," "drinking/crime" problem. We distinguish in the text those areas of discussion where one particular aspect of alcohol, e.g. ethanol, is at stake.
3. For example, a recent report of a speech before the National Homicide Symposium presented by the California District Attorneys' association argued, "alcohol is involved in 50 per cent of all homicides because it increases belligerency and releases the superego." S.F. Chronicle, October 28, 1976.
4. Bard and Zacker, 1974.
5. The data in this section are taken from the FBI, Crime in the U.S., reports published annually. See FBI, Uniform Crime Reporting Handbook, Washington D.C.: U.S. Government Printing (1962), for explanation of this reporting system.
6. There are many theories of alcohol's effects on human physiology (see Section IV); some more accepted than others. There are many theories which attempt to explain criminality. However, two facts remain unintegrated: (1) Alcohol has definite physiological effects which may be seen as universal; (2) only a very small proportion of the drinking population commits crimes. An alcohol/crime theory would speak to these issues.
7. Close in terms of time transpired. Experience changes the nature of the crime in the minds of the offender and relevant witnesses. In this sense, arrested population research is closer to and a more reliable source of information about the event.
8. Past record, personality, background of the offender, the salience of certain crimes, different juries all cause attrition in the sample of offenders (and crimes) from arrest to conviction and sentencing.
9. The reviews most sensitive to these issues are Staff Report to the National Commission on the Causes and Prevention of Violence. U.S. Government Printing Office (1969), Bartholemew (1965), and Pernanen (1975).

10. BAC is obtained by various procedures, e.g. Breath Analysis, chemical analysis of blood samples, urinalysis, etc. See Chapter I for a discussion of these.
11. Robinson (1966).
12. Box (1971), p. 176, 190.
One study reported by this author indicates that significantly higher percentages of lower class offenders were prosecuted when their actions were discovered by a private detective agency than were higher status employees of the same firm apprehended by the same agency.
13. Walker (1971), pp. 178-182.
14. Beginning with complaint and terminating in judicial disposition, low income and minority persons appear to be the victims of unequal treatment. A particularly instructive study of shoplifting disclosed that a department store's detectives observed minority shoppers more closely; when apprehended, they were four times as likely to be prosecuted by the store, and five times more likely to be charged with larceny. A similar bias, though not as extreme, was evident against males as well. A comparison of self-reported delinquency with official arrest rates for minor juvenile offenses reveals disparities based upon race; and other surveys suggest that minority youths are treated more severely by the courts. Cameron (1964), pp. 174-175; Box (1971), pp. 190-208; Mulvihill et al. (1969), pp. 34-35; Pope, 1975.
15. Myers (1976).
16. The reduction in offenders samples can be seen in Shupe, whose sample of arrested offenders is but a fraction of the total arrested population, much less the total of all reported crime.
17. See Mills, The Sociological Imagination, Oxford Books, (1959).
18. See Galtung, Theories and Methods of Social Research, p. 467-469.
19. R. Roizen, (1975).
20. The introductory data for each of the sections on particular crimes presented below are taken from that presented in the 1975 Uniform Crime Reports.
21. For a more complete treatment of the disinhibition hypothesis, see Section IV of this Chapter, p. 401.
22. In the years of the cited studies, 61% of the population of Washington D.C. was nonwhite, 18% of the population of Philadelphia was black. 91% of the rape offenders in Washington D.C. were nonwhite, 83% of the Philadelphia offenders were black.

23. Although demographic comparisons across assault studies are difficult to make because of differences in reporting, the tables below suggest that the emergency room sample differs markedly from the arrest sample.

Pittman & Handy (Victims and offenders together) Thum et al. (Hospital Assault Patients)

<u>AGE</u>	<u>PERCENTAGE</u>	<u>AGE</u>	<u>PERCENTAGE</u>
Under 20	13.9%	16-25	41.5%
20-34	43.2%	26-45	39.4
35-49	28.6	46-65	15.9
50+	14.3	65+	3.2
 <u>SEX</u>			
Men	74%		87%
Women	26		13
 <u>% MARRIED</u>			
	60%		27%

24. Thum et al. used the Hollingshead Two-factor Index of Social Position and reported that 75% of those admitted to the emergency room were in classes IV or V. It is interesting to note that the social class position of those admitted for assaults did not differ appreciably from those admitted for accidents.
25. President's Commission on Crime in D.C., 1966, p. 79.
26. For a discussion of this, see Pittman and Handy (1964).
27. See Tables C-27 and C-28 for estimates of Alcohol Presence in Homicides.
28. As can be seen from Table 22, the South displays a consistent tendency for increased violence in absolute numbers, and by rates per 100,000 population. The South has long been conspicuous for high homicide-assault totals and rates. This fact has been the subject of considerable discussion and debate. Many explanations have been advanced: a greater proportion of blacks, poor, aspects of the occupational structure, rural nature of the South, etc. In each case the data has been uncooperative. Both southern whites and blacks display an increased proclivity for violence as compared to their northern counterparts. (See Hackney, 1969).

35. Before considering the alcohol specific data, a word on changing methods of homicide is needed. "From 1962 when these FBI figures were first published to 1972, the relative proportion of shootings of all homicides has risen 22 percent, at the expense of stabbings and other methods (although the absolute numbers in all categories have risen)."

Increasingly homicide is committed with the use of handguns. This is not to say that these older data are no longer relevant, but it is to acknowledge that insofar as alcohol is involved differentially by method, these overall relationships could change in the contemporary context.

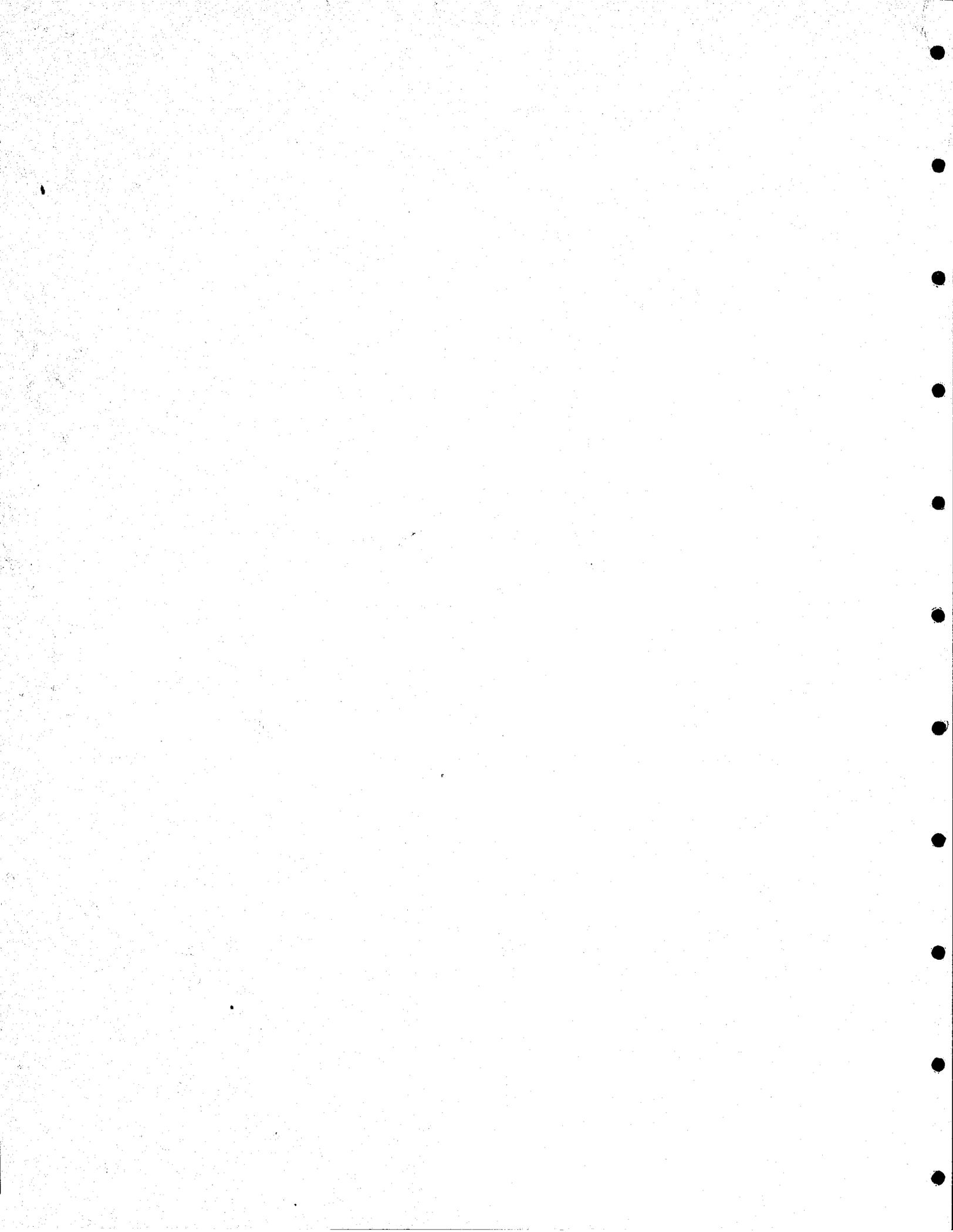
36. See Table C-30.

37. "Experience tells us ... that the relationships between perpetrator and victim are much more intricate than the rough distinctions of criminal law. Here are two human beings. As soon as they draw near to one another -- male or female, young or old, rich or poor, ugly or attractive -- repulsions as well as attractions are set in motion. What the law does is to watch the one who acts and the one who is acted upon. By this external criterion a subject and objects, a perpetrator and a victim are distinguished. In sociological and psychological quality the situation may be completely different. It may happen that the two distinct categories merge. There are cases in which they are reversed and in the long chain of causative forces the victim assumes the role of the determinant." - Von Hentig, The Murderer and His Victim (1948)

38. Data presented here are reanalysis of original data described in U.S. Department of Justice, LEAA, National Criminal Justice Information and Statistics Service, "Census of State Correctional Facilities 1974 Advance Report", NPS Special Report, July 1975.

39. Three of these studies (Normandeau, Amir and Wolfgang) use the same source of data (arrest records), use the same variables and had a common scientific advisor in Marvin Wolfgang. These three were done in Philadelphia.

40. Three fourths of the prisoners labelled problem drinkers (on the basis of a yes response to "In general, has the use of alcoholic beverages been a problem in your life?") scored five or more on the index.



BIBLIOGRAPHY

(See p. 464 for final additions)

- Abrahamsen, David
1944 Crime and the Human Mind. New York: Columbia University Press.
- Abrahamsen, David
1950 "Study of 102 sex offenders at Sing Sing." Federal Probation, Vol. 14, No. 3, Pp. 26-32.
- Adams, G.R. and Hamm, N.
1973 "A partial test of the 'continguity' and 'generalized imitation' theories of the social modeling process." J. of Genetic Psychology, Vol. 123, No. 1, Pp. 145-154.
- Adler, H.
1952 "The relation of alcohol and crime." Pp. 310-326 in H. Emerson Ed., Alcohol and Man, New York: The Macmillan Co.
- Adler, H.
1974 "The alcoholic felon." Alcohol Health and Research World, Summer, Pp. 17-23.
- Aho, Timo
1976 "Alkoholie ja vakivalta." (Alcohol and violence), Oikensministeriön vankeinhoito-osaston julkaisuja, Sarja D., No. 7/76, p. 22.
- Alha, A.; Uotila, U. and Tamminen, V.
1974 "Oilenslaaketieteellisissä ruumiinavauksissa todettu alkoholi." (Alcohol found in autopsies), Suomen Lääkärilehti, Vol. 29, Pp. 3021-3024.
- Allikmet, L.H.
1974 "Cholinergic mechanisms in aggressive behavior." Med. Biol., Vol. 52, No. 1, Pp. 19-30.
- Amir, Menachem
1967 "Criminality among Jews: An overview." Issues in Criminology, Vol. 6, No. 2, Pp. 1-39.
- Amir, Menachem
1971 Patterns in Forcible Rape. Chicago: University of Chicago Press.
- Anderson, Nels
1923 The Hobo. Chicago: Chicago University Press. Phoenix Books edition, 1961.
- Argeriou, Milton
1975 "Daily alcohol consumption patterns in Boston: Some findings and a partial test of the Tuesday hypothesis." JSA, Vol. 36, Pp. 1578-1583.
- Aschaffenburg, G.
1913 Crime and Its Repression. Boston: Little, Brown and Co.
- Avis, Harry H.
1974 "The neuropharmacology of aggression: A critical review." Psychological Bulletin, Vol. 81, No. 1, Pp. 47-63.

- Ax, Albert F.
1953 "The Physiological differentiation between fear and anger in humans." Psychosomatic Medicine, Vol. 15, No. 5, 433-441.
- Bach-y-Rita, George; Lion, John, R. and Ervin, Frank, R.
1970 "Pathological intoxication: Clinical and EEG studies." American Journal of Psychiatry, Vol. 127, No. 5, Pp. 158-163.
- Bach-y-Rita, G.; Lion, J.R., Climent, G.E. and Ervin, F.R.
1971 "Episodic dyscontrol: Study of 130 violent patients." American J. Psychiat., Vol. 127, No. 11, p. 49.
- Bach-y-Rita, George and Veno, Arthur
1974 "Habitual violence: A profile of 62 men." American Journal of Psychiatry, Vol. 131, No. 9; Pp. 1015 - 1017.
- Bacon, Selden D.
1945 "Inebriety, Social Integration and Marriage." Memoirs of the Section on Alcohol Studies Yale University #2. New Haven: Quart. J. Stud. on Alcohol.
- Bacon, Selden D.
1963 "Alcohol, alcoholism and crime." Crime and Delinquency, Vol. 9, Pp. 1-14.
- Badonnel, H.
1951 "Alcoholism and prison statistics." Ann. Med. Log Vol. 31, Pp. 350-352, (Article in French).
- Baenninger, Ronald
1974 "Some consequences of aggressive behavior: A selective review of the literature on other animals." Aggressive Behavior, Vol. 1, Pp. 17-37.
- Bahr, Howard
1973 Skid Row. New York: Oxford University Press.
- Baker, James L.
1959 "Indians, alcohol and homicide." Journal of Social Therapy, Vol. 5, Pp. 270-275.
- Baker, D.; Telfer, M.A.; Richardson, C.E. and Clark, G.R.
1970 "Chromosome errors in men with antisocial behavior." JAMA. Vol. 214, No. 5, p. 869.
- Baker, S.; Robertson, L. and Spitz, W.
1971 "Tattoos, alcohol, and violent death." Journal Forensic Sciences, Vol. 16, No. 2, Pp. 219-228.
- Banay, Ralph S.
1942 "Alcoholism and crime." QJSA, Vol. 2, pp. 686-716.
- Banay, Ralph S.
1945 "Alcohol and aggression." Pp. 143-152 in Alcohol Science, and Society. New Haven: Journal of Studies on Alcohol.
- Banay, Ralph S.
1957 We Call Them Criminals. New York: Appelton-Century-Crofts, Inc.

- Bandura, A.; Ross, D. and Ross, S.
1961 "Transmission of aggression through imitation of aggressive models." Journal of Abnormal and Social Psychology, Vol. 63, No. 3, Pp. 575-582.
- Bandura, Albert
1973 Aggression, A Social Learning Analysis. Englewood Cliffs: Prentice Hall Inc.
- Bard, Morton and Zacker, Joseph
1974 "Assaultiveness and alcohol use in family disputes: Police perceptions." Criminology, Vol. 12, No. 3, Pp. 281-292.
- Baron, R.A.
1973 "Theoretical retaliation from the victim as an inhibitor of physical aggression." J. of Research in Personality, Vol. 7, No. 2, Pp. 103-115.
- Bartholomew, A.
1965 "Incidence of a criminal record in 1000 consecutive alcoholics." British Journal of Criminology, Vol. 5, No. 2, pp. 143-149.
- Bartholomew, Allen, A.
1968 "Alcoholism and crime." Australian and New Zealand Journal of Criminology, Vol. 1, No. 2, Pp. 70-99.
- Bass, A.H. ; Plomin R. and Carver, C.
1973 "Delay of frustration and aggression." Psychological Reports, Vol. 32, No. 3, (Pt. 2), P. 1074.
- Bennett, A.E.
1967 "Treatment of brain damage in alcoholism." Current Psychiatric Therapies, Vol. 7, Pp. 142-145.
- Bennett, Walter and Globetti, Gerald
1969 "The relationship between alcohol and the convicted offender in Mississippi." Dept. of Sociology and Anthropology, Mississippi State University, Mississippi, Publ. So.-An., No. 13, July.
- Bennett, R.M.; Buss, A.H. and Carpenter, J.A.
1969 "Alcohol and human physical aggression." QJSA, Vol. 30, Pp. 870-876.
- Bensing, Robert C. and Shroeder, Oliver, Jr.
1960 Homicide in an Urban Community. Springfield, Illinois: Thomas Books.
- Berkowitz, Leonard
1962 Aggression: A Social Psychological Analysis. New York: McGraw Hill Book Company.
- Best, Harry
1930 Crime and the Criminal Law in the United States. New York: The Macmillan Co.
- Billings, John S. et al.
1905 The Liquor Problem. Boston: Houghton Mifflin and Co.

- Birrel, J.H.W.
1965 "Blood alcohol levels in drunk drivers, drunk and disorderly subjects and moderate social drinkers." Medical Journal of Australia, Vol. 2, No. 23, Pp. 949-953.
- Blacker, E.
1965 "Drinking behavior of delinquent boys." QJSA, Vol. 26, No. 2, Pp. 233-236.
- Blane, H. T.
1965 "Drinking and crime." Federal Probation, Vol. 29, No. 2, Pp. 25-29.
- Bloom G.; Euler, Von, U.S. and Frankenhauser M.
1962 "Catecholamine excretion and personality traits in paratroop trainees." Acta Physiol. Scand., Vol. 58, Pp. 77-89.
- Blum, Richard H.
1967 "Mind-altering drugs and dangerous behavior: Alcohol." Appendix B of Task Force Report: Drunkenness, President's Commission on Law Enforcement and the Administration of Justice. Washington: USGPO.
- Blum, Richard H.
1969 Society and Drugs: Drugs I: Social and Cultural Observations. San Francisco: Jossey-Bass, Inc.
- Blum, Richard H.
1969 Society and Drugs: Drugs II: College and High School Observations. San Francisco: Jossey-Bass, Inc.
- Bogdanski, Donald F. and Brodie, Bernard B.
1969 "The effects of inorganic ions on the storage and uptake of H³-Norepinephrine by rat heart slices." The Journal of Pharmacology and Experimental Therapeutics, Vol. 165, No. 2, 181-189.
- Bohmer, Carol
1973 "Judicial use of psychiatric reports in the sentencing of sex offenders." Journal of Psychiatry and Law, Summer, Pp. 223-241.
- Bondler, Richard J. and Flynn, John P.
1974 "Neural pathwarp from thalamus associated with regulation of aggressive behavior." Science, Vol. 183, No. 4120, Pp. 96-99.
- Bonger, William
1969 Criminality and Economic Conditions. Bloomington: Indiana University Press.
- Boudouris, J.
1971 "Homicide and the family." Journal of Marriage and the Family, Vol. 33, Pp. 667-682.
- Bowden, K.M.; Wilson, D.W. and Turner, L.K.
1958 "A survey of blood alcohol testing in Victoria (1951-1956)." Medical Journal of Australia, Vol. 2, Pp. 13-15.

- Box, Steven
1971 Deviance, Reality and Society. London: Holt, Rinehart and Winston.
- Boyatzis, R.E.
1974 "The effect of alcohol consumption on the aggressive behavior of men." QJSA, Vol. 35, Pp. 959-972.
- Boyatzis, R.E.
1975 "Predisposition toward alcohol-related interpersonal aggression in men." JSA, Vol. 36, No. 9, Pp. 1196-1207.
- Brearley, H.C.
1932 Homicide in the United States. Chapel Hill: The University of North Carolina Press.
- Brenner, Charles
1971 "The psychoanalytic concept of aggression." International Journal of Psycho-analysis, Vol. 52, No. 2, Pp. 137-144.
- Brill, H.
1970 "Drugs and aggression." Mental Health Digest, Vol. 3, No. 1, Pp. 11-13.
- Bronson, F.H. and Eleftheriou, B.E.
1965 "Relative effects of fighting on bound and unbound corticosterone in mice." Proc's Soc. Exp. Biol. & Med., Vol. 118, No. 1, Pp. 146-149.
- Bubbock, Sir John
1974 "Alcohol in accidents and crime." Journal of Alcoholism, Vol. 9, No. 1, Pp. 1-6.
- Bullock, Henry Allen
1955 "Urban homicide in theory and fact." Journal of Criminal Law, Jan. - Feb., Pp. 565-575.
- Cahalan, D.; Cisin, I. and Crossley, H.
1967 American Drinking Practices. (Report No. 3) Washington D.C.: Social Research Group, George Washington University.
- Cahalan, D.; Cisin, I. and Crossley, H.
1969 American Drinking Practices. New Brunswick, NJ: Rutgers Center of Alcohol Studies.
- Cahalan, D. and Room, Robin
1974 Problem Drinking Among American Men. New Brunswick, NJ: Rutgers Center of Alcohol Studies.
- Calhoun, John B.
1972 "Disruption of behavior status as a cause of aggression." Nebraska Symposium on Motivation, Vol. 20, Pp. 183-260.
- California Department of Justice
1967 "Willful homicide in California 1963-1965." Division of Law Enforcement, Bureau of Criminal Statistics.

- California Department of Justice
1971 (Approximate) "Resistance by drug arrestees to Bureau of Narcotic Enforcement Agents." Division of Law Enforcement, Bureau of Criminal Statistics, Bureau of Narcotic Enforcement.
- California State Department of Justice
1972 "Crime and delinquency in California." Bureau of Criminal Statistics, Division of Law Enforcement.
- California Department of Justice
1972 "Crime and delinquency in California." Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Justice
1973 "Offender based transaction statistics." Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Justice
1974 "A proposed crime index number." Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Justice
1974 "Jail space utilization study." Special Project Series, Report 1, Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Justice
1975 "Automated criminal history system (CHS) users guide." Division of Law Enforcement, Bureau of Identification, January.
- California Department of Justice
1975 "California comprehensive data systems, criminal justice profile." Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Justice
1975 "Drug diversion conference report." Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Justice
1975 "Instruction for completing design requirements." Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Justice
1976 "A description of the upward mobility and career opportunity development program in the bureau of criminal statistics." Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Justice
1976 "Juvenile probation, statistical information system." Division of Law Enforcement, Bureau of Criminal Statistics.
- California Department of Public Health
1959 "Law Violators, Probation Status, and Drinking Involvement: A Pilot Study." Division of Alcoholic Rehabilitation, Publication No. 4.
- California Department of Public Health
1960 "Criminal Offenders and Drinking Involvement: A Preliminary Analysis." Division of Alcoholic Rehabilitation, Publication No. 3.

- Cameron, M.O.
1964 The Booster And The Snitch. New York: Free Press.
- Cannon, Walter B.
1939 The Wisdom of the Body. New York: W.W. Norton and Company Inc.
- Carpenter, John
1962 "Effects of alcohol on some psychological processes." QJSA, Vol. 23, No. 2, Pp. 274-314.
- Carpenter, J.A. and Armenti, N.P.
1972 "Some Behavioral Effects of Alcohol in Man", pp. 509-543 in: Benjamin Kissin and Henri Begleiter, eds., The Biology of Alcoholism, vol. 2, New York: Plenum.
- Carratala, R.
1944 "Importance of chemical diagnosis and of a rational treatment of alcoholism in the prophylaxis of crime." La Prensa Medica Argentina, Vol. 31, Pp. 2587-2596.
- Cason, H. and Pescor, M.J.
1946 "A comparative study of recidivists and nonrecidivists among psychopathic federal offenders." Journal Crim. Law Criminol. Vol. 31, Pp. 236-238.
- Cason, H. and Pescor, M.J.
1946 "A statistical study of 500 psychopathic prisoners." Public Health Reports, Washington, Vol. 61, Pp. 557-574.
- Cassity, J.
1941 "Personality study of 200 murderers." J. Crim. Psychopath., Vol. 2, Pp. 296-304.
- Chalmers, J.P.; Baldessarini, R.J. and Wurtman, R.J.
1971 "Effects of L-Dopa on Norepinephrine Metabolism in the Brain." Proceedings of the National Academy of Sciences, Vol. 68, No. 3, Pp. 662-666.
- Chambers, Carl D; Incardi, James A. and Siegal, Harvey A.
1975 Chemical Coping: A Report on Legal Drug Use in the United States. New York: Spectrum Publications, Inc.
- Chase, L.J. and Mills, N.H.
1973 "Status of frustration as a facilitator of aggression: A brief note." Journal of Psychology, Vol. 84, No. 2, Pp. 225-226.
- Chief Medical Examiner, Atlanta, Georgia, cited in Harper, F., 1976
- Chief Medical Examiner, Miami, Florida, cited in Harper, F., 1976

- Chipman, Samuel E.L.
1845 "The Temperance Lecturer Being Facts Gathered from a Personal Examination of all the Jails and Poor-houses of the State of New York Showing the Effects of Intoxicating Drinks in Producing Taxes, Pauperism and Crime." Albany, New York.
- Choi, S.Y.
1975 "Death in young alcoholics." JSA, Vol. 36, No. 9, Pp. 1224-1229.
- Christiansen, Karl O.
1965 Scandinavian Studies In Criminology. Oslo, London: Tavistock Publications.
- Christie, Nils
1965 "A study of self reported crime." Scandinavian Studies in Criminology. Vol. 1, Pp. 86-116.
- Ciarenal, R.D.; Lipsky, A. and Axelrod, J.
1974 "Association between fighting behavior and catecholomine biosynthetic enzyme activity in 2 inbred mouse sublimes." Proc. Natl.Acad. Sci. U.S.A., Vol. 71, No. 8, Pp. 3006-3008.
- Clark, Walter
1966 "Demographic characteristics of tavern patrons in San Francisco." QJSA, Vol. 27, No. 2, Pp. 316-327.
- Cleveland, F.P.
1955 "Problems in homicide investigation: The relationship of alcohol to homicide." Cincinnati J. Med., Vol. 36, Pp. 28-30.
- Climent, C.E.; Rollins, A.; Ervin, F.R and Plutchik, R.
1973 "Epidemiological studies of women prisoners." Amer. J. Psychiat., Vol. 130, p. 985.
- Climent, C.E. and Ervin, F.R.
1972 "Historical data in the evaluation of violent subjects. A hypothesis generating study." Arch. Gen. Psychiatry, Vol. 27, No. 5, Pp. 621-4.
- Clinard, Marshall B. and Quinney, Richard
1967 Criminal Behavior Systems: A Typology. New York: Holt, Rinehart and Winston, Inc.
- Cloninger, C. and Guze, S.
1970 "Psychiatric illness and female criminality: The role of sociopathy and hysteria in the antisocial woman." American Journal of Psychiatry, Vol. 127, No. 3, 23pp.
- Cloninger, C. and Guze, S.
1973 "Psychiatric illness in the families of female criminals: A study of 288 first degree relatives." British Journal of Psychiatry, Vol. 122, Pp. 697-703.

- Cloninger, C.; Reich, T. and Guze, S.
1975 "Genetic-environmental interactions and antisocial behavior."
Presented at the NATO Advanced Study Institute on Psychopathic Behavior,
Les Arcs, France.
- Cohen, Bruce J. (ed.)
1970 Crime in America. Ithaca: F.E. Peacock Publishers, Inc.
- Cohen, Herman (ed.)
1920 The Criminal Appeal Reports. London: Sweet and Maxwell.
- Cohen, J.; Dearnaley, E.J. and Hansel, C.E.M.
1958 "The risk taken in driving under the influence of alcohol."
British Medical Journal, Vol. 1, Pp. 1438-1442.
- Cole, K.E.; Fisher, Gary and Cole, Shirley
1968 "Women who kill." Archives of General Psychiatry, Vol. 19,
Pp. 1-8.
- Commission on the Causes and Prevention of Violence
1969 "The role of alcohol, narcotics, dangerous drugs in individual
violence." See Mulvihill, D.J., et al., 1969.
- Conner, W.D.
1973 "Criminal Homicide, USSR/USA: Reflections on Soviet data in
a comparative framework." J. Criminal Law, Criminology and Police
Science, Vol. 64, No. 1, Pp. 111-117.
- Cook, S.A.
1962 "Criminal behavior and the use of beverage alcohol." Canadian
Journal of Corrections, Vol. 4, No. 4, Pp. 83-102.
- Cook, Timothy; Gath, Dennis and Hensman, Celia (eds.)
1969 Proceedings of the International Symposium on The Drunkenness
Offense. Oxford: Pergamon Press.
- Cordeau, J. Pierre; de Champlain, J. and Jacks B.
1971 "Excitation and prolonged waking produced by catecholamines injected
into the ventricular system of cats." Canadian Journal of Physiology
and Pharmacology, Vol. 49, No. 7, Pp. 627-631.
- Corning, P.A. and Corning, C.
1972 "Toward a general theory of violent aggression." Social Science
Information, Vol. 11, Pp. 7-35.

- Corrodi, A.; Fuxe, K. and Hokfelt, T.
1966 "The effects of ethanol on the activity of central catecholamine neurones in rat brain." J. Pharm. Pharmac., Vol. 18, Pp. 82]-823.
- Coscina, D.V.; Seggie, J.; Godse, D.D. and Staneer, H.C.
1973 "Introduction of rage in rats by central injection of G-hydroxydopamine." Pharmacology, Biochemistry and Behavior, Vol. 1, No. 1, Pp. 1-6.
- Criminal Justice Commission
1967 "Criminal homicides in Baltimore, Maryland, 1960-1964." An analysis prepared by the staff of the Criminal Justice Commission Inc., Baltimore, Maryland.
- Cristiansen, Karl O.
1960 "Alcohol as a crime factor, with special regard to its consequences for the treatment of offenders." Proceedings of 26th International Congress on Alcohol/Alcoholism, Stockholm.
- Cruz, C.J.
1943 "Sexual criminogenesis and other medico-legal considerations." Revista Mexican Psiquiatria, Neurologia y Medicina Legal, Vol. 10, Pp. 3-14.
- Curran, F.J.
1937 "Personality studies in alcoholic women." Journal Nervous Mental Disorders, Vol. 86, Pp. 645-667.
- Curtis, Lynn
1974 Criminal Violence. Lexington, Massachusetts: D.C. Heath and Co.
- Curtis, Lynn A.
1974 "Victim precipitation and violent crime." Soc. Prob. Vol. 21, No. 4, Pp. 594-605.
- Curtis, Lynn
1975 Violence, Race and Culture. Lexington, Massachusetts: D.C. Heath and Co.
- Cuthbert, T.M.
1970 "A portfolio of murders." British Journal of Psychiatry, Vol. 116, No. 1, Pp. 1-10.
- Cutler, R. and Morrison, N.
1971 Sudden death: A study of characteristics of victims and events leading to sudden death in British Columbia with primary emphasis on apparent alcohol involvement and Indian sudden death. Vancouver, B.C.: Alcoholism Foundation of British Columbia.

- Cutter, H.; Key, J.; Rothstein, E. and Jones, W.
1973 "Alcohol, power and inhibition." QJSA, Vol. 34, No. 2, Pp. 381-389.
- Daniels, David N.; Gilula, Marshall F. and Ockberg, Frank M.
1970 Violence and the Struggle for Existence. Boston: Little Brown and Company Inc.
- Davis, Virginia E.; Brown, Harold; Huff, James A. and Cashoaw, Jesse L.
1967 "Ethanol-induced alteration of norepinephrine metabolism in man," J. Lab. & Clin. Med., Vol. 69, No. 5, Pp. 787-799.
- Day, Nancy
1976 "Measures of alcohol related mortality and morbidity in California." Social Research Group Working paper F-43, Berkeley: Social Research Group.
- Dayton, Neil
1940 New Facts on Mental Disorders. Springfield: Charles C. Thomas Publishers.
- Deasy, Sean; Ruppert, Gerald and Nordmoe, Dennis
1973 "County of Wayne 1972: Alcohol related violent deaths." Report to Detroit Department of Health, Division of Alcoholism, Bureau of Substance Abuse, Michigan, May, Pp. 7-8.
- De Porte, J.V. and Parkhurst, E.
1935 "Homicide in New York State -- A statistical study of the victims and criminals in thirty-seven counties in 1921-1930." Human Biology, Vol. 7, Pp. 47-73.
- Dervillée, P.; Lépée, P.; Lazarini, H.J. and Dervillée, E.
1961 "Statistical indications of a possible relationship between alcoholism and criminality." Rev. Alc., Vol. 7, Pp. 20-21.
- Derrick, E.H.
1967 "A survey of the mortality caused by alcohol." The Medical Journal of Australia, November 11.
- Dewar, R. and Sommer, R.
1964 "Alcohol Consumption in Prairieville." QJSA, Vol. 25, Pp. 300-313.
- Diethelm, Oskar
1955 Etiology of Chronic Alcoholism. Springfield: Charles C. Thomas Publishers.
- Dotson, L.E.; Robertson, L.S. and Tuchfeld, B.
1975 "Plasma alcohol, smoking, hormone concentrations and self-reported aggression." JSA, Vol. 36, No. 5, Pp. 578-586.
- Drake, S.A.
1917 Old Boston Taverns and Tavern Clubs, Boston: W.A. Butterfield.

- Drew, R.H.
1961 "Alcoholic offenders in a Victorian prison." Medical Journal of Australia, Vol. 48, Pp. 575-578.
- Dumars, Kenneth W.
1971 "Parental drug usage: Effect upon chromosomes of progeny." Pediatrics, Vol. 47, No. 4, Pp. 1037-41.
- Duritz, Gilbert and Truih, Edward B. Jr.
1966 "Importance of acetaldehyde in the action of ethanol on brain norepinephrine and 5-hydroxytryptamine." Biochemical Pharmacology, Vol. 15, Pp. 711-721.
- East, W.N.
1945 "Psychopathic personality and crime." J. Ment. Sci., Vol. 91, Pp. 426-446.
- Eastwood, J.M.
1974 "Effects of viewing a film of professional hockey on aggression." Medicine and Science in Sports, Vol. 6, No. 2, Pp. 158-163.
- Edwards, Griffith; Gattoni, Frank; Hensman, Celia and Peto, Julian
1976 "Drinking problems in prison populations." pp. 50-62 In G. Edwards, M.A.H. Russell, D. Hawks and M. McCafferty (eds) Alcohol Dependence and Smoking Behavior. New York: Saxon House/Lexington Books.
- Edwards, Griffith; Hensman, Celia and Peto, Julian
1971 "Drinking problems among recidivist prisoners." Psychol. Med., Vol. 1, Pp. 388-399.
- Edwards, G.; Gattoni, F. and Hensman, C.
1972 "Correlates of alcohol dependence scores in a prison population." QJSA, Vol. 33, Pp. 417-429.
- Efron, V.
1955 "The tavern and the saloon in Old Russia." QJSA, Vol. 16, Pp. 484-503.
- Efron, Vera
1958 "Notes and comments: Alcohol consumption in the Soviet Union." QJSA, Vol. 19, No. 4, Pp. 668-670.
- Efron, V.; Keller, M. and Gurioli, G.
1972 "Statistics on consumption of alcohol and on alcoholism." Report published by Rutgers Center of Alcohol Studies, New Brunswick, N.J. Copyright JSA Inc., 18 pp.
- Ellermann, Mogens
1948 "Social and clinical features of chronic alcoholism (Based on a study of 231 male patients)." J. Nerv. Ment. Dis., Vol. 107, Pp. 556-568.
- Eleftheriou, Basil E. and, Scott, John Paul
1971 The Physiology of Aggression and Defeat. New York: Plenum Press.

- Ellison, G.D. and Flynn, J.P.
1968 "Organized aggressive behavior in cats after surgical isolation of the hypothalamus." Archives Italiennes de Biologie, Vol. 106, No. 1, Pp. 1-20.
- Emerson, H.
1932 "The relation of alcohol and crime." Pp.310-324 (Chapt. XII) in H. Emerson, ed., Alcohol and Man, New York: Macmillan.
- Ennis, P.H.
1967 "Crime, victims and police." Transaction, June, Pp. 36-44
- Epstein, S. and Taylor, S.P.
1967 "Instigation of aggression as a function of degree of defeat perceived aggressive intent of the opponent." J. Personality, Vol. 35, Pp. 265-289.
- Erskine, Helen
1972 Alcohol and the criminal justice system: Challenge and response, (Monograph) U.S. Dept. of Justice, LEAA.
- Erskine, Mary S. and Levine, Seymour
1973 "Suppression of pituitary adrenal activity and shock induced fighting in rats." Physiology and Behavior, Vol. 11, No. 6, Pp. 787-790.
- Esterly, R.W.
1971 "Alcoholic rehabilitation program in the Prince George's County Division of Parole and Probation." Maryland State Medical Journal, October, Pp 81-84.
- Euler, Von, U.S. and Lundberg, U.
1954 "Effect of flying on the epinephrine excretion in Air Force personnel." J. Applied Physiology, Vol. 6, No. 8, Pp. 55--65.
- Everett, G.M. and Borcharding J.W.
1970 "L-dopa: Effect on concentrations of dopamine, norepinephrine, and serotonin in brains of mice." Science, Vol. 168, No. 3933, Pp. 849-850.
- FBI
Crime in the U.S., 1965, 1970, 1975. (Published annually in Washington D.C. by U.S. Government Printing Office).
- FBI
1974 "Law enforcement officers killed." FBI Uniform Crime Reports.
- Feighner, John P.; Roberts, Eli; Guze, Samuel; Woodruff, Robert; Winokur, George and Munox, Rodrigo
1972 "Diagnostic criteria for use in psychiatric research." Arch. Gen. Psychiat., Vol. 26, January, Pp. 57-63.

- Feldstein, Aaron; Hoagland, Hudson; Wong, Keith and Freeman, Harry
1963 "Biogenic amines, biogenic aldehydes and alcohol." QJSA, Vol. 25,
Pp. 218-225.
- Ferri, E.; Kelly, J.; Lisle, J.; Smithers, W.; Ellwood, C. and Myers, Q.
1917 Criminal Sociology. Boston: Little, Brown and Co.
- Feshbach, N.D.
1973 "The effects of violence in childhood." Journal of Clinical Child
Psychology, Vol. 2, No. 3, Pp. 28-31.
- Feshbach, S.
1970 "Aggression." Pp. 159-259 in P. Musen (ed.), Carmichaels' Manual
of Child Psychology, Vol. II, New York: Wiley.
- Field, Mark G.
1955 "Alcoholism, crime and delinquency in Soviet society." Social
Problems, Vol. 3, No. 2, Pp. 100-109,
- Filkins, L.D.; Clark, C.; Rosenblatt, D.; Carlson, W.; Kerlan M. and Manson, H.
1970 "Alcohol abuse and traffic safety: A study of fatalities, DWI
offenders, alcoholics and court-related treatment approaches." Final
Report, Contract FH-11-6555 and GH-11-7129. Highway Safety Research
Institute, University of Michigan, June.
- Fink, Arthur, E.
1938 Causes of Crime: Biological Theories in the United States
1800-1915. Philadelphia: University of Pennsylvania Press.
- Fisher, R.S.
1951 "Alcohol, accidents and crime," Maryland Medical Journal,
Vol. 3, Pp. 291-292.
- Fitzpatrick, Joseph P.
1974 "Drugs, alcohol, and violent crime." Addictive Diseases, Vol. 1,
No. 3, Pp. 353-367.
- Foulds, G.A. and Hassall, Christine
1969 "The significance of age of onset of excessive drinking in male
alcoholics." Brit. J. Psychiat., Vol. 115, Pp. 1027-32.
- Fox, V.
1946 "Intelligence, race, and age as selective factors in crime."
J. Crim. Law and Criminol. Vol. 37, Pp. 141-152.
- Frame, M.C.
1955 "Alcoholism: Some medico-legal aspects." Journal of Forensic
Medicine, Vol. 2, Pp. 151-53, 170-172.
- Frankenhauser, Marianne and Koreby, Sonja
1962 "Effect of meprobamate on catecholamine excretion during mental
stress." Perceptual and Motor Skills, Vol. 15, No. 3, Pp. 571-577.

- Frankenhauser, Marianne and Patkai, Paula
1965 "Interindividual differences in catecholamine excretion during stress." Scand. J. Psychol. Vol. 6, No. 2, 1965.
- Frankenhauser, Marianne and Post, Birgitta
1962 "Catecholamine excretion during mental work vs. modified by centrally acting drugs." Acta physiol. scand., Vol. 55, Pp. 74-8].
- Funkenstein, D.H.
1955 "The physiology of fear and anger." Scientific American, Vol. 192, No. 15, Pp. 74-80.
- Funkenstein, D.H.; Greenblatt, M. and Solomon, H.C.
1952 "Nor-epinephrine-like and epinephrine-like substances in psychotic and neuropsychotic patients." Amer. J. Psychiat., Vol. 108, No. 9, Pp. 652-662.
- Funkenstein, D.H. and Meade, Lydia W.
1954 "Nor-epinephrine-like and epinephrine-like substances and the elevation of blood pressure during acute stress." J. Nerv. Ment. Dis., Vol. 119, No. 5, 380-396.
- Funkenstein, D.H.; King, S.H. and Drolette, Margaret E.
1957 Mastery of Stress, Cambridge: Harvard University Press.
- Gammage, Allen Z.; Jorgensen, David L. and Jorgensen, Eleanor M.
1972 Alcoholism, Skid Row and The Police. Springfield: Charles C. Thomas Publisher.
- Garofalo, Baron Raffaele
1914 Criminology. Boston: Little Brown & Co.
- Garratini S. and Siggs, E.B. (Eds.)
1969 Aggressive Behavior. New York: Wiley and Sons Inc.
- Gebhard, Paul; Gagnon, John H.; Pomeroy; Wardell B.; and Christson, Cornelia V.
1965 Sex Offenders. New York: Harper and Row.
- Geib, Frederick A.
"The ultimate victim: Life-cycle of a corpse." Unpublished paper.
- Gerber, S.R.
1974 Coroner's Statistical Report. Cuyahoga County, Cleveland, Ohio.
- Gerchow, Joachim
1964 "On the importance of alcohol on criminal behavior in general." From the 27th International Congress on Alcohol and Alcoholism, West Germany.
- Geyer, Mark A. and Segal David, S.
1974 "Shock induced aggression: Opposite effects of intraventricularly infused dopomine and noropinephrine." Behav. Biol., Vol. 10, No. 1, Pp. 99-104.

- Giallombardo, Rose
1966 Society of Women: A Study of a Women's Prison. New York: John Wiley & Sons, Inc.
- Gibbens, T.C.N. and Silberman, M.
1970 "Alcoholism among prisoners." Psychological Medicine, Vol. 1, Pp. 73-78.
- Gibbons, D.C.
1971 "Observations on the study of crime causation." American Journal Soc., Vol. 77, No. 2, Pp. 262-278.
- Gil, D.
1971 "A socio-cultural perspective on physical abuse." Child Welfare, Vol. 50, Pp. 389-395.
- Gillespie, W.H.
1971 "Aggression and instinct theory." International Journal of Psychoanalysis. Vol. 52, No. 2, Pp. 155-160.
- Gillies, Hunter
1965 "Murder in the west of Scotland." British Journal of Psychiatry, Vol. 3, Pp. 1087-1094.
- Gillin, John Lewis
1946 The Wisconsin Prisoner Studies in Criminogenesis. Wisconsin: The University of Wisconsin Press.
- Glaser, Daniel and O'Leary, Vincent
1966 "Crimes ascribed to drunkenness." The Alcoholic Offender, USGPO, p. 12.
- Glatt, M.M.
1965 "Crime, alcohol, and alcoholism." The Howard Journal, Vol. 11, p. 274.
- Globetti, Gerald; Bennett, Walter and Alsikafi, Majeed
1974 "Alcohol and crime: Previous drinking careers of convicted offenders." Presented at the Midwest Sociological Society Meetings, Omaha, Nebraska, April 3-6.
- Glueck, Bernard
1918 "A study of 608 admissions to Sing Sing Prison." Mental Hygiene, Vol. II, January, Pp. 90-92.
- Gold, M.
1958 "Suicide, homicide, and the socialization of aggression." American Journal of Sociology, Vol. 63, Pp. 651-661.
- Goldberg, Leonard
1970 "Effects of ethanol in the central nervous system." Chapt. 7 in Robert E. Popham ed., Alcohol and Alcoholism, Toronto: University of Toronto Press.

- Goldberg, M.E.; Insalaco, J.R.; Hefner, M.A. and Saloma, A.I.
 1973 "Effects of prolonged isolation on learning, biogenic amine turnover and aggressive behavior in 3 strains of mice." Neuropharmacology, Vol. 12, No. 11, Pp. 1049-1058.
- Goldberg, M.E. and Salama, A.I.
 1969 "Norepinephrine turnover and brain monoamine levels in aggressive mouse-killing rats." Biochemical Pharmacology, Vol. 18, No. 2, pp. 532-534.
- Goldman, Marion S.
 1976 Social Class, Sexual Commerce, and the Criminal Community. Paper Presented at 71st annual meeting of the American Sociological Assn.
- Goldstein, J.H.; Davis, R.W. and Herman, D.
 1975 "Escalation of aggression: Experimental studies." Journal of Personality and Social Psychology, Vol. 31, Pp. 162-170.
- Gonzales, Vance and Halperin
 1948 cited in Wilentz, 1953.
- Goodwin, D.; Crane, J. and Guze, S.
 1971 "Felons who drink: An eight year follow-up." QJSA, Vol. 32, Pp. 136-147.
- Goodwin, Donald
 1973 "Alcohol in suicide and homicide." QJSA, Vol. 34, Pp. 144-156.
- Goring, Charles
 1913 The English Convict, London: His Majesty's Stationery Office .
- Gorma, Angel
 1971 "Within the realm of the death instinct." International Journal of Psycho-analysis, Vol. 52, No. 2, Pp. 145-154.
- Gove, W.R.
 1970 "Sleep deprivation: A cause of psychotic disorganization." American Journal of Sociology, Vol. 75, Pp. 782-795.
- Graham, Hugh D. and Gurr, Ted R.
 1969 Violence in America: Historical and Comparative Perspectives. New York: The New American Library, Inc.
- Gray, M.G. and Moore, M.
 1941 "The incidence and significance of alcoholism in the history of criminals." Journal of Criminal Psychopathology, Vol. 3, Pp. 289-325.

- Greenland, C.
1971 "Evaluation of violence and dangerous behavior associated with mental illness." Sem. Psychiat., Vol. 3, No. 3, p. 345.
- Greenland, C.
1973 "Research strategies in the evaluation of violent and dangerous behavior." Social Worker, Vol. 41, No. 1, p. 4.
- Gresham, S.; Webb, W.B. and Williams, R.L.
1963 "Alcohol and caffeine: Effect on inferred visual dreaming." Science, Vol. 140, Pp. 1226.
- Grigsby, Shaw Earl
1963 "The Raiford study: Alcohol and crime." Journal of Criminal Law, Criminology, and Police Science, Vol. 54, No. 3, Pp. 296-306.
- Gross, Milton M. and Goodenough, Donald R.
1968 "Sleep disturbances in the acute alcoholic psychoses." Chapter IX in Jonathan O. Cole, ed., Clinical Research in Alcoholism, Psychiatric Research Report #24, American Psychiatric Assoc., Washington D.C.
- Gross, W. and Nerviano, V.
1973 "The use of the personality research form with alcoholics: Effects of age and IQ." Journal of Clinical Psychiatry, Vol. 29, No. 3, Pp. 378-379.
- Gunn, John; Nicol, Rory; Gristwood, Jean and Foggits, Roger
1973 "The characteristics of long-term prisoners." British Journal of Criminology, Vol. 13, No. 4, Pp. 331-340.
- Guttmacher, Manfred S.
1960 The Mind of the Murderer. New York: Forran, Straus and Cudahy.
- Guze, Samuel B; Tuason, Vincente B; Gatfield, Paul D; Stewart, Mark A. and Picken, Bruce.
1962 "Psychiatric illness and crime with particular reference to alcoholism: A study of 223 criminals." J. Nerv. Ment. Dis., Vol. 134, No. 6, Pp. 512.
- Guze, Samuel B.; Tuason, Vincent B.; Stewart, Mark A.; Gatfield, Paul D. and Picken, Bruce.
1963 "A study of check offenders." Dis. Nerv. Syst., Vol. 24, Pp. 752-754.
- Guze, Samuel B. and Cantwell, Dennis P.
1965 "Alcoholism, parole observations and criminal recidivism: A study of 116 parolees." Diseases of the Nervous System, October; Pp. 436-439.
- Guze, Samuel B; Wolfgram, Edwin D.; McKinney, Joe R. and Cantwell, Dennis P.
1967 "Psychiatric illness in the families of convicted criminals: A study of 519 first-degree relatives." Diseases of the Nervous System, Vol. 28, No. 10, Pp. 651-659.

- Guze, Samuel B.; Goodwin, Donald W. and Crane, J. Bruce
 1970 "A psychiatric study of the wives of convicted felons: An example of assortative mating." American Journal of Psychiatry, Vol. 126, No. 12, Pp. 115-118.
- Guze, Samuel B. and Goodwin, Donald W.
 1971 "Diagnostic consistency in antisocial personality." American Journal of Psychiatry, Vol. 128, No. 3, 21 Pp.
- Guze, Samuel B.
 1972 "Criminality and psychiatric illness: The role of alcoholism." Proceedings of the Joint Conference on Alcohol Abuse and Alcoholism, Washington D.C.
- Haberman, P.W. and Baden, M.M.
 1974 "Alcoholism and violent death." QJSA, Vol. 35, Pp. 221-231.
- Hackney, Sheldon
 1969 "Southern violence." American Historical Review, Vol. 74, Pp. 907-923.
- Hafner, H. and Baker, W.
 1973 "Mentally disordered violent offenders." Social Psychiatry, Vol. 8, No. 4, Pp. 220-229.
- Hagnell, O.; Nyman, E. and Tunving, K.
 1973 "Dangerous alcoholics." Scand. J. Soc. med., Vol. 1, No. 3, p. 125-131.
- Hamburg, D.A.
 1971 "Recent research on hormonal factors relevant to human aggressiveness." Int. Soc. Sci. J. Vol. 23, No. 1, Pp. 36-47.
- Hansen, H.A. and Teilmann, K.
 1954 "A treatment of criminal alcoholics in Denmark." QJSA, Vol. 15, Pp. 246-287.
- Hansen, G. and Jentzsch, G.
 1956 "On the contribution of alcohol to violent and natural causes of death." Dtsch. Gesundheitwes., Vol. II, Pp. 1737-1745.
- Harford, Thomas C.
 1975 "Policy Implications of a Contextual Analysis of Drinking." Prepared for presentation at the 21st International Institute on the prevention and treatment of alcoholism, Epidemiology Section, Helsinki, June 9-15.
- Harford, Thomas C.
 1976 "Drinking Contexts: A Developmental Approach." Paper prepared for the 22nd International Institute on the Prevention and Treatment of Alcoholism, Vigo, Spain. June 7-16.

Harger, R.N.

1949 "Debunking the drunkometer." American Journal of Police Science, Vol. 40, Pp. 497-505.

Harlan, H.

1950 "Five hundred homicides." Journal of Criminal Law and Criminology, March-April, Pp. 736-752.

Harper, Frederick

1976 "Alcohol and Crime in Black America." in Frederick Harper ed., Alcohol Abuse and Black America, Alexandria, Virginia: Douglass Publishers.

Hartcollis, P.

1962 "Drunkenness and suggestion: An experiment with intravenous alcohol." QJSA, Vol. 23, Pp. 376-389.

Hassall, C. and Foulds, G.

1968 "Hostility among young alcoholics." British Journal of Addiction, Vol. 63, Pp. 203-208.

Haughey, David W. and Norman A. Neiberg (eds.)

1962 Alcohol, Alcoholism and Crime. A Conference at Chatham, Cape Cod June 6-8, 1962 (publisher not listed)

Hayner, N.S.

1961 "Characteristics of five offender types." American Sociological Review, Vol. 26, Pp. 96-102.

Healy, William

1915 The Individual Delinquent. Boston: Little, Brown and Co.

Henderson, D.K.

1937 "Alcoholism and psychiatry." Brit. J. Inebr., Vol. 34, p. 99.

Hensman, Celia

1969 "Problems of drunkenness amongst male recidivists." Pp. 35-50 in T. Cook, D. Gath, and C. Hensman, eds., The Drunkenness Offense, Oxford: Pergamon Press.

Hertting, G. and Axelrod, J.

1961 "Fate of tritiated noradrenaline at the sympathetic nerve endings." Nature, Vol. 192, No. 4798; Pp. 172-173.

Hetherington, E.M. and Wray, N.P.

1964 "Aggression, need for social approval and humor preferences." Journal of Abnormal and Social Psychology, Vol. 68, No. 6, Pp. 685-689.

Higgins, Lois L. and Fitzpatrick, Edward A.

1958 Criminology and Crime Prevention. Milwaukee: The Bruce Publishing Company.

- Hill, Harris E.
1962 "The social deviant and intitial addiction to narcotics and alcohol." JSA, Vol. 23, No. 4, Pp. 562-582.
- Hill, Reuben
1949 Families Under Stress: Adjustment to the Crisis of War Separation and Reunion. New York: Harper & Bros. Publishers.
- Hoffman, Helmit and Nelson, Paul C.
1971 "Personality characteristics of alcoholics in relation to age and intelligence." Psychological Reports, Vol. 29, Pp. 143-146.
- Hokanson, Jack E. and Burgess, Michael
1962 "The effects of three types of aggression on vascular processes." Journal of Abnormal and Social Psychology, Vol. 64, No. 6, Pp. 446-449.
- Hollis, Slater
1974 "On the etiology of criminal homicides: The alcohol factor." Journal of Police Science and Administration, Vol. 2, Pp. 50-53.
- Holt, Eleanor
1968 "The relationship between the use of alcohol and criminal activity." Information Review on Crime and Delinquency, May, No. 9, 19 p.
- Honkanen, R. and Visuri, T.
1976 "Blood alcohol levels in a series of injured patients with special reference to accident and type of injury." Ann. Chir. Gynaecol. Fenn., Vol. 65, Pp. 287-294.
- Hopkins, Richard
1925 "Prohibition and crime." The North American, September, No. 222. Pp. 40-44.
- Hughes, Estella M.
1945 "Problem alcoholics in a state mental hospital and on parole." Journal of Clinical Psychopathology, Vol. 6, Pp. 551-570.
- Hurst, P.M. and Bagley, S.F.
1972 "Acute adaptation to the effects of alcohol." QJSA, Vol. 33, Pp. 358-377.
- Hutchins, D.A.; Pearson, J.D.M. and Sharmon, D.F.
1974 "Altered metabolism of dopamine in striatal tissue of mice made aggressive by isolation." British J. of Pharmacology, Vol. 5], No.], Pp. 115-116.
- Immonen, E.J.
1973 "The alcohol problem in Finland up to date." Abstracts on Criminology and Penology, Vol. 13, No. 4, Pp. 387-396.
- Im Obersteg, J.
1952 "The official management of alcoholics in Basel." Gesundheit und Wohlfahot, Vol. 32, No. 8, Pp. 479-508.

Im Obersteg, J. and Baumler, J.

1967 "Unfalle unter der Eiwerbung von Arzneimitteln und alkohol."
Schweiz Med. Wochenschr., Vol. 97, Pp. 1039.

International Association of Chiefs of Police

1976 Alcohol Enforcement Countermeasures. USA: International Assoc.
of Chiefs of Police.

Jacobs, Herbert H. et al.

1961 Behavioral Approaches to Accident Research. New York: Association
for the Aid of Crippled Children.

Jessor, R. and Jessor, S.

1973 "Problem Drinking in Youth: Personality, Social and Behavioral
Antecedents and Correlates." Pp. 3-23 in M. Chafetz, ed., Proceedings of
the Second Annual Alcoholism Conference of the National Institute on
Alcohol Abuse and Alcoholism. Washington, D.C.: USGPO.

Jofre de Breyer, I.J.; Acevedo C.; and Torrelío, M.

1972 "Influence of ethanol on the effects of D1-p-Chlorophenylalanine on
Biogenic Amines of Rat Brain." Drug Res., Vol. 22, No. 12, Pp. 2140-2142.

Johannson, G.

1974 "Relation of biogenic-amines to aggressive behavior." Med. Biol.
Vol. 52, No. 3, 189-192.

Johnson, Roger N.

1972 Aggression in Man and Animals. Philadelphia: W.B. Saunders
and Company.

Jones, H.

1959 "Alcohol and corrections." Canadian Journal of Corrections, Vol. 1,
October, Pp. 29-33.

Jones, Howard

1963 Alcoholic Addiction. London: Tavistock Publications.

Jones, Kathryn M.

1971 A Bibliography on Personal Violence: An Index for Understanding
and Prevention. Houston: University of Texas at Houston School of
Public Health.

Jorvik, Lissy F.; Klodin, Victor and Matsuyoma, Steven S.

1973 "Human aggression and the extra Y chromosome: Fact or fantasy?"
American Psychologist, Vol. 28, No. 8, Pp. 674-682.

- Joss, G.
1947 "Contribution of alcohol to accident fatalities in Hennepin County during a one year period." QJSA, Vol. 7, Pp. 588-595.
- Journal of Alcoholism
1974 "Alcohol in accidents and crime." (editorial), Vol. 9, No. 1, Pp. 1-6.
- Julius, D. and Bohacek, N.
1953 "The alcoholic psychoses in forensic psychiatry." Neuropsychiatry, Vol. 1, Pp. 21-26.
- Kalant, Harold
1962 "Some recent physiological and biochemical investigations on alcohol and alcoholism." QJSA, Vol 23, Pp. 52-93.
- Kalant, H.
1970 "Cellular effects of alcohols." Chapter 4 in Robert E. Popham ed., Alcohol and Alcoholism, Toronto: University of Toronto Press.
- Kalin, R.; McClelland, D.C. and Kahn, M.
1972 "Effects of male social drinking on fantasy." Pp. 3-20 in David C. McClelland, William N. Davis, Rudolf Kalin and Eric Wanner, (eds.), The Drinking Man, New York: The Free Press.
- Karli, P.
1956 "The Norway rat's killing response to the white mouse: An experimental analysis." Behavior, Vol. 10, Part 1-2, Pp. 6-103.
- Kastl, A.J.
1969 "Changes in ego functioning under alcohol." QJSA, Vol. 30, No. 2, Pp. 371-382.
- Katkin, E.S.; Hayes, W.N.; Teger, A.I. and Pruitt, D.G.
1970 "Effects of alcoholic beverages differing in congener content on psychomotor tasks and risk taking." QJSA, Supp. No. 5, Pp.101-114.
- Kilmer, Theron W.
1933 "Alcoholism: Its relation to policework and jurisprudence." Correction, Vol. 3, Pp. 11-12.
- Kinberg, O.; Inghe, G. and Lindberg, T.
1957 "Kriminalitet och alkoholmissbruk." (Criminality and misuse of alcohol), Stockholm: Institutet för Maltdrycksforskning (Pub. No. 9), JSA, Vol. 21, No. 2.

Kirbens, S.M.

1968 "Chronic alcohol addiction and criminal responsibility." American Bar Association Journal, Vol. 54, Pp. 877-883.

Kirchhoff, G.F. and Kirchhoff, Claudia

1976 Hidden Victimization by Sex Offenders: The Michigan Sample. Paper presented at the 2nd Annual International Symposium on Victimology, Boston, Sept. 5-11.

Klingman, Gerda I. and Goodall, McC.

1957 "Urinary epinephrine and levarterenol excretion during acute sublethal alcohol intoxication in dogs." J. Pharmac. and Exp. Ther., Vol. (121), No. 3, Pp. 313-318.

Koren, John

1916 Alcohol and Society. New York: Henry Holt and Company.

Kostowsk, W.; Rewerski, W. and Piechock, R.

1974 "Adrenal steroids and effects of some tranquilizers on aggressive behavior in mice." Pol. J. Pharmacol. Pharm., Vol. 26, No. 6, Pp. 591-593.

Krauweel, H.J.

1955 "Drinking and criminality in the Netherlands." JSA, Vol. 16, No. 2, Pp. 291-294.

Krohn, Marvin D.

1976 A Durkheimian Analysis of International Crime Rates. Paper presented at the 71st Annual Meeting, American Sociological Association, August.

Lahdenranta, Uolevi

1973 "Kodin piirissä sattuneiden tapaturmien tarkastelua." (A survey of accidents that happen at home.) Suomen Laakarilehti, Vol. 28. Pp. 1826-1832.

Lahti, Robert A. and Majchrowicz, Edward

1974 "Ethanol and acetaldehyde effects on metabolism and binding of biogenic amines." QJSA, Vol. 35, Pp. 1-14.

Lahti, Robert A.

1975 "Alcohol, aldehydes and biogenic amines." Pp. 239-254 in E. Majchrowicz (ed.), Biochemical Pharmacology of Ethanol, New York: Plenum Press.

Lanzkron, J.

1962-1963 "Murder and insanity: A survey." American Journal of Psychiatry, Vol. 119, Pp. 754-758.

Lawes, L.

1928 "Life and death in Sing Sing." World's Work, May, No. 56, Pp. 50-63.

Lenke, Leif

1976 "Alkohol och valdbrottslighet" (On Crimes of Violence and Alcohol) Alkohol och Narkotika, 70:1, Pp. 8-17; also commentary by Bjorn Hibell and Erland Jonsson, pp. 18-24.

Leppa, Seppo

1974 "A review of robberies in Helsinki in 1963-1973." Research Institute of Legal Policy, Publication No. 2, Helsinki.

- Le Roux, L.C. and Smith, I.S.
1964 "Violent deaths and alcoholic intoxication." Journal Forensic Medicine, Vol. 11, No. 4, p. 131.
- Leshner, Alan I. et al.
1973 "Pituitary adrenocortical activity and internal aggressiveness in isolated mice." Physiology and Behavior, Vol. 11, No. 5, Pp. 705-711.
- Leshner, A.I. and Johnson, A.E.
1974 "Effects of adrenalectomy on the aggressiveness of neonatally androgenized female mice." Physiol. Behav., Vol. 13, No. 5, Pp. 703-705.
- Levine, David (Ed.)
1964 Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press.
- Levy, J.E.
1969 "Navajo criminal homicide." Southwestern Journal of Anthropology, Vol. 25, Pp. 124-152.
- Lewis, A.P.R.
1944 "Alcohol as an alleged cause of loss of memory in younger delinquents." The British Journal of Inebriety, Vol. 42, Pp. 21-43.
- Lindelius, Rolf and Salum, Inna
1973 "Alcoholism and criminality." ACTA Psychiatrica Scandinavica, Vol. 49, Pp. 306-314.
- Lindelius, Rolf and Salum, Inna
1975 "Alcoholism and crime: A comparative study of three groups of alcoholics." JSA, Vol. 36, No. 11, Pp. 1452-1457.
- Lipscomb, W.
1971 "Drug use in a black ghetto." California Mental Health Research Digest, Vol. 9, No. 1, Pp. 28-29.
- Lombroso, Cesare, M.D.
1968 Crime Its Causes and Remedies. New Jersey: Patterson Smith Publishing Corp. (reprint)
- London, J. and Myers, J.K.
1961 "Young offenders: Psychopathology and social factors." Archives of General Psychiatry, Vol. 4, No. 3, Pp. 274-282.
- Lorenz, Konrad
1966 On Aggression. New York: Harcourt, Brace and World, Inc.
- Lowrance, William W.
1976 Of Acceptable Risk: Science and the Determination of Safety. Los Altos, California: William Kaufman, Inc.

- Loya, Fred
1971 "Victim-Precipitated Homicide: An Alternate Method of Suicide."
M.A. Thesis, University of Denver.
- Luke, James L.
1974 Office of the Chief Medical Examiner: Annual report of 1974,
Washington, D.C., Department of Human Resources, 1974, in Harper, 1976.
- Lunde, Donald T.
1976 Murder and Madness. San Francisco: San Francisco Book Co., Inc.
- Lyman, S.M. and Scott, M.B.
1970 A Sociology of the Absurd. New York: Appleton Century-Crofts.
- MacAndrew, Craig and Edgerton, Robert B.
1969 Drunken Comportment: A Social Explanation. Chicago: Aldine Pub-
lishing Co.
- MacCormick, A.H.
1963 "Correctional views on alcohol, alcoholism, and crimes." Crime
and Delinquency, Vol. 9, Pp. 15-28.
- Macdonald, John M.
1961 The Murderer and His Victim. Springfield: Charles C. Thomas
Publishers.
- Mader, R.
1965/66-1969/70 "Alkoholismus bei kriminellen Jugendlichen -- Eine
Vergleichsuntersuchung." Acta Paedopsychiatria, Vol. 39, Pp. 2-11.
- Madsen, W. and Madsen C.
1969 "The cultural stucture of Mexican drinking behavior." QJSA,
Vol. 30, Pp. 701-718.
- Magruder, Katheryn M.
1976 "The association of alcoholism mortality with legal availability
of alcoholic beverages." Journal of Alcohol and Drug Education, Vol.
21, Pp. 27-35.
- Maidkel, Roger P. (Ed.)
1967 Biochemical Factors in Alcoholism. New York: Pergamon Press
- Marek, Z.; Widacki, J. and Hanausek, T.
1974 "Alcohol as a victimogenic factor in robberies." Forensic Science,
Vol. 4, Pp. 119-223.
- Mark, Vernon H. and Ervin, Frank R.
1970 Violence and the Brain. New York: Harper and Row Publishers.

- Marrone, Robert L.; Pray, Sidney L. and Bridges, Cecil C.
1966 "Norepinephrine elicitation of aggressive display responses in
beta splendens." Psychon. Sci. Vol. 5, No. 5, Pp. 207-208.
- Martin, F.M.
1973 "Social and psychological aspects of alcohol and alcoholism."
Health Bulletin, Vol. 31, No. 6, Pp. 320-323.
- Martin, R.; Cloninger, C. and Guze, S.
1976 "Female criminality and the prediction of recidivism: A prospective
six-year follow-up." Unpublished paper from Washington University School
of Medicine, St. Louis, Missouri.
- Maule, H.G. and Cooper, Jane
1966 "Alcoholism and crime -- A study of the drinking and criminal habits
of 50 discharged prisoners." Brit. J. of Addiction, Vol. 61, Pp. 201-221.
- May, Carl
1927 "Survey of criminal statistics." Journal of Delinquency.
Vol. 11, No. 4, Pp. 279-293.
- Mayfield, D.
1972 "Alcoholism, Alcohol Intoxication and Assaultive Behavior."
Presented at the 30th International Congress on Alcoholism and
Drug Dependence, Amsterdam.
- Mayfield, D. and Allen, D.
1967 "Alcohol and effect: A psychopharmacological study." American
Journal of Psychiatry, Vol. 123, Pp. 1346-1351.
- McAdoo, William
1927 "Crime and punishment: Causes and mechanism of prevalent crimes."
Scientific Monthly, No. 24, Pp. 415-420.
- McCaghy, C.H.
1968 "Drinking and deviance disavowal; the case of child molesters."
Social Problems, Vol. 16, p. 43.
- McCord, Joan
1972 "Etiological factors in alcoholism: Family and personal
characteristics." QJSA, Vol. 33, Pp. 1020-1027.
- McCord, Joan
1976 "Patterns of Deviance." Presented at the Annual Meeting of the
Society for Life History Research in Psychopathology, Fort Worth, Texas.
- McCord, William; Howard, John; Friedberg, Bernard and Harwood, Edwin.
1969 Life Styles in the Black Ghetto. New York: W.W. Norton and
Co., Inc.
- McCord, W. and McCord, J.
1962 "A longitudinal study of the personality of alcoholics." Chapt. 24 in
D.J. Pittman and C.R. Snyder eds., Society, Culture and Drinking Patterns,
New York: John Wiley and Sons, Ltd.

McGeorge, John

1963 "Alcohol and crime." Med. Sci. Law., Vol. 3, Pp. 27-48.

McLain, W.C.; Cole, B.T.; Schreiber, R. and Powell, D.A.

1974 "Central catechol and indolamine systems and aggression." Pharmacol. Biochem. Behav., Vol. 2, No. 1, Pp. 123-126.

Medhus, Asbjorn

1975 "Criminality among female alcoholics." Scandinavian Journal of Social Medicine, Vol. 3, No. 2, Pp. 45-49.

Mendelson, Jack H.; Stein, Stephan and McGuire, Michael T.

1966 "Comparative psychophysiological studies of alcoholic and nonalcoholic subjects undergoing experimentally induced ethanol intoxication." Psychosomatic Medicine, Vol. 28, Pp. 1-12.

Menninger, Karl A.

1938 Man Against Himself. New York: Harcourt, Brace and Co.

Merton, Robert K. and Nisbet, Robert A.

1961 Contemporary Social Problems. New York: Harcourt, Brace and World, Inc.

Metropolitan Life Insurance Company

1939 Report cited in Wilentz, 1953.

Metropolitan Life Insurance Company

1958 Statistical Bulletin. September, New York.

Mills, C.W.

1959 The Sociological Imagination. Oxford: Oxford Books.

Modign, K.

1973 "Effects of isolation and fighting in mice on the rate of synthesis of noradrenaline, dopamine with 5-hydroxytryptamine in the brain." Psychopharmacologia, Vol. 33, No. 1, Pp. 1-17.

Mooney, W.C.

1974 "Alcohol and Public Safety: The Alcoholic Offender and the Criminal Justice System." In M.E. Chafetz, ed., Proceedings of the 4th Annual NIAAA Alcoholism Conference,

Moore, M. and Gray, M.G.

1942 "The management of the alcoholic probationer." J. Crim. Psychopath., Vol. 3, Pp. 465-476.

- Moore, E.C.
1897 "The social value of the saloon." American Journal of Sociology, Vol. 3, Pp. 1-12.
- Moses, Sylvia G. and Robins, Eli
1975 "Regional distribution of norepinephrine and dopamine in brains of depressive suicides and alcoholic suicides." Psychopharmacology Communications, Vol.], No. 3, Pp. 327-337.
- Moskowitz, Herbert
1973 "A behavioral mechanism of alcohol-related accidents."
- Moskowitz, Herbert
1973 "Laboratory studies of the effects of alcohol on some variables related to driving." Journal of Safety Research, Vol. 5, No. 3, Pp. 185-199.
- Moskowitz, H. and Burns, M.
1976 "Effects of rate of drinking on human performance." QJSA, Vol. 37, No. 5, Pp. 598-605.
- Moskowitz, H. and DePry, D.
1968 "Differential effect of alcohol on auditory vigilance and divided attention tasks." QJSA, Vol. 29, Pp. 54-62.
- Moyer, K.E.
1971 The Physiology of Hostility. Chicago: Markham Publishing Co.
- Moyer, Kenneth Evan
1976 Physiology of Aggression and Implications for Control: An Anthology of Readings. New York: Raven Press.
- Mulvihill, D.J.; Tumin, M.M. and Curtis, L.A. (eds.)
1969 Crimes of Violence. A staff report submitted to the U.S. National Commission on the Causes and Prevention of Violence. NCCPV Staff Study Series Numbers 11-13. Washington, D.C.: USGPO.
- Murphree, H.B. and Price, L.M.
1970 "Electroencephalographic effects of some alcoholic beverages." Chapter 8 in Robert E. Popham, ed., Alcohol and Alcoholism, Toronto: University of Toronto Press.
- Myerson, A.; Alexander, L. and Moore, M.
1942 "Alcoholic avitaminosis." Dis. Nerv. System, Vol. 3, Pp. 70-76.
- Myers, Martha
1976 "Determinants of conviction: The prosecutorial roles of the victim and the defendant." Paper submitted at the International Victimology Symposium, Sept. 5-11, Boston, Mass.

- Myrsten Anna-Lisa; Kelly Michael; Neri, Aldo and Rydberg, U.H.
1970 "Acute effects and after-effects of alcohol on psychological and physiological functions." Reports from the Psychological Laboratories University of Stockholm No. 314.
- Navratil, L.
1959 "On the etiology of alcoholism." QJSA, Vol. 20, Pp. 236-244.
- Neiberg, N.
1964 "Felons and Alcohol." Paper presented at the National Institute on Crime and Delinquency. Boston, MA.
- NIAAA
1975 Evaluative Data on NIAAA Evaluative Treatment Programs for Fiscal Year 1975. Program analysis and evaluation branch, October, 24 Pp.
- NIAAA
1974 "Alcoholic felon." Alcohol, Health and Research World, Summer, Pp. 17-23.
- Nicol, A.R.; Gunn, J.C.; Gristwood, J.; Foggitt, R.H. and Watson, J.P.
1973 "Relationship of alcoholism to violent behavior resulting in long-term imprisonment." British Journal of Psychiatry, Vol. 123, Pp. 47-51.
- Nicol, A.R.; Gunn, J.C.; Foggitt, R.H. and Gristwood, J.
1972 "The quantitative assessment of violence in adult and young offenders." Medicine, Science, and the Law, Vol. 12, Pp. 275-282.
- Nimmer, R.T.
1971 Two million unnecessary arrests. Chicago: National Bar Foundation.
- Normeandeau, A.
1968 Trends and Patterns in Crimes of Robbery. Ann Arbor, Michigan: University Microfilms International.
- Norvig, J. and Nielson, B.
1956 "A follow-up study of 221 alcohol addicts in Denmark." QJSA, Vol. 17, Pp. 633-642.
- O'Brien, J.E.
1971 "Violence in divorce prone families." Journal of Marriage and the Family, Vol. 33, Pp. 692-698.
- O'Donnell, J.A.; Voss, H.L.; Clayton, R.R.; Slatin, G.T. and Room, R.G.W.
1976 Young Men and Drugs -- A nationwide survey. NIDA Research monograph.
- O'Honlon, J.F. Jr.
1965 "Adrenaline and noradrenaline: Relation to performance in a visual vigilance task." Science, Vol. 150, No. 3695, Pp. 507-509.

- Palola, Ernest G.; Dorpat, Theodore L. and Larson, William W.
1962 "Alcoholism and suicidal behavior." Chapter in D. Pittman and C.R. Snyder, eds., Society, Culture and Drinking Patterns, New York: John Wiley and Sons, Inc.
- Partington, J.T. and Johnson, F.G.
1969 "Personality types among alcoholics." QJSA, Vol. 30, No. 1, p. 21.
- Pastore, N.
1952 "The role of arbitrariness in the frustration-aggression hypothesis." J. Abnorm. Soc. Psychol., Vol. 47, Pp. 728-731.
- Patkai, Paula
1970 "Catecholamine excretion in pleasant and unpleasant situations." Reports from the Psychological Laboratories, University of Stockholm, No. 294.
- Pavloff, George
1973 "Alcoholism and the Criminal Justice Population." Presented at NIAAA Seminar on "Alcoholism Detection, Treatment, Rehabilitation Within the Criminal Justice System." Washington, D.C., October 18-19.
- Penttila, Anitti; Tenhu, Martti and Kataja, Matti
1972 "Computer analyses of the clinical test performance results in the intoxication examination material utilizing the point counting system." Blutalkohol, Vol. 9, Pp. 260-269.
- Perman, E.S.
1958 "The effect of ethyl alcohol on the secretion from the adrenal medulla in man." Acta Physiol. Scand., Vol. 44, Pp. 241-247.
- Perman, E.S.
1961 "Effect of ethanol and hydration on the urinary excretion of adrenaline and noradrenaline and on the blood sugar of rats." Acta physiol. scand., Vol. 51, 68-74.
- Pernanen, Kai
1975 "Alcohol and crimes of violence," Chapter 10, Volume 4, pp. 351-444. In: Kissin and H. Begleiter eds., Biology of Alcoholism, New York: Plenum Press.
- Perper, J.A.
1976 "Sudden, unexpected death in alcoholics." Alcohol Health and Research World, Vol. 1, No. 1, Pp. 18-23.
- Persky, H.; Smith, K.D. and Basu, G.K.
1971 "Relation of psychologic measures of aggression and hostility to testosterone production in man." Psychosom. Med., Vol. 33, No. 3, P. 265.
- Pfautz, H. and Hyde, R.
1960 "The ecology of alcohol in the local community." QJSA, Vol. 21, Pp. 447-455.

- Piamonte, John S. and Hoge, Robert D.
 1973 "An investigation of the frustration-aggression relation in children." Canadian Journal of Behavioral Science, Vol. 5, No. 4
 Pp. 362-370.
- Pitkanen, L.
 1973a "An aggression machine II. Interindividual differences in the aggressive defense responses aroused by various stimulus conditions." Scandinavian Journal of Psychology, Vol. 14, No. 2, Pp. 65-74.
- Pitkanen, L.
 1973b "An aggression machine III. The stability of aggressive and nonaggressive patterns of behavior." Scandinavian Journal of Psychology, Vol. 14, No. 2, Pp. 75-77.
- Pittman, David J. and Gordon, C. Wayne
 1958 "Criminal careers of the chronic police case inebriate." JSA, Vol. 19, No. 2, Pp. 255-268.
- Pittman, David and Sterne, Muriel
 1962 "A Survey of Existing Community Attitudes and Resources in the Area of Alcoholism in Metropolitan St. Louis." a Preliminary Report, not for publication.
- Pittman, David J. and Handy, William
 1964 "Patterns in criminal aggravated assault." Journal of Criminal Law, Criminology, and Police Science, Vol. 55, No. 4, Pp. 462-470.
- Pittman, David J.
 1967 "Public intoxication and the alcoholic offender in American society." Appendix A. to President's Commission on Law Enforcement and Administration of Justice, Task Force Report: Drunkenness.
- Plant, M.A.
 1976 "Young drug and alcohol casualties compared: A review of 100 patients at a Scottish psychiatric hospital." Br. J. Addict., Vol. 71, Pp. 31-34.
- Pope, Carl E.
 1975 "Sentencing of California felony offenders." Analytic Report 6, U.S. Dept. of Justice, LEAA, National Criminal Justice Information on Statistics Service.
- Porterfield, A.L.
 1958 "Ecological correlates of alcoholism." Social Problems, Spring, Pp. 326-338.
- Porterfield, A.L.
 1960 "Traffic fatalities, suicide." American Sociological Reviews 25, Vol. 25, No. 6, Pp. 847-901.
- President's Commission
 1966 Report on the President's Commission on Crime in the District of Columbia. Washington, D.C.: U.S. Government Printing Office.

- Prewer, R.R.
1944 "Psychiatry in detention." Brit. Med. J., Vol. 2, Pp. 368-70.
- Proshansky, Eric and Bandler, Richard J. Jr.
1975 "Midbrain hypothalamic interrelationships in the control of aggressive behavior." Aggressive Behavior, Vol. 1, Pp. 135-155.
- Rada, Richard T.
1975 "Alcohol and rape." Medical Aspects of Human Sexuality, Vol. 9 No. 3, Pp. 48-65.
- Ratcliffe, S.; Melville, M.; Stewart, A. and Jacobs, P.
1970 "Chromosome studies on 3500 newborn male infants." Lancet, Vol. 1, Pp. 121.
- Ransford, H.E.
1968 "Isolation, powerlessness, and violence: A study of attitudes and participation in the Watts riot." American Journal of Sociology, Vol. 73, Pp. 581-591.
- Rathod, N.H.; Gregory, E. and Blows, D.
1966 "Two year follow-up study of alcoholic patients." Brit. J. Psychiat., Vol. 112, Pp. 683-92.
- Rathod, N.H. and Thomson, I.G.
1971 "Women alcoholics: A clinical study." QJSA, Vol. 32, Pp. 45-52.
- Raynes, A.E. and Ryback, R.S.
1970 "Effects of alcohol and congeners on aggressive response in *Betta Splendens*." QJSA, Suppl. No. 5, Pp. 130-134.
- Reis, Donald J.
1975 "Central neurotransmitters in aggressive behavior." Pp. 57-58 in William S. Fields and William H. Sweet, Neural Bases of Violence and Aggression, St. Louis: Warren H. Green Inc.
- Reis, Donald J and Fuxe Kjell
1968 "Depletion of noradrenaline in brainstem neurons during sham rage behavior produced by acute brainstem transection in cat." Brain Research, Vol. 7, No. 3, Pp. 448-451.
- Reis, Donald J. and Fuxe, Kjell
1969 "Brain norepinephrine: Evidence that neuronal release is essential for sham rage behavior following brainstem transection in cat." Proceedings of the National Academy of Sciences, Vol. 64, No. 1, Pp. 108-112.
- Reis, Donald J.; Miura, Mitsuhiki and Weinbreu, Marlene
1967 "Brain catecholamines: Relation to defense reaction evoked by acute brainstem transection in cat." Science, Vol. 156, No. 3783, Pp. 1768-1770.

- Reis, Donald J.; Moorhead, Dudley T. II and Merlino, Nancie
1970 "Dopa induced excitement in the cat." Arch Neurol. Vol. 22, No. 1,
Pp. 31-39.
- Reis, Donald J.; Moorhead, Dudley T. and Rifkin, Marlene
1971 "Changes in adrenal enzymes synthesizing catecholamines in attack
behavior evoked by hypothalamic stimulation in the cat." Nature, Vol. 229,
No. 5286, Pp. 562-63.
- Rich, Robert M.
1976 "The sociology of law: Toward a paradigmatic perspective."
Paper given at 71st meeting of the Amer. Soc. Assoc., Aug. 30-Sept. 3.
- Robert, Phillippe and Godefroy, Thierry
1973 "Alcoolisme et cout du crime." (Alcoholism and the cost of crime),
Bulletin de Médecin Légale et de Toxicologie Medical, (Lyon), Vol. 16,
No. 2, Pp. 77-91.
- Robins, Lee N.
1966 Deviant Children Grown Up. Baltimore: Williams and Wilkens, Co.
- Robins, Lee N.
1972 "An actuarial evaluation of the causes and consequences of
deviant behavior in young Black men." Merrill Roff, et al., eds.,
Life History Research in Psychopathology, Vol. 2, Minneapolis, MN.
- Robins, Lee, N.; Murphy, George, E. and Breckenridge, Mary B.
1967 "Drinking Behavior of Young Urban Negro Men." Presented at
meeting of American Sociological Association and the Society for the
Study of Social Problems, San Francisco.
- Robins, Lee N.; Bates, William M. and O'Neal, Patricia
1962 "Adult drinking patterns of former problem children." Pp. 395-412
in D.J. Pittman and C.R. Snyder eds., Society, Culture and Drinking
Patterns, New York: John Wiley & Sons, Inc.
- Robins, Lee and Guze, Samuel
1970 "Drinking Practices and Problems in Urban Ghetto Populations."
In Nancy Mello and Jack Mendelson, eds., Recent Advances in Studies in
Alcoholism, pp. 825-844. NIAAA, (HSM) 71-9045. Washington, USGPO.
- Robinson, C.B.; Patten, J.W. and Kerr, W.S.
1965 "A psychiatric assessment of criminal offenders." Medicine,
Science, and the Law, Vol. 5, No. 3, Pp. 140-146.
- Roebuck, J.B.
1962 "The negro drinker and assaulter as a criminal type." Crime and
Delinquency, Vol. 8, No. 1, Pp. 21-33.

Rolinski, Z.

1974 "Analysis of aggressiveness stereotype complex induced in mice by amphetamine or D., L-dopa." Polish Journal of Pharmacology and Pharmacy, Vol. 26, No. 3, Pp. 369-378.

Rolinski, Z.

1975 "Pharmacological studies on isolation induced aggressiveness in mice in relation to biogenicamines." Pol. J. Pharmacol. Pharm. Vol. 27, No. 1, Pp. 37-44.

Room, Robin

1972 "Drinking patterns in large U.S. cities." QJSA, Suppl. No. 6, Pp. 28-57.

Room, Robin

1975 "The Measurement and Distribution of Drinking Patterns and Problems in General Populations." For World Health Organization meeting, Geneva, July 28-Aug. 1, 1975.

Rosanoff, A.J.

1943 "Thirty condemned men." Amer. J. Psychiat. Vol. 99, Pp. 485-95.

Rosenberg, C.M.

1969 "Young alcoholics." Brit. J. Psychiat. Vol. 115, Pp. 181-8.

Ross, Christopher F.J.

1971 "Comparison of hospital and prison alcoholics." Brit. J. Psychiat., Vol. 118, Pp. 75-8.

Roth, Loren H.; Rosenberg, Nathan and Levinson, Robert

1971 "Prison adjustment of alcoholic felons." QJSA, Vol. 32, No. 2, Pp. 382-392.

Rothballen, Alan B.

1967 "Aggression, defense and neurohumors." Pp. 135-170 in C.D. Clemente and D.B. Lindsley (eds.), Aggression and Defense, Vol. V, Berkeley: University of California Press.

Roueche, Berton

1962 Alcohol. New York: Grove Press Inc.

Rowe, M.J.

1919 "Alcohol and crime." J. Delinqu., Vol. 4, Pp. 131-151.

Rowntree, Joseph and Sherwell, Arthur

1900 The Temperance Problem and Social Reform. London: Hodder and Stoughton.

- Ruff, C.F.; Ayeers, J. and Templer, D.I.
1975 "Alcoholics and criminals: Similarity of scores on the MacAndrew alcoholism scale." Psychological Reports, Vol. 36, Pp. 921-2.
- Sacoff, Robert L.
1973 "LSD, alcohol, and homicide." J. American Med. Assoc., Vol. 225, No. 9, p. 1123.
- Saint, E.G.
1969 "Alcohol and society." Medical Journal of Australia, Vol. 2, No.2, Pp. 69-76.
- Santa Clara Criminal Justice Pilot Program
1971 "Crime in San Jose." Technical Report, December.
- Sardesai, Vishwanath, M. (Ed.)
1969 Biochemical and Clinical Aspects of Alcohol Metabolism. Springfield: Charles C. Thomas Publisher
- Sauerhoff, Mitchell, W. and Michaelson, I. Arthur
1973 "Hyperactivity and brain catecholamines in lead-exposed developing rats." Science, Vol. 182, No. 4116, Pp. 1022-1024.
- Schacter, Stanley and Singer, Jerome E.
1962 "Cognitive, social and physiological determinants of emotional state." Psychological Review, Vol. 69, No. 5, Pp. 379-399.
- Schildkraut, Joseph J and Kety, Seymour S.
1967 "Biogenic amines and emotion." Science, Vol. 156. No. 3771 Pp. 21-30.
- Schmidt, W. and De Lint, J.
1972 "Causes of death of alcoholics." QJSA, Vol. 33, No. 1, Pp. 171-185.
- Schuckit, Marc A.
1973 "Alcoholism and sociopathy -- diagnostic confusion." QJSA, Vol. 34, Pp. 157-64.
- Schuckit, M.; Rimmer, J.; Reich, T. and Winokur, G.
1970 "Alcoholism: Antisocial traits in male alcoholics." Brit. J. Psychiat., Vol. 117, Pp. 575-76.
- Schuckit, M.A. and Winokur, G.A.
1972 "A short term follow-up of women alcoholics." Dis. Nerv. Syst., Vol. 33, Pp. 672-678.

- Schuckit, Marc A., and Gunderson, E.
1974 "Deaths among young alcoholics in the U.S. Naval Service." QJSA
Vol. 35; Pp. 856-862.
- Schumacher, D.
1923 "Alcohol as a cause of accidents." JAMA, Vol. 8, Pp. 2128-2129.
- Schur, Edwin, M.
1965 Crimes Without Victims. Englewood Cliffs, N.J.: Prentice Hall
Publishers.
- Schwartz, R.; Sackler, A.M. and Weltman, A.S.
1974 "Adrenal relationships to aggressiveness in isolated female mice."
Experientia, Vol. 30, No. 2, Pp. 199-200.
- Scott, P.D.
1968 "Offenders, drunkenness, and murder." British Journal of Addiction,
Vol. 63, Pp. 221-226.
- Segal, David S and Mandell, Arnold J.
1970 "Behavioral activation of rats during intraventricular infusion
of norepinephrine." Proceedings of the National Academy of Sciences,
Vol. 66, No. 2, Pp. 289-293.
- Seliger, Robert
1953 "Alcohol and crime." Journal of Criminal Law, Criminology, and
Police Science, Vol. 44, No. 4, Pp. 438-441.
- Selling, L.S.
1940 "The role of alcohol in the commission of sex offenses." Medical
Record, April 17, Pp. 289-291.
- Sethi, R.R.
1973 "Parent-child similarity in choice of response to frustrating
situations." Psychological Reports, Vol. 32, No. 3, (Pt. 2), Pp. 1227-1233.
- Shaw, Clifford
1930 The Jackroller. Chicago: Chicago University Press.
- Shohan, S.G.; Ben-David, S. and Rahav, G.
1974 "Interaction in violence." Human Relations, Vol. 27, No. 5,
p. 417.
- Shuntich, R.J. and Taylor, S.P.
1972 "The effects of alcohol on human physical aggression." Journal
of Experimental Research in Personality, Vol. 6, Pp. 34-38.
- Shupe, Lloyd M.
1954 "Alcohol and crime." Journal of Criminal Law, Criminology, and
Police Science, Vol. 44, No. 5, Pp. 661-664.

Silva, M.T.

1974 "Effects of adrenal demedullation and adrenalectomy on an active avoidance response of rats." Physiol. Psychol. Vol. 2, No. 2, Pp. 171-174.

Singer, Jerome L. (Ed.)

1971 The Control of Aggression and Violence. New York and London: Academic Press.

Sjoberg, L.

1969 "Alcohol and gambling." Psychopharmacologia, Vol. 14, Pp. 284-298.

Skelton, W.D.

1970 "Alcohol, violence behavior, and the EEG." Southern Medical Journal, Vol. 63, April, Pp. 465-466.

Skolnick, Jerome

1954 "A study of the relation of ethnic background to arrests for inebriety." QJSA, Vol. 15, No. 4, Pp. 622-630.

Slater, Hollis W.

1974 "On the etiology of criminal homicides -- The alcohol factor." Journal of Police Science and Admin., Vol. 2, No. 1, Pp. 50-53.

Slovenko, Ralph

1968 "Sexual deviation: Response to an adaptational crisis." U. Col. Law Review, Vol. 40, Pp. 222-241.

Smith-Morehouse, P.M. and Lynn, L.

1966 "Drinking before detention: A survey of the population of a senior detention center to ascertain if excessive drinking or alcoholism could be detected." Prison Serv. Journal, Vol. 5, No. 20, Pp. 29-39.

Snyder, LeMoyne

1944 Homicide Investigation. Springfield, Illinois: Charles C. Thomas, Publisher.

Soehring, Klaus and Schuppel, Rainer

1969 "Interactions between alcohol and drugs." Chapter 10 in Robert E. Popham ed., Alcohol and Alcoholism. Toronto: University of Toronto Press.

Spain, D.M.; Bradess, V.A. and Eggston, A.A.

1951 "Alcohol and violent death: A one year study of consecutive cases in a representative community." JAMA, Vol. 146, Pp. 334-335.

Stafford-Clark, D. and Taylor, F.H.

1949 "Clinical and EEG studies of prisoners charged with murder." Journal Neurol. Neurosurg. Psychiatry, Vol. 12, Pp. 325-330.

Sterne, M. and Pittman, D.

1972 "Drinking patterns in the ghetto." Social Science Institute, Vol. 2, Pp. 545-576.

- Stearns, A.W.
1925 "Homicide in Massachusetts." American Journal of Psychiatry, Vol. 4, Pp. 725-749.
- Steward, O.
1964 "Questions regarding American Indian criminality." Human Organization, Vol. 23, No. 1, Pp. 61-66.
- Stolk, J. Mm.; Connor, R.L.; Levine, S. and Borchas, J.D.
1974 "Brain norepinephrine metabolism and shock-induced fighting behavior in rats. Differential effects of shock and fighting on neurochemical response to a common foot-shock stimulus." Journal of Pharmacology and Experimental Therapeutics, Vol. 190, No. 2, Pp. 193-209.
- Strasser, S.
1974 "Animal aggression and technical aggression, critique of recent theories." International Philosophical Quarterly, Vol. 14, No. 2, Pp. 223-228.
- Suchman, Edward A.
1970 "Accidents and social deviance." J. of Health and Soc. Behavior, Vol. 11, No. 1, Pp. 4-15.
- Sutherland, Edwin H. and Cressey, Donald R.
1960 Principles of Criminology. Chicago: J.B. Lippincott Co.
- Taft, Donald R.
1956 Criminology. New York: The MacMillan Co.
- Tappan, Paul W.
1960 Crime, Justice and Correction. New York: McGraw-Hill Book Co. Inc.
- Tardif, G.
1966 "La criminalité de violence." M.A. Thesis, University of Montreal.
- Tarter, Ralph E.; Jones, Ben M.; Simpson, C. Dene and Vega, Arthur
1971 "Effects of task complexity and practice on performance during acute alcohol intoxication." Perceptual and Motor Skills, Vol. 33, Pp. 307-318.
- Taylor, S.P. and Ganmon, C.B.
1975 "Effects of type and dose of alcohol on human physical aggression." Journal of Personality and Social Psychology, Vol. 32, No. 1 Pp. 169-175.
- Templeton, T. D'Arcy
1975 "Alcohol and human aggression: A discussion of the direct link emphasis." Paper prepared for a workshop sponsored by non-medical use of drugs directorate in Vancouver, B.D.

- Tharp, Van K.; Rundell, O.H., Jr.; Lester, Boyd K. and Williams, Harold L.
1974 "Alcohol and secobarbital: Effects on information processing." in M.M. Gross ed., Alcohol Intoxication and Withdrawal, New York: Plenum Publishing Corp., Pp. 537-552.
- Tharp, Van K.; Rundell, O.H., Jr.; Lester, Boyd K. and Williams, Harold L.
1974 "Alcohol and information processing." Psychopharmacologia, Vol. 40, Pp. 33-52.
- Thompson, G.N.
1956 "Legal aspects of pathological intoxication (alcoholic insanity.)" J. Social Therap., Vol. 2, Pp. 182-187.
- Thum, D.; Wechsler, H. and Demone, H.W.
1973 "Alcohol levels of emergency service patients injured in fights and assaults." Criminology, Vol. 10, No. 4, Pp. 487-496.
- Tinklenberg, Jared R.
1973_a "Alcohol and violence." Pp. 195-210 (Chapter 8) Peter Bourne and Ruth Fox eds., Alcoholism: Progress, Research and Treatment, New York: Academic Press.
- Tinklenberg, Jared, R.
1973_b "Drugs and crime." National Commission on Marihuana and Drug Abuse, Drug Use In America: Problem in Perspective, Appendix: Technical papers of the second report, Vol. 1, pp. 242-299. Washington: USGPO.
- Tokuhata, G.K. et. al.
1971 "Alcohol sales and socioeconomic factors related to cirrhosis of the liver mortality in Pennsylvania." HSMHA Health Reports 86:3, pp. 253-264.
- Tripkovic, Dobroslov
1967 "Problem drinkers in the penitentiary at Sremska Mitrovica." QJSA, Vol. 28, Pp. 738-741.
- Twaddle, Andrew C.
1976 "On Crime and Sickness." Paper presented at the 71st meeting of the Amer. Soc. Assoc., New York.
- Ungerstedt, U.
1971 "Adipsia and aphagia after G-Hydroxydopamine induced degeneration of the nitro-striatal dopamine system." Acta physiol. scand. Supp. 3,67.
- U.S. Dept. of HEW Public Health Service
1971 Alcohol and Health. Special Report to the U.S. Congress.
U.S. Gov't. Printing Office.
- U.S. Department of HEW, Public Health Service
1964 Smoking and Health. Report of the Advisory Committee to the Surgeon General of the Public Health Service.

U.S. Department of Justice, LEAA, National Criminal Justice Information and Statistics Service

1975 "Census of State Correctional Facilities 1974 Advance Report." NPS Special Report, July.

U.S. Department of Justice, Law Enforcement Assistance Agency, National Criminal Justice Information and Statistics Service

1975a "Criminal Victimization Surveys in 13 American Cities."

U.S. Department of Justice, Law Enforcement Assistance Administration

1975b "Sentencing of California felony offenders." National Criminal Justice Information and Statistics Service, Analytic Report 6.

U.S. National Commission on the Causes and Prevention of Violence

1969 Law and Order Reconsidered. Report of the Task Force on Law and Law Enforcement to the National Commission on the Causes and Prevention of Violence.

Valenstein, Elliot S.

1973 Brain Control. New York: Wiley & Sons Inc.

Valkonen, Tapani

1969 "Individual and structural effects on ecological research." Chapter 3 in M. Dogan and S. Rokkan, eds. Quantitative Ecological Analysis in the Social Sciences, Cambridge: MIT Press.

Valzelli, L.

1967 "Drugs and aggressiveness." Pp. 79-103 in S. Garvatini and P.A. Shone, (eds.), Advances in Pharmacology, Vol. 5, New York: Academic Press.

Verhaege, A. And Schodet, R.

1959 "Considerations sur les dosages d'alcoolemie par prelevement systematique chez les blesses." Lille Med., Vol. 4, p. 866.

Virkkunen, M.M.D.

1974 "Alcohol as a factor precipitating aggression and conflict behavior leading to homicide." Br. J. Addict., Vol. 69, Pp. 149-154.

Vogel-Sprott, M.D.

1967 "Individual differences in the suppressing effect of punishment on a rewarded response in alcoholics and nonalcoholics." QJSA, Vol. 28, Pp. 33-42.

Von Hentig, Hans

1948 The Criminal and His Victim. New Haven: Yale University Press.

Voss, Harwin L. and Hepburn, J.R.

1968 "Patterns in criminal homicide in Chicago." J. Criminal Law, Criminology, and Police Science, Vol. 59, Pp. 499-508.

- Voss, Harwin L. and Peterson, David M. (eds.)
1971 Ecology, Crime and Delinquency. New York: Appleton-Century-Crofts.
- Voss, Harwin L. and Stephens, Richard C.
1973 "Criminal history of narcotic addicts." Drug Forum, Vol. 2 No. 2, Pp. 191-202.
- Walker, Nigel
1971 Crimes, Courts, and Figures. London: Cox and Wyman, Ltd.
- Wallace, Samuel
1965 Skid Row as a Way of Life. Totawa, New Jersey: Bedminster Press.
- Waller, Irvin
1974 Men Released from Prison. Toronto and Buffalo: University of Toronto Press.
- Wallgren, H. and Barry H.
1970 Actions of Alcohol, Amsterdam: Elsevier Publishing Co., 2 vols.
- Ward, David A.; Jackson, Maurice and Ward, Renee
1969 "Crimes of violence by women." See Mulvilhill, D.J., et al., 1969.
- Washbrook, R.A.H.
1976 "The criminology of the chronic alcoholic offender." Journal of Alcoholism, Vol. 11, No. 1, Spring, Pp. 9-20.
- Wasikhongo, Joab
1976 "Uniformities in aggravated assaults in St. Louis, Mo. and Mombasa, Kenya." International Journal of Criminology and Penology, Vol. 4, No. 1, Pp. 9-24.
- Watt, A.C.
1955 "Alcohol and crime." Journal of Forensic Medicine, Vol. 2, Pp. 164-169.
- Wechsler, H.; Kasey, E.H.; Thum, D. and Demone, H.W.
1969 "Alcohol level and home accidents." Public Health Reports, Vol. 84, December, Pp. 1043-1050.
- Weiner, Sheldon and Weaver, L.
1974 "Begging and social deviance on skid row." QJSA, Vol. 35, Pp. 1307-1315.
- Weiss, N.S.
1976 "Recent trends in violent deaths among young adults in the U.S." Am. J. Epidemiology, Vol. 103, No. 4, Pp. 416-422.
- Weitz, M.K.
1974 "Effects of ethanol on shock-elicited fighting behavior in rats." QJSA, Vol. 35, No. 3-A, Pp. 953-958.

- Welch, Bruce L.; Hendby, Edith T. and Turck, Ibrahim
 1974 "Norepinephrine uptake into cerebral cortical synaptosomes after one fight or electroconvulsive shock." Science, Vol. 183, No. 4121, Pp. 220-221.
- Welch, Bruce L. and Welch, Annemarie S.
 1965 "Effect of grouping on the level of brain norepinephrine in white swiss mice." Life Sciences, Vol. 4, No. 9, Pp. 1011-1018.
- Wenger, P.
 1944 "History of a drinking habit in 400 inmates of a penal institution." New York State Journal of Medicine . Vol. 44, Pp. 545-576.
- West, D.J.
 1963 The Habitual Prisoner. London: MacMillan & Co., Ltd.
- West, D.J.
 1968 "A note on murders in Manhattan." Medical Science Law, Vol. 8, p. 249.
- Westermeyer, Joseph
 1972a "A comparison of Amok and other homicides in Laos." American Journal of Psychiatry, Vol. 129, Pp. 703-709.
- Westermeyer, Joseph
 1972b "Violent death and alcohol use among the Chippewa in Minnesota." Minnesota Medicine, Vol. 55, No. 8, August, Pp. 549-552.
- Westermeyer, Joseph and Bearman, Jacob
 1973 "A proposed social indicator system for alcohol-related problems." Prev. Med., Vol. 2, No. 3, November, Pp. 438-44.
- Whalen, Richard E. (Ed.)
 1967 Hormones and Behavior. Princeton, New Jersey: D. Van Nostrand Co. Inc.
- Whalen, Richard E. (Ed.)
 1974 The Neuropsychology of Aggression. New York and London: Plenum Press.
- Whalen, R.P. and Lyons, J.J.
 1962 "Medical problems of 500 prisoners on admission to a county jail." Public Health Reports, Vol. 77, No. 6, Pp. 497-502.
- Whitehurst, R.M.
 1971 "Violence potential in extramarital sexual responses." Journal of Marriage and the Family, Vol. 33, Pp. 683-691.

Wiklund, D.

1947 "Alcoholism and crime. Swedish methods for dealing with criminal and other anti-social inebriates." Howard J. of Penology, Vol. 7
Pp. 121-126.

Wilentz, W.C.

1953 "The alcohol factor in violent deaths." American Practitioners Digest of Treatment, Vol. 4, Pp. 21-24.

Wilentz, W.C. and Brady, J.P.

1961 "The alcohol factor in violent deaths" Amer. Practit. Dig. Treat., Vol. 12, Pp. 829-835.

Williams, D.

1969 "Neural factors related to habitual aggression." Brain, Vol. 92, p. 503-520.

Wilson, B.

1958 "A survey of blood alcohol testing in victim." Med. J. Aust., Vol. 45, Pp. 13-15.

Wines, Frederic H. and Koren, John

1897 The Liquor Problem in its Legislative Aspects. Boston: Houghton Mifflin Co.

Winkler, E.G.; Weissman, M. and McDermain, G.

1954 "Alcoholism and anti-social behavior." The Psychiatric Quarterly, Vol. 28, No. 1, Pp. 242-254.

Winokur, George; Rimmer, John and Reich, Theodore

1971 "Alcoholism IV: Is there more than one type of alcoholism?" Brit. J. Psychiat., Vol. 118, Pp. 535-41.

Wolfgang, M.E. and Strohm, R.B.

1956 "The relationship between alcohol and criminal homicide." QJSA, Vol. 17, Pp. 411-425.

Wolfgang, M.E.

1958 Patterns in Criminal Homicide. Pennsylvania: Pennsylvania University Press.

Wolfgang, M. and Ferracuti, F.

1967 Subculture of Violence. London, New York: Tavistock Publications

Wurtman, Richard J.

1965 "Catecholamines." New England Journal of Medicine, Vol. 273, No. 12, Pp. 637-646; No. 13, pp. 693-700; No. 14, pp. 746-753.

Zeiner, Arthur R.

1974 "Physiological concomitants of the alcohol state: Arousal or relaxation." Alcohol Technical Reports. Vol. 2, No. 5, Pp. 78-86.

Ziskin, Jay

1976 Coping with Psychiatric and Psychological Testimony. Second Edition. Beverly Hills: Law and Psychology Press.

Zylman, Richard

1973 "Time of day as a factor in collision-involvement of drunken drivers." QJSA, Vol. 34, Pp. 527-529.

LATE ADDITIONS

Roizen, Ronald

1975 "Drinking and drinking problems: Some notes on the ascription of problems to drinking." Social Research Group Paper E36, Berkeley: Social Research Group.

1974 "Naming names: A note on drinkers' self-characterizations." Drinking and Drug Practices Surveyor 9, August, pp. 18-20, 44.

Roizen, Judy

1977 "Alcohol as an excuse for crime: A reevaluation of the deviance disavowal hypothesis." Social Research Group Working Paper, forthcoming.

Levine, Harry Gene

1977 "Colonial and nineteenth century American thought about liquor as a cause of crime and accidents." Social Research Group Paper E48, Berkeley: Social Research Group.

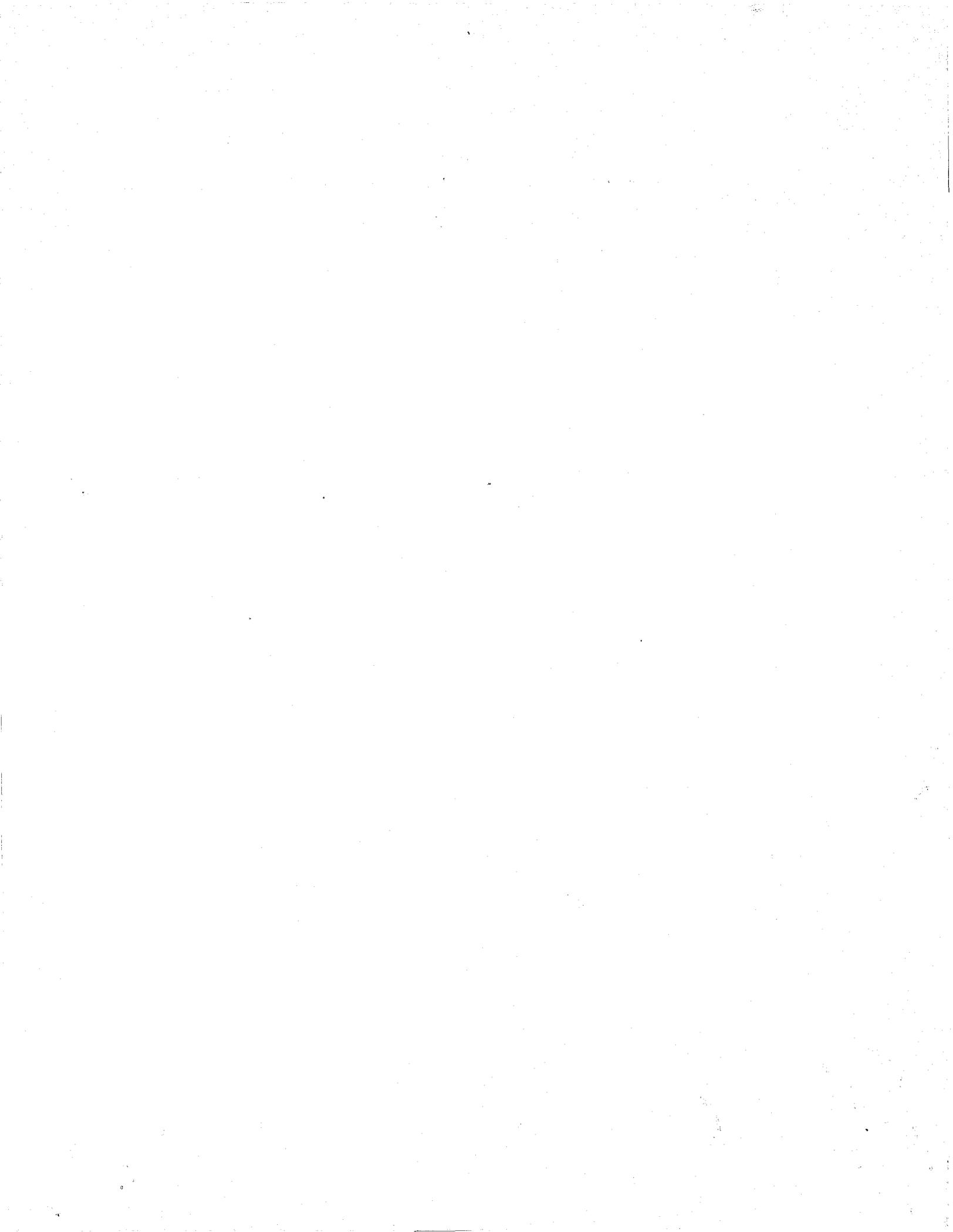
Gelles, Richard J.

1972 The Violent Home, Beverly Hills: Sage.

Gerson, Lewis

1976 "Drug Related Problems in Hamilton-Wentworth." Department of Clinical Epidemiology and Bio-Statistics, McMaster University, Hamilton, Ontario.

- Cahalan, Don and Treiman, Beatrice
1976 Drinking Behavior, Attitudes and Problems in San Francisco.
Report prepared for the Bureau of Alcoholism, Department of Public
Health, City and County of San Francisco, January.
- Sutherland, Edwin H. and Locke, Harvey J.
1971 Twenty Thousand Homeless Men: A Study of Unemployed Men in
the Chicago Shelters. New York: Arno Press and the New York Times.
- Parker, Elizabeth
1977 "Psychological Effects of Alcohol in Humans," Report
Prepared for Alcohol and Health III.
- Frosh, Jack and Bromberg, Walter
1939 "The Sex Offender -- A Psychiatric Study." American Journal
of Orthopsychiatry, Vol. IX, No. 4, (October), pp. 761-776.
- Glueck, Bernard C., Jr.
1956 Final Report, Research Project for the Study and Treatment
of Persons Convicted of Crimes Involving Sexual Aberrations,
June 1952 to June 1955. New York: State Department of Hygiene.
- Ellis, Albert and Brancale, Ralph
1956 The Psychology of Sex Offenders. Springfield, Illinois:
Thomas.
- Apfelberg, Benjamin; Sugar, Carl; Pfeffer, Arnold Z.
1944 "A Psychiatric Study of 250 Sex Offenders." American
Journal of Psychiatry, 100 (May), p. 762-770.
- Shaskan, Donald
1939 "One Hundred Sex Offenders." American Journal of Ortho-
psychiatry, Vol IX (July) p. 565-569.



CHAPTER FIVE

ALCOHOL AND SUICIDE

by

Marc Aarens

Ron Roizen

TABLE OF CONTENTS

	<u>Page</u>
Introduction	468
A. Theories and Patterns of Suicide	469
B. Alcohol and Suicide	476
a. Alcohol Use in Suicidal Acts	477
b. Drinking Histories of Suicides	483
c. Incidence of Suicide Among Labelled Alcoholics	500
C. Conclusions	506
Bibliography	513

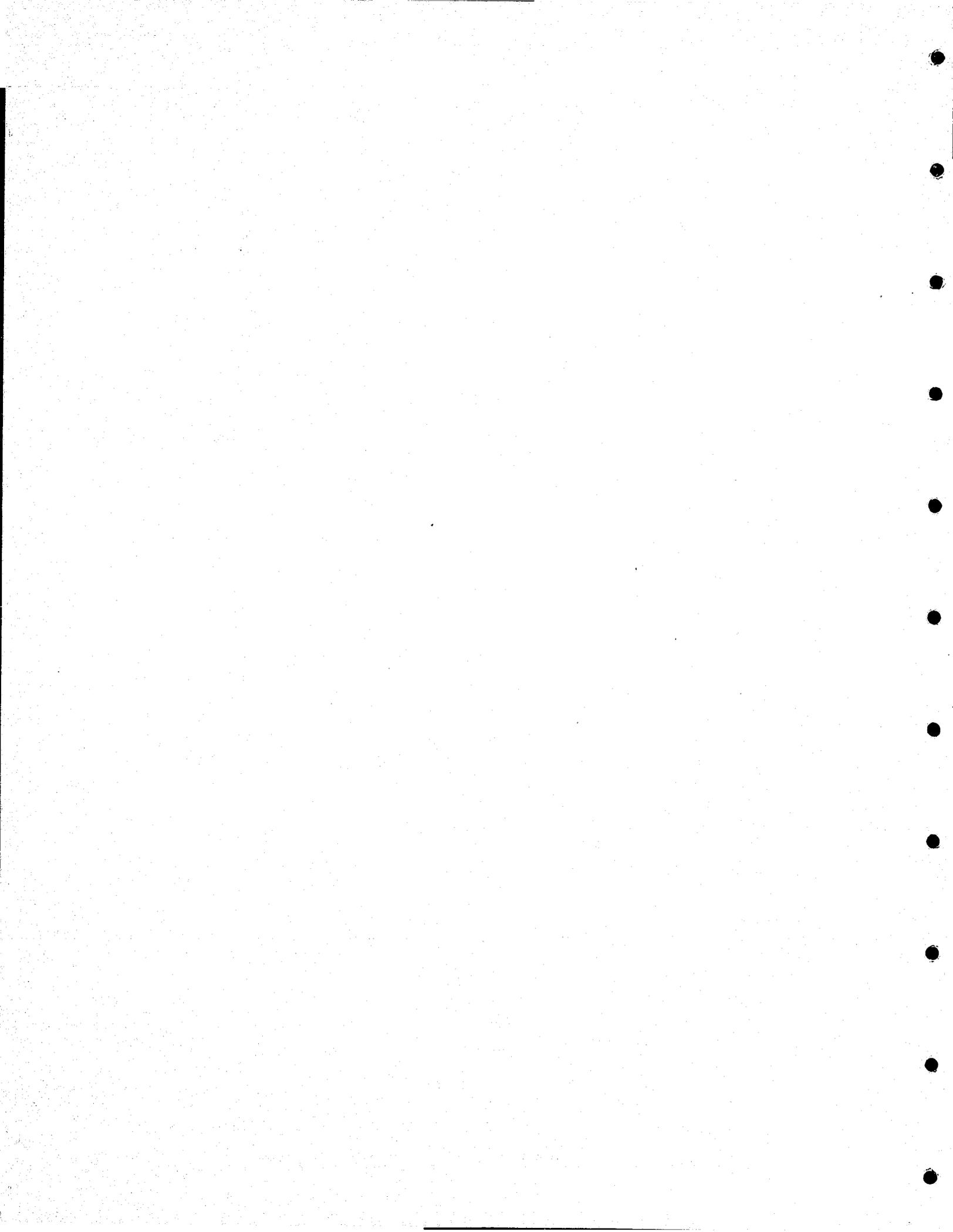
Introduction

But there is a special psychopathic state to which for some time it has been the custom to attribute all the ills of our civilization. This is alcoholism. Rightly or wrongly, the progress of insanity, pauperism, and criminality have already been attributed to it. Can it have any influence in the increase of suicide?

--Durkheim, 1897

Concerning alcohol misuse and suicide, it is difficult to establish about which phenomenon modern science knows less. Thus, to claim a relationship between the two either may be regarded as a step toward reducing the darkness or, on the other hand, as compounding our ignorance. One hundred and fifty years of research on the possible connections between alcohol and suicide has created an extensive literature that is rife with contradictions. One researcher came to conclude: "Among alcoholic cases, the care of those who are suicidal is a negligible problem" (Moore, 1939a, p. 691), while another stated, "It is probably no exaggeration to state that the chances of an Anglo-Saxon or Scandinavian alcoholic taking his own life are greater than his chances of dying of all the physical complications of alcohol combined" (Kendell and Staton, 1966, p. 38).

There are by now numerous statistical and demographic analyses indicating the correlations and distributions of suicidal behavior; there are elaborate and sweeping theoretical formulations, often with little connection with observable phenomena; there is in addition a long common-sense tradition on the subject, the notion dating from the temperance movement that suicide is the last step of the drunkard's progress. With all the data and speculation, the question Durkheim posed must still be considered: How does alcohol affect the magnitude of the suicide problem in our society? The answer to this may be as ambiguous and problematic as the behavior it would explain.



A. Theories and Patterns of Suicide

Suicide is neither an accident nor a crime (though in the past it has been considered so); it possesses both intentional and accidental features. The very ambiguity of this subject is apparent in all its aspects, and contributes to the great difficulty we have in understanding it. The limits of suicidal behavior are unclear. Some theorists have tried to broaden the notion of "suicidal behavior" to take in events less definitive than a suicidal act; such self-destructive behavior as thinking about suicide, accident proneness, and drug addiction have all been included. Most researchers concerned with suicide consider only definitive suicidal acts as being under their purview, perhaps best defined as deliberate acts of self-damage which the person committing cannot be sure to survive. Such acts may be related to longer term life processes of self-destruction or they may be impulsive reactions to the stress of the moment. The variation in seriousness, in precipitating events, in timing, in intent among suicidal people challenge the efforts of researchers to make sense of this behavior.

The subject of suicide has had a long and varied history in Western society. For centuries condemned as a sin and regarded as a crime, only relatively recently has it been looked upon as a social problem to be studied and understood. Some early statistical and psychological studies were done in Europe at the same time that suicide victims were still dealt with by the traditional means of being left to rot on the public gallows or buried at a crossroads with a stake through their heart. Some of the important psychiatric studies done in the 1950s were based on samples of convicts who had been imprisoned for attempting suicide.

As a subject, suicide attracted the attention of early scientific investigators, resulting in pioneering studies that helped to establish the structure of modern social science. Freud's studies of suicide, aggression, and melancholy form an important, if controversial, basis for his psychoanalytic theory of instincts (Freud, 1957); Durkheim's work Le Suicide is one of the seminal studies in sociology (Durkheim, 1951).

Following in the tradition of Durkheim, the sociological school studied suicide as a social phenomenon, reflecting the social structure and the social integration of individuals. Sociological investigators of suicide have tended to concentrate on the context of the act--the social factors, conditions, settings--that influence the incidence of suicide. Essentially, they ask the question how and why does the suicide rate vary in different populations. Sociologists have considered a wide collection of social variables in their attempts to isolate influences, looking at such items as age, sex, marital status, religion, occupation, ethnic background, social class, method of suicide, time of day, day of week, and weather. Data for these studies most often have come from records of completed suicides.

The psychological school's approach to suicide is very different in that it emphasizes the life history of the individual as the major topic of focus. Psychologists have derived most of their data from interviews with attempted suicides, typically small samples seen in hospitals. The psychologists who do these studies are usually interested in making a diagnosis, relating the suicidal behavior to other aspects of the person's mental state, background, and problems.

Beginning in the 1950s and 1960s, the new school of suicidology developed aiming to bridge the gap between the separate concerns of the psychologists

and sociologists, while adding a strong commitment to the fundamental objective of preventing suicide. This new concern was manifested in the establishment of suicide prevention centers; these in turn created new institutional needs to identify risk factors among their clients. Much of the new research utilized older techniques in new ways. For example, suicidologists developed psychological autopsies as a way of trying to gain psychological data on completed suicides, interviewing friends and relatives of the suicide in order to reconstruct his last days. In doing this, investigators have been interested in learning more than demographic data about the act, looking for information on the state of mind of the person, what warnings were given of the impending plan, and what could have been done to intervene. On the other hand, suicidologists have also done large scale studies of suicide attempts, looking at much larger samples than in the earlier psychiatric literature to learn more about the social context of attempts (Shneidman and Farberow, 1965).

The vital statistics of suicide indicate its prevalence in our society. In 1972, 25,000 people were certified as having killed themselves in the United States, making suicide the eleventh largest cause of death in common classifications. The overall annual suicide rate in the U.S. is 12 per 100,000, a rate that has not varied much since 1940. This rate is more than five times as large as the reported rate in a low suicide country such as Ireland, while the U.S. rate is about one-third that of a high suicide country like Hungary.

The rate is not constant across the population as a whole. There are variations in suicide rates by geographical region (west and mountain states, high; south and midwest, low) and season of the year (spring, high;

winter, low). But these rate variations are within a relatively narrow range, between 9 and 15 per 100,000. The variations in suicide rates by demographic characteristics, however, are much greater.

Men are far more likely to kill themselves, or at least to be certified as suicides, than women. Seventy-one percent of suicide victims are male, about the same ratio of men to women found in traffic fatalities, and slightly less than the seventy-five-twenty-five percent ratio seen in homicide victims. Unlike these other casualties, suicide rates are higher in the white population and among the older age groups. While the general suicide rate of blacks is about one-half that of whites, the peak rates for black males occur between 20 and 30 years of age, when the rate actually exceeds the rate of white males, whereas the white suicide rate increases with age and reaches a peak among those over 60. Of the other demographic characteristics routinely presented in public health statistical compendia, marital status has the strongest relationship with suicide: in the population 15 and over, married individuals show an age-adjusted rate of 12; never-marrieds, 21; widowed, 24; and divorced, 40 (Vital Statistics of the U.S., 1976).

Other factors that have been shown to affect the suicide rate include occupation, with certain professions such as doctors, engineers, and policemen having high rates; certain social subgroups such as mental patients and drug addicts also show high rates. There is no known characteristic, however, that strongly predicts suicide and in even the most vulnerable subpopulations, suicide accounts for only a minority of deaths.

Statistics on suicide and the differences among them must not be taken at face value. Suicide has long been considered the most negative form of death; a suicide attempt unleashes guilt in the friends and family of the victim--

as is often intended by the victim. The desire to minimize shame and guilt for those affected has a profound effect on the certification of suicide in official records, particularly since there is often a legal presumption against labelling a death as suicide if the circumstances have any ambiguity. The great variation in deaths registered as suicides under different jurisdictions are partially a reflection of this reporting artifact. The low suicide rates typical of Catholic countries may be partially a reflection of the extreme reluctance of medical examiners to label a death a suicide where there are strong religious and legal strictures against suicide. The discrepancy in rates between men and women noted in all countries may partly reflect a protective paternalism toward the dead woman's honor, and partly be due to the ambiguity inherent in women's common choices of means for death. While men more often choose violent means such as shooting, women are more likely to poison themselves with drugs, in circumstances where there are no witnesses, no marks of violence, and the possibility that death will be labelled accidental rather than suicidal.

These difficulties of definition and biases in reporting apply also when the focus shifts to attempted suicide. In this area, however, there is the further difficulty that there is no obvious definition of the event; at least a study of completed suicides can start from the fact of death, however ambiguous its circumstances. In many studies, the definition of attempted suicide is effectively in lay or clinical hands: attempted suicides are those who turn up in a hospital labelled as such. Behind the process which brought them there is usually a suicide threat which someone has interpreted seriously; thus the proximate "event" is often verbal rather than physical.

The study of attempted suicides has been motivated by a desire to under-

stand the process of completed suicide, and suicide attempts were originally thought to be merely failed suicides. But there seems, in fact, to be a qualitative difference between fatal and non-fatal suicidal acts: to some extent they are engaged in by different populations with different intentions.

Attempted suicide is a much more common occurrence than completed suicide; a Los Angeles study found eight times the number of attempted as completed suicides in one year (Shneidman and Farberow, 1965), while other investigators feel this is an understatement, considering 10 or 15 to 1 to be a truer ratio (Rüegsegger, 1963). In a large number of studies done in several countries, the comparisons show that attempters tend to be younger than completors, include a higher proportion of women, use less lethal methods (predominately drug overdoses), and demonstrate more ambiguity in their suicidal behavior (not leaving a note, making the attempt at a time and place where they are likely to be found in time). Suicidologists suggest that suicide attempts are often cries for help rather than wishes to die. Attempters often are attempting to demonstrate the seriousness of their psychological pain as a means of exerting leverage to improve their life situation.

Nevertheless, suicide attempts should not be thought of merely as gestures for attention or symbolic appeals for love. They can indicate a serious propensity for self-destructive behavior. While only about 10% of the people who attempt suicide do go on eventually to kill themselves, a large proportion of people who commit suicide will have made one or more attempts previously. A history of having had a suicide attempt is an important predictor for suicide.

Despite a long tradition of study, the field of suicide research has often failed to move beyond a timid effort at collecting data to developing theories and models of suicidal behavior that can be of use to those who

would understand this behavior and to those who would prevent it. Among the harshest critics of the work done in the field are those researchers who feel frustrated in trying to understand this subject with the data available.

One writes:

The monotonous regularity with which the same types of data are reported and the same stereotyped conclusions inferred from information organized in a fashion whose methodological error has long been demonstrated is only rarely broken by original ventures beyond the conventional. Indeed, most of the literature does not even qualify as research in the sense of any deliberate hypothesis testing or careful evaluation of the theoretical alternatives implicit in a specific set of events associated with a suicide or group of suicides.

Polemics alternate with appeals to the self-evident nature of assumptions. Abbreviated reports generally do not even have a point of common reference. This apathetic caricature of scientific contribution is the most obvious single fact emerging from a reasonably conscientious review of the medical suicide literature (M.J. Kahne, 1966, p. 182).

Some critics of the suicide literature have argued that the main problem with studies in the field is that researchers often lack a theoretical rationale for doing their studies. That is, they do not try to develop or test theories with their data. The problems of the field form a vicious circle; with faulty data, theories cannot be verified, and without well-thought out hypotheses, good data is not collected.

The apparent rationale behind most suicide studies is to see how the suicidal population differs from a normal population. As mentioned above, there are serious problems inherent in this because of the incompleteness of suicide rates and the difficulties of capturing representative populations. Despite these difficulties, such studies could be useful in pinpointing important differences in the suicidal population, indicating groups or personality types that are at special risk. The appropriate technique for

making these determinations is to employ a matched control group. Few studies of suicides have used this elementary procedure; those studies that have employed it usually have not clearly specified the groups being controlled, or else the groups used are other small clinical samples rather than a matched general population sample. Demographically matched control samples would be especially valuable in understanding the role of alcohol problems in suicide, since the prevalences of alcohol problems are strongly influenced by demographic and other factors. Such a general comparative study has not previously been done on a sample of suicides; preliminary results from such a comparison are presented later in this discussion.

B. Alcohol and Suicide

The suspicion that alcohol and alcoholism have something to do with suicide has a long history, and it has spawned much empirical research. For the most part, these studies have been of three types: examinations of drinking around the time of the suicidal act, examinations of drinking history among suicides, and examinations of the potential for suicide among samples of alcoholics. These studies have generated large amounts of data. It is important to remember, however, that the data was gathered in different countries, at various times, for different purposes, using varying definitions of alcohol variables, employing a multitude of methodologies, and often looking at very small samples. All these considerations have influenced the results obtained and make it difficult to ascertain what relationships do exist between the short and long term effects of alcohol on suicidal behavior. By examining what this research has found and some of the implications that have been derived from it, perhaps some perspective on this problem can be obtained.

a. Alcohol Use in Suicidal Acts

The literature on suicide has tended to consider the suicidal act as representing an end to a stream of events, situations, and predispositions in the life of the person; thus, the studies of alcohol and suicide have most often looked at the victim's life patterns in using alcohol instead of drinking done at the time of the act. This view of the problem may be too one-sided, as research does suggest that alcohol use itself may well be implicated in the occurrence of suicide acts.

Alcohol use is frequently involved in suicide attempts and in completed suicide. In Table S-1 and S-2, the range of involvement is from 3-45% in suicides, and 15-64% of the sample in attempted suicides. It should be noted that many of these measures do not use BAC tests, but rather witnesses' reports, self-reports, or unspecified criteria. The extent of intoxication during suicide attempts may well be vastly understated; in one study, in a sample of fifty suicide attempters admitted to a general hospital in Australia, seven (14%) admitted that they had been intoxicated. However, blood samples taken on arrival had indicated that 34% had a BAC of .05 - .15% and 28% had BACs above .15%. The attempters felt that confessing to having used alcohol would have diminished intentionality and seriousness of their action, depriving it of the meaning they hoped to express through it (James, 1972).

The rate of alcohol involvement in the suicide event appears relatively lower than that for many of the other casualties, but sufficiently high to warrant further study, particularly studies of the scenarios of suicide events which would suggest the ways in which alcohol is involved. The link between drinking and suicide has been provided by the various psychotropic

Table S-1

Empirical Studies--Completed Suicides
(alcohol use during event)

Author, date, location	Suicides N	% Alcohol present	Alcohol measure	% BAC taken
<u>United States</u>				
Spain, 1951 Monroe Co., New York	70	19	BAC .01+	100
Wilents, 1953 New York and New Jersey	335	27	unspecified	--
Shneidman and Farberow, 1961 Los Angeles	768	18	9% BAC .01-.15 9% BAC .15+	78
Attkisson, 1970 San Francisco	122	27	BAC .03-.05	--
Deasy, 1971 Wayne Co., Michigan	290	40	BAC .01+	100
Babermann, 1974 New York	105	26	BAC .01+	59
	35	29	BAC .01+	100
	subsample of those who killed them- selves with drugs			
<u>Foreign</u>				
Hansen, 1956 Germany	344	32	BAC .01+	69
Bowden, 1958 Australia	39	3	BAC .01+	100
James, I.P., 1966 Western Australia	193	20	10% BAC .01-.15 10% BAC .15+	55
Edwards and Whitlock, 1968 Brisbane, Australia	680	26	"taken liquor"	--
Cutler, 1971 British Columbia	93	36	BAC .01+ witness reports	47
Ovenstone and Kreitman, 1974 Edinburgh, Scotland	106	45	"taken liquor"	--
Alha, 1974 Helsinki, Finland	112	37	BAC .01+	--

Table S-2

Empirical Studies--Attempted Suicides
(alcohol use during event)

Author, date, location	Attempters N	% Alcohol present	Alcohol measure	% BAC taken
<u>United States</u>				
Ripley, 1973 Seattle	121	43	Drinking at time	--
<u>Foreign</u>				
Bachelor, 1954 Edinburgh, Scotland	200	20	BAC .01+	100
Ringel and Rotter, 1957 Vienna	506	15	Intoxicated at time	--
Whitlock and Schapiro, 1967 Newcastle, England	274	46	31% taken liquor 15% intoxicated	-- --
Harenko, 1967 Helsinki, Finland	550	30	Intoxicated at time	--
Cay et al., 1970 Melbourne, Australia	12	42	BAC .01+	100
James, I.P., 1972 Western Australia	50	62	34% BAC .05-.15 28% BAC .15+	100 100
Ripley, 1973 Edinburgh, Scotland	100	25	Drinking at time	--
Honkainen and Viauri, 1976 Helsinki, Finland	22	64	BAC .01+ 18% .06-.15 37% .16+	100

powers that researchers often attribute to alcohol.

Much attention has been paid to the psychological effects of alcohol and its ability to alter mood and judgment as ways to explain the noted association. One study concluded that alcohol was an important factor which often leads to a lowering of self control, with possibly an aggravation of a temporary mood of depression (Whitlock and Schapira, 1967). Other studies of suicide attempters have led clinicians to focus on the presence of depression under intoxication as the important link in the process. There is experimental evidence that alcohol has the dual propensity to both relieve and increase depression in subjects under differing conditions and in differing doses (Russel and Mehrabian, 1974).

Alcohol is often the drug of first choice for those who wish to alleviate the effects of depression. Experimental research has shown that the initial response to alcohol is an increase in excitement and arousal, followed by drowsiness and less activity in higher doses. While the subjective effect of alcohol can be strongly modified by pre-existing mood and the social setting of drinking, experiments have shown that moderate doses of alcohol have depression-relieving effects in depressed and alcoholic subjects, while greater quantities of alcohol increased both anxiety and depression (Russel and Mehrabian, 1975). It has been suggested by one researcher that intoxication may increase the likelihood of suicidal thoughts in an individual who is already suicide prone and can facilitate the transition from thought to action (Benensohn, 1974).

Other studies of suicide attempters have indicated that the important causal link between drinking and a suicidal attempt lies not so much in depression causing properties of the alcohol as in its supposed disinhibiting

characteristics.

The notion that alcohol can provide "dutch courage" to follow through on an intended course of action also is proposed in the literature (Ringel and Rotter, 1957). Survivors often do admit to having used alcohol before their suicide attempt in order to go through with it. There is also evidence that alcohol can precipitate a suicide attempt by diminishing the ego controls in certain personalities. One of the safeguards to life is that the self-preserving tendencies in a suicidal person alert him to the dangers of his self-destructive intentions. In this constant struggle of life-ending and life-preserving impulses, alcohol increases the possibility of death by decreasing the critical, realistic life-evaluating actions of the ego (Tabachnick et al., 1973).

A study of suicide attempters by Mayfield and Montgomery (1972) distinguished two differing effects of alcohol among those attempters who had been intoxicated at the time. Their group was divided between those who had an "abreactive" reaction from the alcohol and those who had a depressive reaction. The abreactive group had become abruptly intoxicated and made their attempts in the context of an interpersonal interaction accompanied by anger, aggression, and hyperactivity. In many ways, these impulsive outbursts seem analogous to the outpouring of sudden hostility towards others when intoxicated so prevalent in the crime literature; in this case, the perpetrator serves as his own victim.

The depressives' suicide attempts also occurred while intoxicated, but typically after a period of prolonged drinking, accompanied by increasing depression, hypoactivity, and social withdrawal. The subjects in this group made their attempts quietly while alone, with apparent ease and

deliberation, and sustained the most serious injuries. Thus, the depressive syndrome chronic intoxication type of suicide attempt is highly lethal compared with the abreactive type and may be the basis of a number of successful suicides.

Along with these studies on the psychological effects of alcohol and its relation to suicide, researchers have also looked at the physiological effects of alcohol as a way of explaining the association between alcoholism, alcohol use, and suicidal acts. Early researchers dismissed this power of alcohol and actually considered alcohol use to be associated with less serious suicide attempts because it would interfere with the motor ability needed to carry out a suicide successfully. As one writer put it in a 40 year old study, the use of alcohol in many cases "appeared to derange, inhibit, or render generally less efficient the technique and planning used to carry out suicide attempts" (Moore, 1939a, p. 693).

Whether this was ever true or merely a reflection of the association of intoxication with impulsive suicide attempts which are unplanned and often poorly executed, is a moot point now. At present the most common method of attempting suicide is self-poisoning with drugs. The availability of easily obtained and painless means for committing suicide is an important social fact of our times and is considered to be a major problem by suicidologists. It is common knowledge that alcohol combined with some sorts of drugs, has a far greater lethal possibility than an overdose of drugs alone. Many suicide attempters admit to taking alcohol with drugs to increase their effect (Whitlock and Schapira, 1963).

The ironic truth is that most people do not have any idea of the amounts of substances needed to produce death; impulsive suicide attempters ingest

large quantities of dangerous drugs such as barbituates or relatively benign substances such as contraceptive pills and aspirin. People who are intent on suicide often misjudge the amounts of even dangerous drugs that can prove lethal; unfortunately, some people with less serious intent do not realize the great potentiating power of alcohol combined with most drugs (Sterling-Smith, 1974). Drinking during a suicide attempt can have a most deleterious influence on the outcome regardless of the means used.

A surprising finding relating alcohol consumption with the outcomes of suicide attempts came out in a study of attempted suicides in Philadelphia. It is a good example of what can be learned about suicidal behavior through psychological testing of suicide attempters. Using a scale that measures the degree of intent demonstrated by the attempter, the researchers found that there was a negative correlation between level of intent and physical damage in those who had been drinking during the attempt. That is, drinkers had been less depressed, had less wish to die, and used less planning in their attempts than the non-drinkers who had suffered the same degree of injury in their attempts. Under the influence of alcohol, the actions of suicide attempters are likely to be more damaging than if they were sober (Beck, et al., 1976).

This is in agreement with studies of traffic accident victims that suggest the presence of alcohol in the body can make injury more serious and will more likely result in a fatal outcome with a given level of physical trauma. This finding would tend to offer alternate explanations to those who explain the high association between alcoholism and suicidal behavior as being due to the alcoholic's greater degree of depression, social isolation, unhappiness, poverty, etc. It may simply be that the alcoholic's

propensity to attempt suicide when intoxicated injures far more than would otherwise be the case, resulting in being seen in a clinic and thus registered as an attempted suicide, or in the morgue where they are duly noted as an alcoholic suicide.

b. Drinking History of Suicides

The long term effects of problem drinking and alcoholism often have been considered to be important precipitants of suicide. Many researchers have reported the proportion of alcoholics in samples of completed and attempted suicides (Tables S-3 and S-4). These estimates range from a low of .5% (Bridges and Koller, 1966) to a high of 48% (Heller, 1900). Except for two studies (Bridges and Koller, 1966; Ipsen et al., 1952), most of these studies show a substantial percentage of alcoholics among the groups of suicide victims sampled, most above 10% of the sample, many 20% or more. Because estimates of the prevalence of alcoholism in the general adult population have traditionally been considered lower, these studies have been regarded as suggesting that alcoholism is several times more common in samples of suicides than in the general population.

But studies of the prevalence of alcoholism in samples of suicides and suicide attempters are hampered in at least three important ways that affect the dependability of the alcoholism-suicide association. It is well known that both the rates of suicide and of problem drinking are strongly influenced by demographic variables, so that to discover that a certain percent of suicides are alcoholic tells us little without knowing the rate of alcoholism in a demographically comparable sample of the general population. Since most studies reporting alcoholism among suicides are conducted in samples of suicide attempters or completed suicides, data on the alcoholism

Table S-3
 Empirical Studies--Completed Suicides
 (% labelled alcoholic)

Author, date, location	Suicides N	% Alcoholic	Alcohol measure	Years of collection
<u>United States</u>				
Schmid , 1933, Minneapolis, Minn.	375	10	Mentioned in coroner's records	1928-1932
Ipsen et al., 1952 Massachusetts	111	2	Persons with physical signs of alcohol-abuse seen during autopsy	1938-1948
Tuckman and Lavell, 1958 Philadelphia	742	10	History of alcoholism	1951-1955
Robins et al., 1959 St. Louis	134	23	Chronic alcoholism diagnosis using Keller criteria made after the suicide	1956-1957
Yessler et al., 1961 U.S. Military	272	10	History of chronic alcoholism	1952-1954 1956-1957
Palola et al., 1962 Seattle	105	31	Diagnosed as alcoholic using Jackson scale of alcohol preoccupation	1957-1958
Attkisson, 1970 San Francisco	122	10	History of alcoholism	1958-1967
Haberman and Badan, 1974 New York	105	9	Determined by coroner	1972
<u>Foreign</u>				
Casper, 1825 Prussia	218	28	Attributed to alcohol or debauchery	1820s
Heller, 1900 Kiel, Germany	300	48	Chronic alcoholics	--
Sainsbury, 1955 London	390	6	Noted on coroner's records	1936-1938
Stengel and Cook, 1958 London	117	12	Noted on coroner's records	1953
Gorceix and Zimbacca, 1965 Paris	148	24	15% diagnosed chronic alcoholics; 9% heavy drinkers	1962
Krupinski, 1965 Victoria, Australia	449	6	Persons who had records of treatment in mental hospital for alcoholism	1963
James, 1966 Western Australia	193	17	9% had history of treatment for alcoholism; 8% were considered heavy drinkers by informants	1961-1962
Achté and Lönnquist, 1971 Helsinki, Finland	504	8	Persons who had previous histories of treatment in mental hospitals for alcohol psychosis or alcoholism	1956-1965
Ovenstone and Kreitman, 1973 Edinburgh, Scotland	106	27	Noted on coroner's records	1969-1971
Patel, 1974 London	764	13	Heavy users of alcohol	1967-1969
Barraclough et al., 1974 West Sussex, England	100	15	Alcoholics; diagnosis made by psychiatrist based on informants' interview	1966-1968

Table S-4
 Empirical Studies Table--Attempted Suicides
 (% labelled alcoholics)

Author, date, location	Attempters N	% Alcoholic	Alcohol measure	Years of collection
<u>United States</u>				
Moore, 1939 Boston	143	11	History of drinking; under alcohol influence at time of suicide attempt	1915-1939
Wallinga, 1949 St. Paul, Minnesota	381	16	Chronic alcoholics; previous treatment for acute alcoholism	1937-1946
Arief et al., 1948 Chicago	258	22	Alcoholic=those with psychiatric diagnosis of chronic acute alcoholism	1937-1946
Schmidt et al., 1954 St. Louis	109	13	Chronic alcoholism sufficient to cause loss of job, family, or legal trouble	1952-1953
Palola et al., 1962 Seattle, Washington	118	23	Classified by Jackson scale of preoccupation with alcohol	1957-1958
Beck, 1976 Philadelphia	378	33	23% diagnosed episodic excessive drinkers; 7% habitual excessive drinkers; 3% as alcoholics	1972-1976
<u>Foreign</u>				
Batchelor, 1954 Edinburgh, Scotland	200	22	Drinking history	1950-1952
Uttlinger and Flordh, 1955 Stockholm, Sweden	500	18	Diagnosed as alcoholic by psychiatrist after attempt	1952-1953
Epp, 1957 England	100	24	Chronic alcoholics; sample of women only	1957
Ringle and Rotter, 1957 Vienna	506	8	Diagnosed after attempt	1957
Stengel and Cook, 1958 London	174	20	Diagnosed alcoholic addicts	1964
Rueggsegger, 1963 Basel, Switzerland	132	15	Diagnosed chronic alcoholics after attempt	1954-1959
Bridges and Koller, 1966 London	198	0.5	Primary diagnosis by psychiatrist after attempt	1966
Ahtela and Cinmen, 1966 Helsinki, Finland	100	13	Chronic alcoholism diagnosed after attempt	1963
Kessel, 1965 Edinburgh, Scotland	501	9	Drinkers "unquestionably addicted with physical signs present"	1962-1963
Krupinski et al., 1965 Victoria, Australia	358	8	Diagnosis of alcoholism by psychiatrist after attempt	1963
Harenko, 1967 Helsinki, Finland	550	15	Diagnosis after attempt	1962-1964
Bratfos, 1971 Norway	316	27	Alcoholic: large consumption of intoxicant	1954-1966
Ripley, 1973 Edinburgh, Scotland	100	28	Includes alcoholics and heavy drinkers using Jellinek's criteria	1970
Morgan et al., 1975 Bristol, England	337	10	Alcohol addicts	1972

rates for comparable general population groups ordinarily are not available and not presented.

Second, the criteria used to identify problem drinkers vary from study to study. Some researchers asked surviving relations if the victim had a drinking problem (Barracough, et al., 1974), others made a psychiatric diagnosis based on the deceased's medical history (Gorceix and Zimbacca, 1965). Some obtained current drinking quantity/frequency data from survivors of suicide attempts (Beck et al., 1976) while yet others labelled as alcoholics only persons who had a history of alcoholism treatment before their suicidal acts (Tuckman and Lavell, 1958; Yessler, 1961; Attkisson, 1970; Krupinski et al., 1967; James, 1966; Achte and Lonquist, 1971 -- it is significant that in these six diverse studies that identified alcoholism by a previous history of alcoholism treatment, the findings were all very similar, ranging from 6%-10%). Some of the variations found in the proportions of alcoholics across studies of suicides are due to important variations in the definitions and diagnostic criteria used to diagnose the condition.

As Clark (1966) pointed out, estimates of the prevalence of alcoholism in the general population can be varied from very low to very high depending on the sorts of criteria and cutting-points that are employed. In combination, the selection of a restrictive definition of alcoholism in the suicide sample and the use of a wide-ranging definition of alcoholism in the general population sample might easily be made to create the impression that alcoholism is less frequent among suicides than among members of the general population. To take extreme examples: Ipsen et al.'s (1952) estimate of 1.9% alcoholics

among Massachusetts suicides from 1938-1948 employed a very restrictive definition; compared to Efron et al.'s 5% estimate of the prevalence of alcoholism in the U.S., the Ipsen et al. findings would suggest that alcoholism is only about 40% as common among suicides as among the general population. On the other hand, Cahalan and Room's (1974) report that 36% of U.S. men in the general population have at least one, current, relatively serious drinking-related problem would, if compared to the Ipsen et al. figure, suggest that suicides, as a whole, have very few drinking problems.

The third problem associated with studies of the prevalence of alcoholism in samples of suicides and suicide attempters concerns the biases inherent in gathering information after and because of suicide attempts. A suicidal act, whether successful or unsuccessful, quite naturally presents the investigators with a puzzle that wants an answer. Thus, signs and symptoms that might be missed, ignored, or passed over in some other context of investigation might be fixed upon and even magnified in this context. This sort of potential bias runs through many sorts of clinical investigations. For example, the diagnosis of mental illnesses has been criticized by showing that most members of ostensibly normal groups can recall personal experiences that would suggest a psychiatric disorder (Movahedi, 1975). Retrospective reconstructions of one's life history are strongly influenced by deviant labels (Schur, 1970).

Goffman (1961) has argued that the collection of case histories in diagnostic sessions is biased toward gathering evidence of disorder rather than a balanced picture of the subject's life experience. In the full span of a subject's life history, for example, only a minority of Cahalan and Room's (1974) male drinking respondents could report never experiencing a drinking-related problem of one sort or another.

Some studies of suicides have indicated that those suicide victims labelled as being "alcoholics" differed from the rest of the sample in ways other than drinking. In a number of studies, a larger proportion of male than of female suicides were considered alcoholics, though this may in part be due to male victims more readily than females being labelled as alcoholic. Some studies have also suggested that alcoholic suicides occur at younger ages than suicides in general, with the largest proportion occurring in the middle years. Male suicides between the ages of 40-50 have been found to have a larger proportion of alcoholics than suicides in other age groups (Attkisson, 1970 and Virkkunen, 1972). Farberow and Simon (1968), Patel (1974), and Ovenstone and Kueitman (1974) all delineated a typology of "down and out middle-aged male alcoholics" in their samples of suicides, with very little alcohol involvement found in suicides either by younger or older men. Yet Palola et al. (1962) found that in their sample of suicides, the median ages of the alcoholics and non-alcoholics were almost the same, indicating that the perceived age difference may be partially due to sample selection. Other than the age and sex differences already noted, there do not seem to be any other consistent differences noted among the alcoholic and non-alcoholic completers in various studies. The suicidal behavior of the identified alcoholics closely resembles that of non-alcoholics in regard to method, communication of intent, presence of a suicide note, or predisposing events.

Two findings have been noted in many studies that may be important in understanding how alcoholism relates to suicide. Studies have shown that alcoholics (i.e., those labelled "alcoholics" by suicide investigators) were more likely to have been drinking immediately before committing suicide than

Table S-5

Drinking During Suicidal Act -- Alcoholics and Non-Alcoholics

<u>Author Year</u>	<u>Sample N</u>	<u>Drinking at Time</u>	
		<u>Alcoholics</u>	<u>Non-Alcoholics</u>
Palola et al. 1962	83 completed suicides	78% (18/23)	8% (5/60)
James 1966	107 completed suicides whose BACs were taken	84% (21/25)	27% (23/86)
Virkkunen 1971	150 completed suicides	42% (21/50)	13% (13/100)
Bachelor 1954	200 attempted suicides	54% (23/43)	10% (16/157)
Palola et al., 1962	119 attempted suicides	89% (24/27)	38% (35/92)
Achte & Ginmen 1966	100 attempted suicides	100% (13/13)	N/A
Ripley 1973	104 attempted suicides	66% (19/29)	9% (7/75)

non-alcoholics. In the case of suicide, and possibly unlike other indicators of alcohol problems, high intoxication rates are clearly associated with alcoholism and problem drinking (Lahelma, 1977, p. 9). Table S-5 shows how strong this relationship is. In several studies of attempted suicide and completed suicide, 42-100% of the alcoholics involved had been drinking, while only 8-38% of non-alcoholics had been drinking at the time of their suicidal acts. This finding suggests that the association noted between alcoholism and suicide may, in fact, be an association between alcohol intoxication and suicide, and that intoxication per se may be a crucial factor leading to suicide attempts in certain personality types or in causing injuries serious enough to bring the alcoholic attempters to the attention of the authorities.

Another finding noted in many studies is that alcoholics who commit suicide have had a history of more suicide attempts than the non-alcoholics. This is an especially interesting observation, for in most other respects the attempter population does not resemble the completer population. It appears in comparing studies of attempted suicides and completed suicides that the groups labelled as alcoholics in both groups have similar demographic characteristics, which may be in indication that alcoholics who attempt suicide could form a significant part of the population that will go on to later completed suicides.

As in samples of completed suicides, more men than women are labelled as being alcoholic.

Table S-6

Sex differences among labelled alcoholic suicide attempters

		M	F
1. Batchelor	Attempters	N=92	N=108
	Alcoholics	N=30(33%)	N=13(12%)
2. Harenko	Attempters	N=185	N=365
	Alcoholics	N=69(37%)	N=12(3%)
3. Krupenski	Attempters	N=204	N=154
	Alcoholics	N=27(13%)	N=4(3%)
4. Wallinga	Attempters	N=155	N=226
	Alcoholics	N=38(25%)	N=22(10%)

The difference in percentages is especially striking, as most studies of attempted suicides have far more women than men in the sample. In the four studies in Table S-6 the percentages of men attempters who were labelled alcoholic ranged from 25-37%, while only 3-12% of the women were so labelled. Other studies have indicated that alcoholics tend to be older than the majority of the attempted suicide populations, though usually younger than alcoholics seen in completed suicide samples (Palola et al., 1962). Some studies have indicated that alcoholics' attempts were no more lethal than the rest of the sample (Schmidt et al., 1954, Palola et al., 1962).

Few studies of suicide have been formulated with sufficient rigor and foresight that adequate control groups in the general population could be identified or compared with them. One such research study is being undertaken by Dr. Aaron Beck in Philadelphia, based on samples of attempted suicides seen in a general hospital. Because of the comparatively large amount of drinking data collected on each patient, and comparability with other social surveys, it is possible to see how his suicide population's drinking habits differs from that of a "normal" urban population.

The Beck study is based on interviews with 416 suicide attempters.* Two kinds of alcohol-related data were collected: first, patients were diagnosed for alcoholism (either as "episodic excessive drinkers," "habitual excessive drinkers," or "alcohol addicts") in accordance with the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (1958). Second, a brief questionnaire concerning problems associated with alcohol use was administered; the data gathered in this way was similar to that obtained in a recently conducted survey of drinking practices and problems in the adult population of San Francisco undertaken by Cahalan and Treiman (1976), whose data on 1138 adults aged 18-59 can be used as a comparison group to see the differences in alcohol use patterns in suicide attempter and general populations.

The APA's definition of alcoholism is broadly inclusive, allowing for drinkers with alcohol-related impairments to health or social functioning, or with signs of dependence on alcohol. This sort of definition is likely to include a sizeable fraction of the general population. Table S-7 indicates the percentage of the suicide attempter population whose drinking patterns could be labelled as excessive or addictive.

The Cahalan-Treiman sample employed somewhat different criteria in classifying drinking habits, basing their assessments both on the consequences of drinking and on quantity/frequency measures. They found that 23% of the sample showed patterns of problem drinking, an additional 19% occasionally drank heavily or went on binges, and that 30% of the sample admitted drinking "enough to get high or tight" at least as often as once a month.

* The data for this analysis was provided by Dr. Aaron Beck and Dr. Marika Kovacs from their ongoing study of suicide attempters. The design for the project and some earlier findings from that data can be found in Lester and Beck (1975) and Beck et al. (1976).

Table S-7

Alcoholism and Alcohol-Related Problems in a Sample of Suicide Attempters

Alcoholism and Alcohol- Related Problems (% Alcoholic)	Total Suicide Attempters (N=384)**	White Only Suicide Attempters (N=202)
	<u>%</u>	<u>%</u>
Episodic excessive drinkers	22.4	17.8
Habitual excessive drinkers	7.6	8.9
Addicted to alcohol	2.9	3.0
Total "Alcoholic"	32.9	29.7

This comparison would seem to indicate two important points regarding the prevalence of alcoholism in sample populations. First, once again it is clear that the definition of alcoholism is most important for determining what percentage of a population will be so labelled and that this definition must be clearly given if any meaningful comparisons are to be made. The commonly reported figure of 5% prevalence of alcoholism in a general population does not hold when the definition of alcoholism is broadened. In the Cahalan study, from 30-42% of the sample might meet the definition of alcoholism employed in the diagnosis of suicide attempters. Secondly, when similar alcoholism definitions are applied to the two groups, it appears the percentage of excessive drinkers in the suicide attempter sample is not necessarily larger than in a normal urban population. It is only when specific indicators of alcohol problems applied to both samples are examined can we see whether the suicide attempter population differs significantly from the general population.

** The total Beck sample (N=416) was reduced by cases with missing data.

The second type of alcohol data collected in the Beck study was based on answers to a questionnaire on alcohol problems given to the subjects while they were in the hospital. Table S-8 shows the reported rates of various alcohol-related problems in the suicide-attempter sample. These rates are presented here as ranges (so, for example, the item concerning whether the respondent has been fired or threatened with firing from his job shows the positive responses to be 3.6 to 4.9 percent in the sample as a whole). The attempters were offered four different responses to each drinking-problem item: yes, definitely; yes, to some extent; yes, a little; and no, not at all. In the ranges presented in Table S-8 the first figure is the rate of yes-definitely, the second of all three kinds of yeses combined. The time frame for all of these drinking problem items was "the past year" (see Table S-8).

In the suicide sample as a whole, positive reports on nine drinking-problem items varied from a low of about 3% (quit or changed jobs... definitely) to a high of 18% (respondent regards self as 'problem drinker' ...any yeses). But, as mentioned, these frequencies tell us little without appropriate comparison to a general population sample.

With respect to demographics, the Beck et al. sample deviates in several important ways from the San Francisco general population sample: the Beck et al. sample is younger (74% younger than 35, 38% between 18 and 24); a greater proportion are female (61%); a greater proportion black (47%); and fewer were married (only 23% married or cohabiting in the suicide sample). The overrepresentation of young people is likely to send up the reported rates of drinking problems (in general population surveys, respondents 20-24 report the highest rates of problems associated with alcohol); on the other hand, the overrepresentation of females

Table S-8

Current Prevalences of Drinking Problems in a Sample
of Suicides Attempters

<u>Drinking Problems</u>	Suicide Attempters	
	Total (N=384)	White Only (N=202)
	%	%
Has an employer fired you or threatened to fire you if you did not cut down or quit drinking?	3.6-4.9	5.6-6.4
Has your spouse left you or threatened to leave you if you did not do something about your drinking?	4.4-7.0	4.5-7.5
Have you been picked up or arrested by police for intoxication, fighting, disturbing the peace, or other charges related to drinking?	7.6-9.6	10.9-12.4
Has a doctor told you that your drinking was injuring your health?	7.0-8.1	7.9-8.9
Have you quit a job or changed jobs because you were in trouble or likely to get into difficulty due to drinking?	2.9-4.2	5.4-6.4
Have you had any accidents or injuries that could have been due to <u>your</u> drinking?	6.3-8.6	9.9-11.4
Have you failed to do some things you should do--like keeping appointments, keeping your house up, attending to your work, etc.--because of drinking?	7.3-9.4	10.4-13.4
Do you consider yourself a "problem drinker"?	9.1-18.2	9.9-19.3
Do you consider yourself an "alcoholic"?	4.9-8.1	7.4-11.9

in the attempter sample is likely to send the reported problem rates down (females report fewer drinking problems than males). Thus, the demographic makeup of the suicide sample suggests the need for a comparison in which the general population sample is standardized to reflect the attempter sample.

Unfortunately, the number of blacks in the general population sample was insufficient for such standardization (several marital-status/age/sex cells of the standardization table were, in fact, empty in the black general-population group), and therefore we are forced to limit the comparison in problem rates to whites only.

Table S-9 shows the rates of various drinking problems among white attempters (column one). The second column of Table S-9 reports the unstandardized prevalence of the same problem in the general population as a whole--this column, then, is the overall problem rate before it is adjusted for the age/sex/marital status composition of the attempter sample. The third column shows the problem rates in the standardized general population sample (whites only). And, finally, the fourth column of Table S-8 reports the "lifetime" or "ever" prevalence of each drinking problem. This fourth column, then, reflects the potential prevalence of a drinking problem at any time (not just the last year) in the respondent's life, and thus gives us a rough guess of the associated prevalence rates for drinking problems if the general population respondents, like the attempter respondents, had been "caught at their worst" by the study.

Thus, in short, Table S-9 controls for each of the three difficulties commonly associated with suicide samples: the comparisons involve nearly comparable items, thus reducing the sway of differing definitions and images of "alcoholism and problem drinking." The general population problem rates

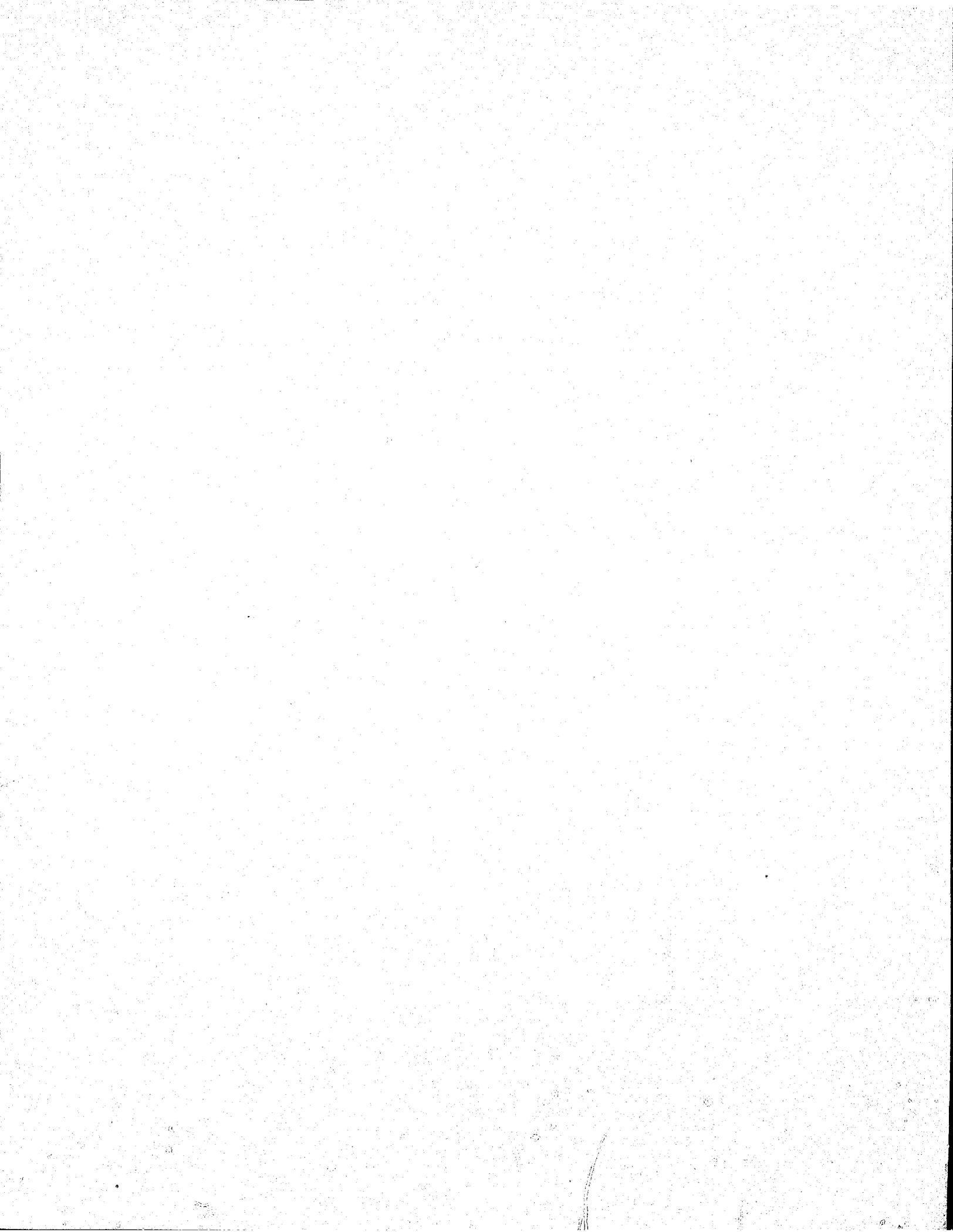


Table S-9

Alcohol-Related Problems Among Suicide Attempters, in the San Francisco General Population, and in the San Francisco Sample Standardized by Age, Sex, and Marital Status (Current and Lifetime Prevalences; Whites Only)

	Beck et al. Sample	San Francisco General Population Sample		
	Suicide Attempters	"Current" Drinking Problems		"Lifetime" Problems
	(N=202)	Unstandardized	Standardized	Standardized
<u>Drinking problems</u> *	(%)	(%)	(%)	(%)
1. Picked up by police ¹	10.9-12.4	0.5	0.6	5.4
2. Doctor said cut down ²	7.9- 8.6	2.3	2.5	5.4
3. Accidents or injuries ³	9.9-11.4	2.4	3.6	15.8
4. Failed to do things ⁴	10.4-13.4	1.9	2.8	7.9
5. Lost a job ⁵	6.4- 7.9	0.6	0.8	1.6
6. Spouse left or threatened ⁶	4.5- 7.5	1.1	0.8	1.3
7. Problem drinker or alcoholic ⁷	11.9-20.8	2.1	2.3	3.4

*See Table S-8 for the complete drinking-problem questions asked in the suicide-attempter sample.

¹The comparable San Francisco survey item read: [just following an item concerning drug driving arrests] Have you ever gotten into any other kind of trouble with the law because of anything connected with your drinking (aside from drunk driving arrests)? Positive response: Yes, during the last 12 months (for columns 2 and 3); Yes, ever (for column 4).

²San Francisco item: Did a doctor ever tell you that drinking was having a bad effect on your health? Positive response: Yes, during the last 12 months (for columns 2 and 3); Yes, ever (for column 4).

³San Francisco item: Did drinking ever cause you to have an accident or injury of some kind either at work, at home, or on the street or someplace else? Positive responses: Yes, during the last 12 months (for columns 2 and 3); Yes, ever (for column 4).

⁴San Francisco item: Sometimes I get drunk even when there's an important reason to stay sober. Positive response: True Now (for columns 2 and 3); True Ever (for column 4).

⁵In order to improve the comparability between the Beck et al. and the Cahalan and Treiman data, two Beck items concerning job loss were combined: thus, saying yes either to "Has an employer fired you or threatened to fire you if you did not cut down or quit drinking?" or to "Have you quit a job or changed jobs because you were in trouble or likely to get into difficulty due to drinking?" qualified the respondent for a positive response. The comparable San Francisco item read: Have you ever lost a job because of drinking? (Positive response: Yes, in 1974 or 1975 (for columns 2 and 3); Yes, Ever (for column 4).

⁶Here, two San Francisco items were combined in order to improve the comparability between the two data sets. These were: Have you ever been separated or divorced because of your drinking? Positive Response: Yes, in 1974 or 1975 (for columns 2 and 3); Yes, Ever (for column 4), or Which people, if any, threatened to end their relationship with you because of your drinking, in the past 12 months? (Positive response: my spouse . . .)

⁷Two Beck items concerning self-characterization of one's drinking status were combined; saying "yes" either to "Do you consider yourself a 'problem drinker'?" or "Do you consider yourself an 'alcoholic'?" qualified the respondent for a positive response. The San Francisco item read: "Which one of the following terms would best describe your drinking at the present time?" (Positive Response: "A Problem drinker or alcoholic" (columns 2 and 3); "A problem drinker or alcoholic" or "An ex-problem drinker or ex-alcoholic" (column 4)).

have been standardized by age, sex, and marital status, thus reducing the likelihood that similarities or differences in the suicide/general population rates are due to demographic differences between the two samples. Finally, the last column in Table S-9 (the one reporting "lifetime" prevalence rates) gives us a rough control for the biases that may spring from interviewing suicide attempters at relatively bad spots in their lives.

Several observations are suggested by Table S-9. First of all, it is strikingly clear that the one-year prevalences of various drinking problems are substantially higher in the attempter group than that in the general population sample. In most cases, the standardization of the general population group proved to make little difference in the associated prevalence rate--which suggests that the offsetting tendencies toward higher prevalences (youth) and lower prevalences (femaleness) balanced each other nearly equally. There are, moreover, some dramatic differences between the attempter and general-population samples in the individual problem rates.

In order of descending relative risk, suicide attempters were most unlike their general population counterparts in their risk of being picked up or arrested by the police for something associated with their drinking (the ratio is roughly 20:1, attempters versus general population). At least part of this heightened risk, though, may be due to the manner in which the suicide attempter was delivered to the hospital; that is, attempters may be counting the suicide attempt itself as a contact with the police involving drinking. The next highest risk factor is that associated with the loss of a job--attempters were roughly nine times more likely than nonattempters to have lost a job in the past year. The likelihood of losing a spouse or labeling oneself as a problem drinker or alcoholic also were substantially

greater in the attempter group (for losing a spouse, 7.5; for self-labelling, 7.1). The relative risk of (1) being told by a doctor that drinking was harmful to one's health, (2) accidents or injuries associated with drinking, and (3) "failing to keep obligations" ran from roughly 3:1 to 4:1 in these samples--high, but rather lower than the risks associated with police, job, spouse, and self-labelled drinking problems.

These risk-ratios, however, are cut substantially if we broaden the time limit on the general population sample so that drinking problems ever experienced by the respondent are included in the prevalence rates. In this case, police, doctor, accident, and "failed obligations" problems are reduced to relative risks of 2:1 or less. Indeed, with respect to accidents or injuries, the general population rates become higher than the attempter rate. In this expanded time frame though, job, spouse, and self-labelled problems related to drinking persist in showing substantially greater prevalence ratios in the attempter group (job, 4.5:1; spouse, 4.5:1; self-label, 5:1). As mentioned earlier, this expansion of the time frame serves to minimize the bias of catching attempters at relative bad points in their lives. It seems, however, that job, spouse, and self-labelled drinking problems remain uncommonly prevalent among suicide attempters even when this bias is reduced.

c. Incidence of Suicide Among Labelled Alcoholics

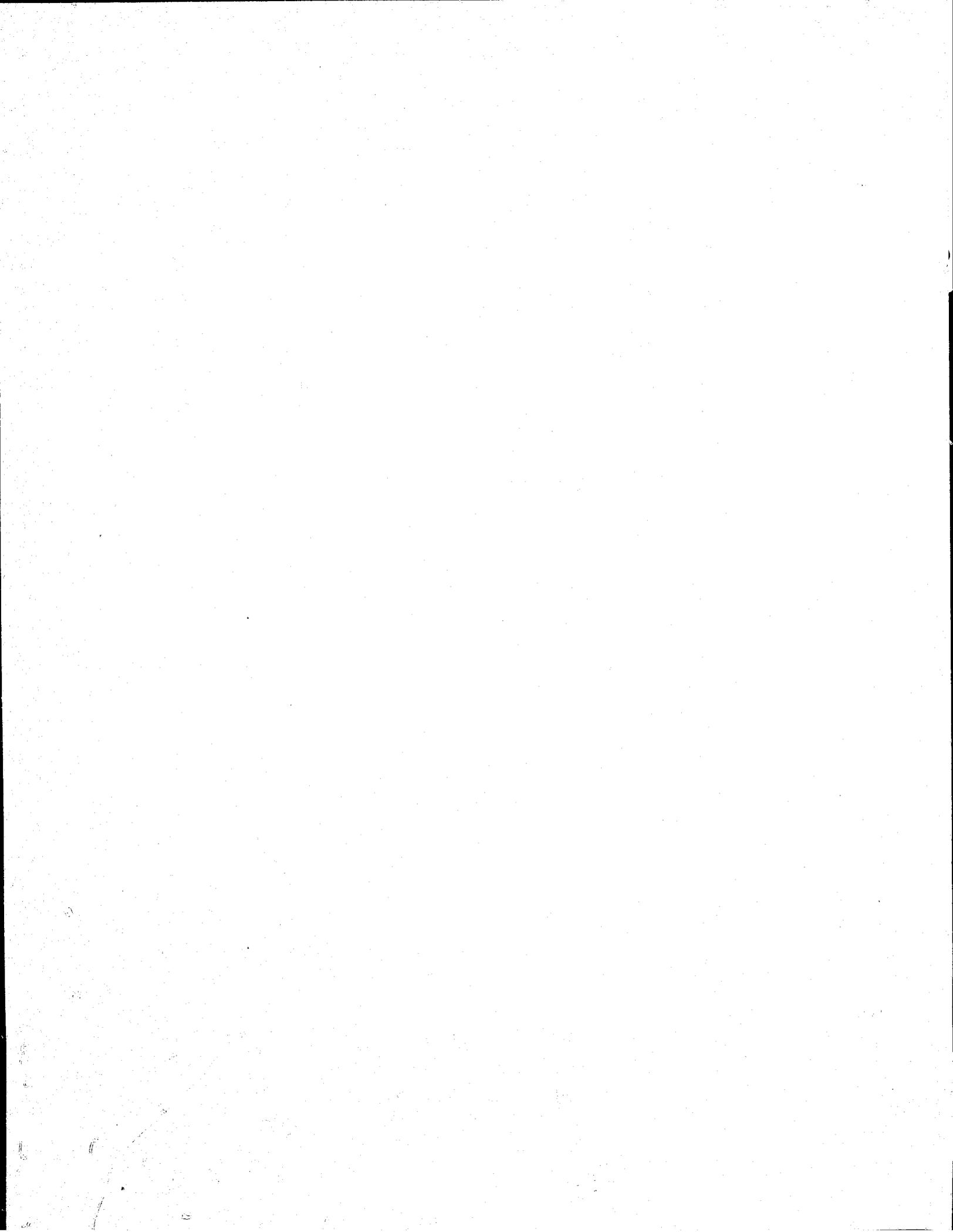
The indications that alcoholics form a significant portion of suicidal populations are not contraindicated in studies made on alcoholic populations. Studies of labelled alcoholics show interesting variations in the ranges of involvement presented. In several studies that asked alcoholics about suicide attempts prior to being seen in a clinic for treatment of their alcohol problem (or in some cases AA members before they stopped drinking) between 12-25% admitted to having made a suicide attempt (Table S-1). This is a fairly narrow range of involvement considering the dissimilarities of time periods, countries, and, presumably, populations involved. These close ranges are in sharp contrast to the suicide mortality seen in follow-up studies of alcoholics in treatment. In this case, the observed percentages of alcoholics who killed themselves range from .1% to 8%, the latter rate being 80 times the former (Table S-10).*

These figures point out the difficulties in knowing what the relationships between alcohol abuse and suicide are. The wide range of variation in the completed suicide samples would indicate that different samples were being looked at, that different segments of a general population were being labelled as alcoholics, or at least alcoholics with varying propensities to commit suicide were being included. Of course, some of the variation may have been due to extraneous factors such as mislabelling the death of an alcoholic as natural or accidental when it was indeed a suicide, or having the suicide-prone individuals drop out of the follow-up group so that their

*All studies in Table S-10 were follow-up studies of alcoholics seen in treatment centers except Lemere (1953). The overall range for completed suicides among alcoholics is .1% to 11%, as seen in S-10.

Table S-10
 Empirical Studies--Alcoholics' Completed Suicides

Author, date, location	Alcoholics N	% Completed suicide	Alcohol measure	Years of collection	Follow-up period
<u>United States</u>					
Lemere, 1953 Seattle	500	11	informants' reports	--	--
Tashiro and Lipscomb, 1963 California	127	5	clinic population	1954-58	1-4 yrs
Davies, 1965 U.S.	2,582	0.1	clinic population	1940-62	1-22 yrs
Brenner, 1967 S.F. Bay Area, California	1,343	0.7	clinic population	1954-61	4-7 yrs
Pell and D'Alonzo, 1973 Wilmington, Delaware	899	0.4	clinic population	1965-69	1-5 yrs
Schuckit and Gunderson, 1974 San Diego, California	3,689	3	military clinic population	1965-71	6mo-6yrs
Choi, 1975 St. Louis, Missouri	863	0.2	clinic population	1969-72	1-3 yrs
<u>Foreign</u>					
Dahlgren, 1951 Malmo, Sweden	10,616	0.6	clinic population	1939-47	3mo-8yrs
Norvig and Neilson, 1956 Roskilde, Denmark	221	7	clinic population	1948-50	2½-5½yrs
Kessel and Grossman, 1961 London	131 87	8 7	Voluntarily treated Committed to hospital	1961 1961	1-11 yrs 4-5 yrs
Battegay, 1965 Basel, Switzerland	213	3	clinic population	1963	1½-2½ yrs
Kendall and Staton, 1966 London	62	8	clinic population	1950-61	2-13 yrs
Ritson, 1968 Edinburgh, Scotland	300	3	clinic population	--	9mos-2yrs
Ciampi and Eisert, 1969 Switzerland	1,468	7	clinic population	1963	1-60yrs
Schmidt and de Lint, 1972 Toronto, Canada	6,478	0.8	clinic population	1951-63	1 - 14 yrs
Dijk et al., 1973 The Netherlands	211	0.5	clinic population	1959-1962	2½ - 5½yrs
Nicholls et al., 1974 England	935	5	clinic population	1953-67	10-13 yrs
de Lint and Levinson, 1975 Ontario, Canada	154	2	clinic population	1969-74	1 - 5 yrs
Medhus, 1975 Malmo, Sweden	83 (women)	5	clinic population	1961-1968	5-12 yrs



CONTINUED

6 OF 9

Table S-11

Empirical Studies--Alcoholics' Attempted Suicides

Author, date, location	Alcoholics N	% Attempted suicides	Alcohol measure	Years of collection	Follow-up period
<u>United States</u>					
Palola et al., 1962 Seattle	129	12 24	skid-row population AA population	1958	--
<u>Foreign</u>					
Glatt, 1954 London	103	23	clinic population	1954	--
Daumézon et al., 1955 Paris	1,130	12	clinic population	1953-54	--
Lerch, 1959 Basel, Switzerland	137	20	male clinic population	1959	--
Battegay, 1965 Basel, Switzerland	213	21	clinic population	1963	--
Koller and Castanos, 1968 Western Australia	234	20	clinic population	1967-68	--
Chandler et al., 1969 London	244	25	Members of AA	1969	--
Ohara, 1972 Japan	85	15	clinic population	1971	--

deaths are not reported at all. Variation in the frequency of suicide in follow-up studies of alcoholics is not explained by variation in the follow-up periods; in other words, in the studies reported in Table 3-11, both large and small percentages of suicides are found in studies with similar follow-up studies.

Unfortunately, the majority of these studies do not give enough demographic data on the total sample of the portion of the sample that evidenced suicidal behavior for comparisons to be made with studies of alcoholics found in suicidal populations. The literature does not suggest the suicidal alcoholic population is significantly different from the rest of the sample; indeed, Kessel and Grossman (1961, p. 1672) wrote, "We could find no feature that distinguished, during their stay in the hospital, the subjects who committed suicide from the other alcoholics".

The significant percentages of alcoholics who admitted to having attempted suicide is also an interesting finding. While the fairly close percentages involved in the various studies may be artifacts of the sample population (as much as the divergencies in the rates seen for completed suicides), it does suggest that previous suicide attempts are common in a clinical alcoholic population. This may well reflect the extremely depressed state many alcoholics reach before arriving at a treatment facility.

It has been argued that suicide attempts are often means of asking for help by a depressed person. Such behavior would explain the prevalence of suicide attempts in alcoholic populations, though it does not necessarily follow that alcoholics should also have a high rate of suicide, as many of the follow-up studies would seem to indicate. This suggests that suicide attempts in alcoholics may represent a more clearly self-destructive behavior that is a prelude to a future suicide, rather than merely being an un verbalized

cry for help. It has been claimed that alcoholics who attempt suicide are far more likely to succeed in committing suicide, and that the ratio of alcoholic attempters to alcoholic committers may be as low as 5:1, rather than the 10-15:1 usually claimed for the general population (Benensohn and Resnik, 1974, p. 40).

Studies of alcoholic populations have focused on the excess mortality among alcoholics from various causes, including suicide. This is commonly reported in terms of lifetime relative risk of alcoholics compared with a general population. These findings are also quite variable, ranging from the conclusion that the alcoholic population has no higher risk of suicide than the general population (Giffin, 1971), to the finding that there risk is 30 times as great (Medhus, 1975). Again, there is no way adequately to determine these risk figures. As in all these studies, the suicidal behavior of the alcoholic population depends on the sample used and the control group used to compare the alcoholic population. Since suicide rates vary by age, sex, and region, it is very important that the alcoholic population be matched with a similar sample of the general population. For example, many alcoholics would be white men aged 50 and more; the suicide rate for this group in the U.S. is around three times the overall suicide rate (36 per 100,000 compared with 12 per 100,000). Thus the alcoholic population must be compared with a similar sample to have a valid relative risk statistic.

Beyond the difficulties in determining the appropriate relative risk of suicide for an alcoholic population, remains the more important problem to

understand what the figures mean. Suicide is an extremely rare event, and even a large increase in the risk of its occurring in any group may indicate that only a very small number of that group will actually kill themselves. To appreciate how much additional risk alcoholics have for suicide, their behavior has to be compared with other groups at risk in the population. Suicidologists have tried to determine suicide rates for subgroups in the population as a way of predicting suicidal behavior and focusing prevention efforts on groups highest at risk in the community.

A study undertaken at one suicide prevention center indicated the variation of relative risk in subgroups of the population. It was determined that a history of chronic alcoholism carried with it a risk of suicide about ten times greater than the general population. This is considered to be a low suicidal risk compared with many other groups. For example, based on the occurrence of suicide among callers to the center, the investigators found that, as a group, callers to a suicide prevention center have a risk of suicide one hundred times greater than the general population; similarly, the risk factors of people who have made a suicide attempt serious enough to have required hospitalization are also one hundred times greater than the general population (Litman et al., 1974, p. 145). Surprisingly even these groups are considered only moderate risks for suicide and pose a problem for suicide prevention efforts. A group with 100 times greater risk of committing suicide would have a suicide rate of about 1000/100,000, that is 1% per year will kill themselves. This means, of course, that 99 out of 100 people at risk would not commit suicide in any one year. Therefore, it is very difficult to design any prevention program based on even such relatively high risk

criteria; what has to be done is to identify subgroups within the very high risk groups that contain those persons most likely to commit suicide.

The need for identifying the small groups with the highest risks of committing suicide is especially pertinent in populations of labelled alcoholics. It would seem that despite the higher risk of suicide in diagnosed alcoholics, this increased risk factor alone is not sufficient grounds for instituting suicide prevention treatment in an alcoholic population. Most alcoholics do not commit suicide, and alcoholism alone does not explain why people kill themselves.

The crucial problem is not the overall risk of the whole population of alcoholics, but rather the risk of the smaller number of suicidal alcoholics. This is the group that needs identification and treatment. Many alcoholics also have other high risk factors for suicide--history of attempts, physical illness, intense feelings of depression and hopelessness -- that can increase their suicide risk to a point many times that of normal, or even of alcoholic, populations. In the study cited above, a subsample of callers--"depressed alcoholic middle-aged men"--were identified as a group whose risk of suicide was 1000 times greater than the general population. Such a group might well be the focus of attention for future research (Litman, et al., 1974).

C. Conclusions

Much has been seen of alcoholics in suicide samples, of suicides in follow-up studies of alcoholic populations, and of alcohol use during suicidal acts. What can be said about these findings, what theories could explain the relations observed? People who attempt to commit suicide are grouped together due to that one action, but they can hardly be considered a homogeneous group. Alcoholism too is a complex behavior with many causes, manifestations

and actions. The intermingled individual and social elements relating alcoholism to suicide are very diverse, and the causes of both behaviors are complex. It seems unlikely that a single direct causal mechanism exists between them (Stenback and Blumenthal, 1964).

To be sure, the data suggest some sort of relationship. Even taking into account a broad margin for methodological difficulties, alcoholics do end their lives in suicide uncommonly frequently, samples of suicides do include disproportionately high numbers of people with drinking problems, and drinking is a common accompaniment to suicide. But beyond these elementary associations, the picture is unclear. With respect to common-sense knowledge, suicide is regarded as (or even defined by) an act involving the intention for self-destruction. This fact alone may account for some of the halting quality of suicide explanations: acts defined by intentions are the deeds of men and women, rather than the mindless or unintended workings-out of factors and forces and variables that a scientific approach to the "behavior" might involve. Thus, we expect that behind a suicide is "a story" rather than the expression of one or another "law of behavioral science."

Equivalently, accounts of the links between alcoholism and suicide often appear to stick close to common-sense knowledge and fit alcoholism into suicide as it might be fitted in the suicide "stories" that form our accounts of events in everyday thought. The line-up of hypotheses connecting suicide and alcoholism hence contains few surprises.

Some of the theories that would explain the association of alcohol abuse and suicide are offshoots of the different perspectives to the study of suicide itself, focusing on psychological or social factors as the important

casual links. Psychological studies often consider excessive alcohol use to be an indication of a suicidal personality. One type of problem drinking associated with suicidal behavior occurs in those suffering from depressive illness, who will often increase their alcohol consumption markedly during a bout of depression. These episodes commonly last as long as six months and not infrequently precede a suicide attempt or completed suicide. The relation of longer term alcohol problems to suicide is explained somewhat differently. Many psychological models invoke Menniger's theory of alcoholism as chronic suicide, a mode of self-destruction that differs from an overt suicide attempt in its slowness and unconscious intentionality but not its eventual aim. "Alcohol addiction can be thought of not as a disease, but as a suicidal flight from disease, a disastrous attempt at the self cure of an unseen inner conflict" (Menninger, 1938, p. 168).

If nothing else, the imagery seems unassailable: self-destruction manifests itself slowly through alcoholism and quickly through a life-ending action. But--perhaps as is common among accounts that seem quite satisfying to common-sense--the self-destructiveness model presents us with difficulties of interpretation and validation.

Consider some of the questions it raises: if alcoholism and suicide are forms of self-destructiveness, should we expect to find them correlated negatively, positively, or uncorrelated across a group of populations or a group of individuals? It seems that all three answers might be acceptable: self-destruction prone people might use suicide as the preferred alternative to alcoholism (or vice versa), or the slow pace of death by alcoholism might be sacrificed for a quick suicide

at some point, or finally, both motifs might occur in the population, thereby cancelling out any directional correlation between the two.

The Menninger hypothesis by itself is thus too abstract and vague to make determinate predictions about the real world for us to test.

Or, on the other hand, if the notions that suicide and alcoholism were expressions of underlying self-destructiveness were true, what should we expect of populations of suicides and populations of alcoholics? Should they be similar to each other demographically or psychologically or, on the other hand, can they differ? For instance is the fact that the sex ratio among alcoholics differs from the sex ratio among suicides, and differs dramatically from the sex ratio among attempted suicides, a good or a bad fact for the self-destructiveness hypothesis? Strictly speaking, it might be argued that alcoholics and suicides should show a great deal of similarity, but with equal force it seems it could be argued that self-destructiveness in men and in women is subject to molding by cultural and sex-related forces, so that dissimilarities between the sexes should be expected.

In many ways the theory explains too much: not all alcoholics are suicidal, as it would suggest and not all commit suicide directly or drink themselves to death. Some studies of alcoholics meet this problem by distinguishing two overlapping populations of those who were suicidal and those who were not, with the suicidal group demonstrating such characteristics as having been a younger child in their family, being more self-critical, and displaying more neuroticism in their drinking behavior (Koller and Castanos, 1968; Ritson, 1968). The self-destructiveness of alcoholics may thus be seen in only part of the alcoholic population, and may well be precipitated by

early experiences, specific personality factors, or perhaps by social conditions that result from their alcoholism.

A second important theoretical approach suggests that classically-defined disease alcoholism often (i.e., relatively often) may cause suicide: the addiction to alcohol, a blind force sweeping through the alcoholic's health and happiness, drives the alcoholic to suicide. It is claimed that behavioral manifestations of alcoholism can lead to deteriorations of important social relationships, which will lead to the conditions of social disintegration, anomie, etc., that are considered by various sociologists to be important precipitants of suicide. Working from this hypothesis, it is common to find researchers trying to establish whether alcoholism preceded, went along with, or followed on the depression, hopelessness, and accumulating troubles that are thought to occasion the suicidal act.

One study that strongly suggested that social integration was an important factor in the suicidal behavior of alcoholics was conducted by Palola et al. (1962). They compared suicide attempts of two groups of labelled alcoholics, a sample of men currently living in a skid row environment and a sample of alcoholics who had joined Alcoholics Anonymous. In the total sample of 123 men, 17% admitted to having made a suicide attempt at some time in their lives. Surprisingly, twice as many in the Alcoholics Anonymous sample (24%) as in the skid row sample (12%) admitted to this. These differences could have been partially due to the class differences between the two groups or to the greater willingness of the "ex-alcoholics" in Alcoholics Anonymous than of the group containing chronic alcoholics in a slum environment to admit to past deviance.

One study of alcoholism and suicidal behavior suggested that both psychological and sociological factors might reinforce one another, leading to different suicidal outcomes at various points in the alcoholic's career. Palola et al. (1962) postulated that alcoholism may well be an ambivalent suicidal flight from disease, that may for a time serve as substitute against total self-destruction. Often suicide attempts occurred early in alcoholics' drinking careers; these are seen as ambivalent attempts made as a call for help or in a desire to "get away" from inner conflicts. In many instances, attempters then continued their drinking careers for ten or fifteen years beyond those early attempts. Their excess drinking, while able to alleviate their internal problems, leads to other serious external problems such as loss of employment, change in social integration, and especially loss of their spouses through divorce or separation. These social consequences in turn can prove to be the primary predisposing conditions responsible for completed suicides in alcoholics. This conclusion was reached both in this study and in one done in England where it was found that "the older alcoholic is the greater suicide risk--the longer alcoholism persists, the more likely it is to cause the adverse personal, social and health changes which may increase risk of suicide" (Barracough, et al., 1974, p. 363).

The various theories on alcoholism and suicide do not indicate a ready formula for reducing the problem. The data tend to show that merely removing the alcohol from the situation would not necessarily reduce the incidence of suicidal behavior. Indeed there is evidence to suggest that abrupt discontinuation of drinking can lead to suicide in alcoholics. Two Danish researchers using Antabuse as a treatment for alcoholism were shocked to discover how many of the patients committed suicide after the treatment. They suggested that those patients were no longer able to escape by means of the alcohol, and found suicide the only way out. This interpretation would seem to confirm the idea of alcoholism being a substitute for suicide

(Norvig and Nielson, 1956). The protective function of alcohol was also noted by Motto, who found that "a history of past alcoholism . . . appears more closely associated with suicide in our sample than current alcohol abuse" (Motto, et al., 1974, p. 91).

Hudolin found that when some alcoholics cease drinking during treatment they can become acutely depressed, often having suicidal thoughts. This condition can grow in intensity until it develops into a dangerous problem, occasionally resulting in a suicide that seems motiveless. He suggests however that abstinence allows alcoholics to realize the situation of their lives, and it is this comprehension of the problems that have accumulated because of their drinking that leads to a depressive reaction, even in those who were never previously burdened with depression before becoming alcoholics (Hudolin, 1970, p. 150).

The Los Angeles Suicide Prevention Center has instituted a special project to identify high risk alcoholics and to work closely with them in treating their suicidal predispositions. It is felt that once the immediate threat of self-destruction is lifted, they can be motivated to seek treatment for their alcohol problems.*

The prevention of suicide is always a difficult problem and especially so when alcohol abuse is involved. While the studies have shown that most alcoholics are not suicidal and do not kill themselves, those who are high risks can prove very resistant to identification and treatment. It is clear that there is much more that must be learned about suicide and the role alcohol has in it.

*Personal communication from Dr. Carl Wold.

SUICIDE BIBLIOGRAPHY

- Achte, K.A. and Ginman, L.
1966 "Suicidal attempts with narcotics and poisons." Acta Psychiatrica Scandinavica, Vol. 42, No. 2, pp. 214-232.
- Achte, K.A. and Lönnquist, J.
1971 "Suicide and social class." Psychiatrica Fennica, pp. 239-246.
- Alha, A., Uotila, U. and Tamminen, V.
1974 "Oileuslaaketieteellisissä ruumiinavauksissa todettu alkoholi." (Alcohol found in autopsies), Suomen Laakarilehti, Vol. 29, pp. 3021-3024.
- Alvarez, A.
1973 The Savage God. New York: Random House.
- Arner, Oddvar
1970 "The role of alcohol in fatal accidents among seamen." Presented at The Third International Conference on Alcoholism and Addictions, Cardiff, September 1970.
- Arieff, A.; McCulloch, R. and Rotman, D.B.
1948 "Unsuccessful suicidal attempts." Diseases of the Nervous System, Vol. 9, pp. 174-179.
- Attkisson, C.C.
1970 "Suicide in San Francisco's skid row." Archives of General Psychiatry, Vol. 23, pp. 149-157.
- Bailey, W.B.
1904 "Suicides in the United States 1897-1901." Yale Review, Vol. 12, pp. 70-92.
- Barraclough, B.; Bunch, J.; Nelson, B. and Sainsbury, P.
1974 "A hundred cases of suicide: Clinical aspects." British Journal Of Psychiatry, Vol. 125, pp. 355-373.
- Battegay, R.
1965 "Selbstmordprophylaxe bei Süchtigen." Z. Präventivmed., Vol. 10, No. 6, pp. 440-454.
- Batchelor, I.R.C.
1954 "Alcoholism and attempted suicide." Journal of Mental Science, Vol. 100, pp. 451-461.
- Beck, A.; Beck, R. and Kovacs, M.
1975 "Classification of suicidal behaviors: I. Quantifying intent and medical lethality." American Journal of Psychiatry, Vol. 132, No. 3, pp. 285-287.

- Beck, A.; Weissman, A. and Kovacs, M.
1976 "Alcoholism, hopelessness, and suicidal behavior." Journal of Studies on Alcohol, Vol. 37, No. 1, pp. 66-77.
- Benensohn, H. and Resnik, H.
1974 "A jigger of alcohol, a dash of depression, and bitters: A suicidal mix." Annals of the New York Academy of Sciences, Vol. 233, pp. 40-45.
- Blachly, P.H.; Disher, W. and Roduner, G.
1968 "Suicide by Physicians." Bulletin of Suicidology, pp. 1-18.
- Blath, R.A.; McClure Jr., J.N. and Wetzel, R.D.
1973 "Familial factors in suicide." Diseases of the Nervous System, Vol. 34, No. 2, pp. 90-93.
- Bowden K.M.; Wilson, D.W. and Turner, L.K.
1958 "A survey of blood alcohol testing in Victoria (1951-1956)." Medical Journal of Australia, Vol. 2, pp. 13-15.
- Bratfos, O.
1971 "Attempted suicide: A comparative study of patients who have attempted suicide and psychiatric patients in general." Acta Psychiatrica Scandinavica, Vol. 47, No. 1, pp. 38-56.
- Brenner, Berthold
1967 "Alcoholism and fatal accidents." Unpublished manuscript.
- Bridges, P.K. and Koller, K.M.
1966 "Attempted suicide: A comparative study." Comprehensive Psychiatry, Vol. 7, pp. 240-247.
- Cahalan, D. and Room, R.
1974 Problem Drinking Among American Men. New Brunswick: Rutgers Center of Alcohol Studies.
- Cahalan, D. and Treiman, B.
1976 Drinking Behavior, Attitudes, and Problems in San Francisco. Berkeley: Social Research Group, School of Public Health.
- Casper, L.
1825 Über den Selbstmord und seine Zunahme in unserer Zeit. Berlin. Quoted in Karl Dahlgren, Suicide and Attempted Suicide, Lund: Haken Ohlssons, 1945.
- Chandler, Jane; Hensman, C. and Edwards, G.
1971 "Determinants of what happens to alcoholics." Quarterly Journal of Studies on Alcoholism, Vol. 32, pp. 349-363.
- Choi, Sei Young
1975 "Death in young alcoholics." Journal of Studies on Alcohol, Vol. 36, pp. 1224-1229.

- Ciampi, L. and Eisert, M.
1969 "Mortalité et causes de décès chez les alcooliques." Social Psychiatry, Vol. 4, No. 4, pp. 159-168.
- Clark, W.B.
1966 "Operational definitions of drinking problems and associated prevalence rates." Quarterly Journal of Studies on Alcohol, Vol. 27, No. 4, pp. 648-668.
- Cutler, R. and Morrison, N.
1971 "Sudden death: A study of characteristics of victims and events leading to sudden death in British Columbia with primary emphasis on apparent alcohol involvement and Indian sudden death." Alcoholism Foundation of British Columbia.
- Dahlgren, K.G.
1945 On Suicide and Attempted Suicide. Lund: Haken Ohlssons.
- Daumézon, G.; Cor, T. and Rudauf, T.
1955 "Données statistiques sur les tentatives de suicide chez les alcooliques entres a l'Admission de Ste-Anne." Ann. Med. Psychol., Vol. 113, No. 11, pp. 286-292.
- Davies, Karl M.
1965 "The Influence of Alcohol on Mortality." Proceedings of Home Office Life Underwriters Association, Vol. 46, pp. 159-179.
- Deasy, Sean; Ruppert, Gerald and Nordmoe, Dennis
1973 "County of Wayne 1972: Alcohol related violent deaths." Report Detroit Department of Health, Division of Alcoholism, Bureau of Substance Abuse, Michigan, May 8, 7 pp.
- Derrick, E.H.
1970 "A Survey of the mortality caused by alcohol." Medical Journal of Australia, pp. 914-999.
- Dijk, W.K. van; Dijk-Hoffeman, A. van
1973 "A follow-up study of 211 treated male alcohol addicts." British Journal of Addiction, Vol. 68, No. 1, March, pp. 3-24.
- Dorpat, Theodore L. and Ripley, Herbert S.
1960 "A study of suicide in the Seattle area." Comprehensive Psychiatry, Vol. 1, No. 6, pp. 349-359.
- Dorpat, Theodore L. and Ripley, Herbert S.
1962 "A study of suicide in King County, Washington." Northwest Med., Vol. 61, pp. 655-661.
- Dorpat, Theodore L. and Ripley, Herbert S.
1967 "The relationship between attempted suicide and committed suicide." Comprehensive Psychiatry, Vol. 8, No. 2.
- Durkheim, Emile
1951 Suicide--A Study in Sociology. Trans. by John Spaulding and G. Simpson, Glencoe, Ill.: The Free Press.

- Edwards, J.E. and Whitlock, F.A.
1968 "Suicide and attempted suicide in Brisbane: 2." Medical Journal of Australia, Vol. 1, No. 23, pp. 989-995.
- Efron, V.; Keller, M. and Gurioli, C.
1974 "Statistics on consumption of alcohol and on alcoholism." New Brunswick, New Jersey: Rutgers Center of Alcohol Studies.
- Epps, P.
1957 "Women in prison on 'attempted suicide' charges," Lancet, Vol. 273, pp. 182-84.
- Ettlinger, Ruth
1975 "Evaluation of suicide prevention after attempted suicide." Acta Psychiatrica Scandinavica, Suppl. 260, pp. 51-133.
- Ettlinger, R. and Flordh, P.
1955 "Attempted suicide: Experience of five hundred cases at a general hospital." Acta. Psych. of Neurol. Scand., Suppl. 103, pp. 5-45.
- Farberow, Norman L.
1972 Bibliography on Suicide and Suicide Prevention. Rockville, Md.: National Institute of Mental Health.
- Farberow, N.L., et al.
1973 "Research in Suicide." In H.L.P. Resnik and Berkley Hathorne, eds. Suicide Prevention in the 70s, Rockville, Md.: NIMH.
- Farberow, N.L. and Simon M.
1968 "Suicides in L.A. and Vienna." Pub. Health Reports, Vol. 84, pp. 389-403.
- Freud, S.
1957 "Mourning and Melancholia." Pp. 243-258 in The Standard Edition of the Complete Psychological Works of Sigmund Freud, Vol. 14, London: Hogarth.
- Gabriel, E.
1935 "Uber die Todesursachen bei Alkoholikern." Z. ges. Neurol. Psychiat., Vol. 153, pp. 385-406.
- Gardner, E.A.; Bahn, A. and Mack, M.
1964 "Suicide and psychiatric care in the aging." Archives of General Psychiatry, Vol. 10, pp. 547-553.
- Garzotto, N.; Siani, R., Tansella, C.Z. and Tansella, M.
1976 "Cross-validation of a predictive scale for subsequent suicidal behavior in an Italian sample." British Journal of Psychiatry, Vol. 128, pp. 137-140.
- Gay, T.J.; Coates, R.L.; Coggins, G.L.; Alexander, K.D. and Nayman, J.
1970 "Blood alcohol concentrations upon admission to a hospital casualty department." Medical Journal of Australia, Vol. 2, pp. 778-781, October 24.
- Giffen, P.J., et al.
1971 "The Chronic Drunkenness Offender: Ages and Causes of Death in the Chronic Drunkenness Offender." Toronto: Alcoholism and Drug Addiction Research Foundation Substudy 1-11&K&24&T&Ma-71.

- Glatt, M.M.
1954 "Suicidal Attempts in Alcoholics." British Medical Journal,
Vol. 2, p. 303.
- Goffman, E.
1961 Asylums. Garden City, New Jersey: Doubleday.
- Goodwin, Donald W.
1973 "Alcohol in suicide and homicide." QJSA, Vol. 34, pp. 144-156.
- Gorceix, A. and Zimbacca, N.
1965 "Études des dossiers de suicide enregistrés en dans le département
de la Seine en 1962." Ann. Méd-lég., Vol. 45, pp. 20-28.
- Haberman, Paul and Baden, Michael
1974a "Alcoholism and violent death." QJSA, Vol. 35, pp. 221-231.
- Haberman, Paul and Baden, Michael
1974b "Drinking, drugs, and death." The International Journal of the
Addictions, Vol. 9, No. 6, pp. 761-773.
- Hansen, G. and Jentzsch, G.
1956 "Über die Mitwirkung des alcohol bei gewaltsamen and natürlichen
Todesursachen" (On the contribution of alcohol to violent and natural
causes of death). Dtsch. Gesundheitswes., Vol. II, pp. 1737-1745.
- Harenko, A.
1967 "Alcoholin osallisuus myrkytysitsemurhayrityksissa Helsingissa v
1962-64" (The role of alcohol in attempted suicides by poisoning in
Helsinki in 1962-64). Suomen Laakarilehti, Vol. 22, pp. 109-115.
- Hassall, Christine
1969 "Development of alcohol addiction in young men." British Journal
Prev. Soc. Med., Vol. 23, No. 1, pp. 40-44.
- Heller, A.
1900 "Zur Lehre vom Selbstmord nach 300 Sectionen." Munchener Med.
Wschr., Vol. 47, No. 48, pp. 1653-1658.
- Hendin, H.
1965 Suicide and Scandinavia. New York: Doubleday.
- Hendin, H.
1969 Black Suicide. New York: Basic Books, Inc., Publishers.
- Henry, A.F. and Short, J.F.
1954 Suicide and Homicide. Glencoe, Ill.: Free Press.
- Honkanen, Risto and Visuri, T.
1976 Alcohol Involvement in Accidents, Dept. of Public Health Sci.,
Univ. Helsinki, Helsinki, Finland.

- Hudolin, V.
1970 "Acute complications of alcoholism" in R.E. Popham, ed.
Alcohol and Alcoholism, Toronto: Univ. of Toronto Press, pp. 140-159.
- Ipsen, J.; Moore, M. and Alexander, L.
1952 "Prevalence of alcoholism in the population and among suicides
and accidents from poisoning, Massachusetts, 1938-1948." QJSA, Vol. 13,
No. 2, pp. 204-214.
- James, I.P.
1966 "Blood alcohol levels following successful suicide." QJSA, Vol. 27,
No. 1, pp. 23-29.
- James, I.P.
1972 "Self-poisoning and alcohol." Lancet, Vol. 2, pp. 1260-1261.
- James, I.P., et al.
1963 "Blood alcohol levels following attempted suicide." Journal of
Studies on Alcohol, Vol. 24, No. 1, pp. 14-22.
- Johnson, F.G.; Ferrence, B.A. and Whitehead, P.C.
1973 "Self-injury, identification and intervention." Canadian Psy-
chiatric Association Journal, Vol 18, No. 2, pp. 101-105.
- Kahne, M.J.
1966 "Suicide Research." International Journal of Social Psychiatry,
Vol. 12, pp. 177-186. Quoted in David Lester, Why People Kill Them-
selves, Springfield, Ill.: Charles C. Thomas, 1972.
- Kendell, R.E. and Staton, M.C.
1966 "The fate of untreated alcoholics." QJSA, Vol. 27, No. 1, pp. 30-41.
- Kessel, Neil
1965 "Self-poisoning I." British Medical Journal, Vol. 5473, pp. 1265-
1270.
- Kessel, N. and Grossman, G.
1961 "Suicide in alcoholics." British Medical Journal, Vol. 2,
pp. 1671-1672.
- Koller, K.M. and Castanos, J.N.
1968 "Attempted suicide and alcoholism." Medical Journal of Australia,
Vol. 2 No. 19, pp. 835-837.
- Krieger, G.
1967 "Suicides in San Mateo County." Calif. Med., Vol. 107, pp. 153-157.
- Krupinski, J.; Polke, P and Stoller, A.
1965 "Psychiatric disturbances in attempted and completed suicides in
Victoria during 1963." The Medical Journal of Australia, Vol. 2,
No. 19, pp. 773-778.
- Kreitman, N.
1972 "Suicide in Scotland in comparison with England and Wales."
British Journal of Psychiatry, Vol. 120, pp. 83-87.
- Lahelma, Eero
1977 "Alcohol-related casualties and social problems in the Nordic
countries." Berkeley, CA.: Social Research Group working paper F-54.

- Landstrom, T.
1964 "Själv mord i Sverige" (Suicide in Sweden), Alkoholfragan, Vol. 58, pp. 402-403.
- Lemere, F.
1953 "What happens to alcoholics." American Journal of Psychiatry, Vol. 109, pp. 674-676.
- Lerch, Doris
1959 "Administrative Trinkerverorgung und Antabuskuren in Basel in den Jahren 1947-1957 und ihre Ergebnisse." Z. Präventivmed., Vol. 4, No. 11, pp. 381-398.
- Lester, David
1972 Why People Kill Themselves. Springfield, Ill.: Charles C. Thomas.
- Lester, David and Beck, Aaron
1975 "Attempted suicide in alcoholics and drug addicts." Journal of Studies on Alcohol, Vol. 36, No. 1, pp. 162-164.
- Lint, Jan de and Levinson, T.
1975 "Mortality among patients treated for alcoholism: A five-year follow-up," Canadian Medical Association Journal, Vol. 113, pp. 385-387.
- Litman, Robert; Farberow, Norman; Wold, Carl and Brown, Timothy
1974 "Prediction models of suicidal behavior." In Aaron Beck, Harvey Resnik, and Dan Lettieri, eds. The Prediction of Suicide, Bowie, Maryland: The Charles Press Publishers, Inc.
- Lousdorf, R.G.
1968 "Legal Aspects of Suicide." pp. 135-143 in H.L.P. Resnick ed., Suicidal Behaviors, Diagnosis and Management, Boston: Little Brown and Co.
- Martin, Walter T.
1968 "Theories of variation in the suicide rate." pp. 74-96 in J. Gibbs, ed., Suicide, New York: Harper and Row.
- Mayfield, D. and Montgomery, D.
1972 "Alcoholism, alcohol intoxication, and suicide attempts." Archives of General Psychiatry, Vol. 27, No. 3, pp. 349-353.
- McCulloch, J.W. and Philip, A.E.
1972 Suicidal Behaviour. Oxford: Pergamon Press.
- Medhus, Asbjorn
1975 "Mortality among female alcoholics." Scand. J. Soc. Med., Vol. 3, pp. 111-115.
- Menninger, Karl
1938 Man Against Himself, N.Y.: Harcourt Brace & Co.
- Minkoff, K.; Bergman, E.; Beck, A. and Beck, R.
1973 "Hopelessness, depression, and attempted suicide." American Journal of Psychiatry, Vol. 130, pp. 455-459.

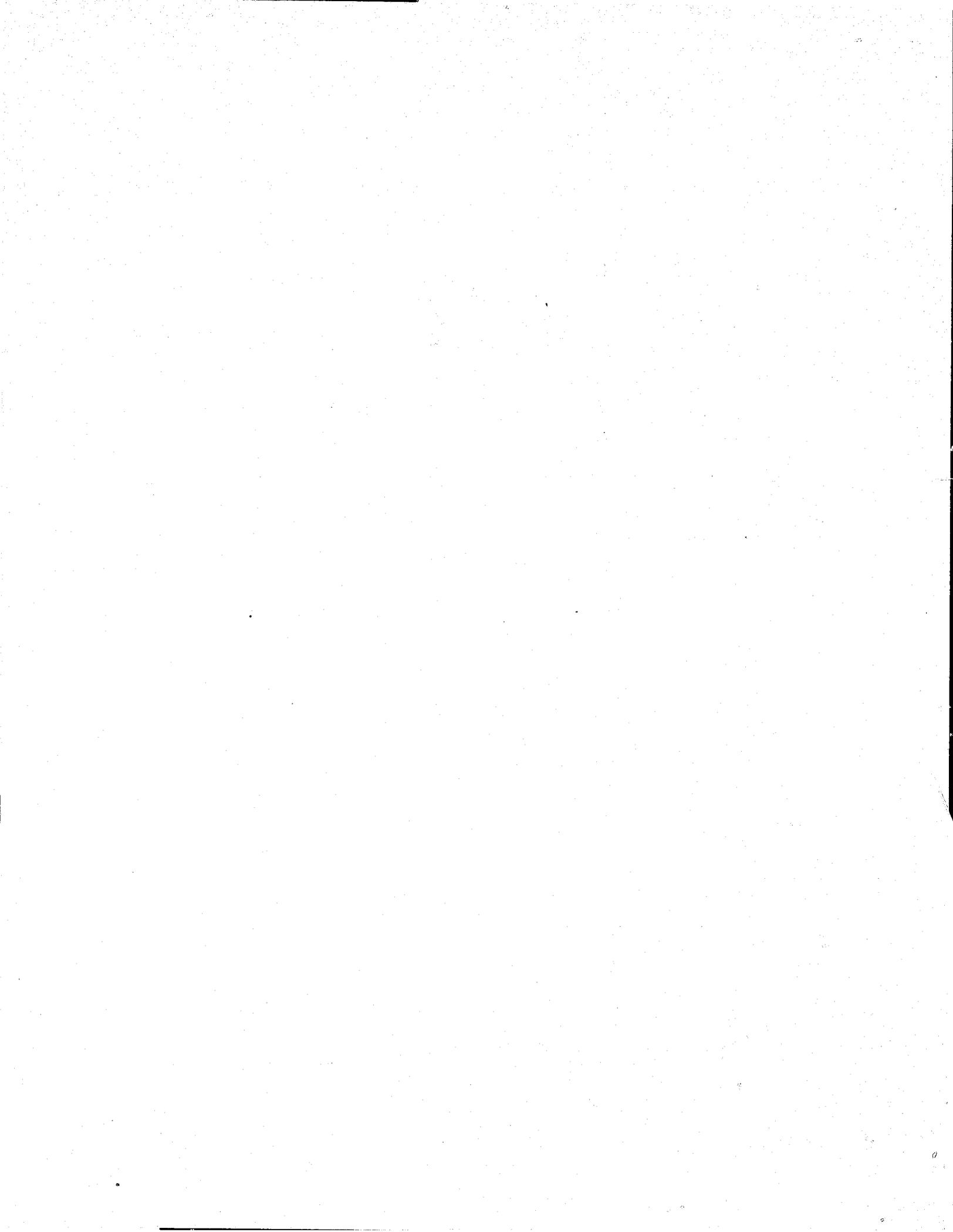
- Moore, Merrill
1939a "Alcoholism and attempted suicide." New England Journal of Medicine, Vol. 221, No. 18, pp. 691-693.
- Moore, Merrill
1939b "Alcoholism and suicide." Journal of Nervous and Mental Disease, Vol. 90, pp. 381-385.
- Morgan, H.G.; Burns-Cox, C.J.; Pocock, H. and Pottle, S.
1975 "Deliberate self-harm: Clinical and socio-economic characteristics of 368 patients." British Journal of Psychiatry, Vol 127, pp. 564-574.
- Morrison, J. and Pendery, M.
1974 "Suicidal behavior during alcoholic blackouts." QJSA, Vol. 35, pp. 657-659.
- Motto, Jerome
1974 "Refinement of variables in assessing suicide risk." in A. Beck, H.P. Resnik, and D. Lettieri. The Prediction of Suicide. Bowie, Maryland: The Charles Press Pub., Inc., pp. 85-93.
- Movahedi, S.
1975 "Loading the dice in favor of madness." Journal of Health and Social Behavior, Vol. 16, No. 2, June, pp. 192-197.
- Murphy, G.E. and Robins, E.
1967 "Social factors in suicide." Journal of the American Medical Association, Vol. 199, pp. 303-308.
- Department of Justice, New Zealand
1968 "Crime in New Zealand," R.E. Owen, Government Printer.
- Nicholls, P.; Edwards, G and Kyle, E.
1974 "Alcoholics admitted to four hospitals in England." QJSA, Vol. 35, No. 3, pp. 841-855.
- Nielson, Tore; Dorpat, T. and Jackson, Joan
"Self-destructiveness in alcoholics." Unpublished paper.
- Norvig, J. and Nielson, B.
1956 "A follow-up study of 221 alcoholics in Denmark." QJSA, Vol. 17, pp. 633-642.
- Ohara, Kenshiro
1972 "Alcoholism and self-destruction." Paper presented at 30th International Congress on Alcoholism and Drug Dependence, Amsterdam.
- Ovenstone, Irene
1973 "A psychiatric approach to the diagnosis of suicide and its effect upon the Edinburgh statistics." British Journal of Psychiatry, Vol. 123, pp. 15-21.

- Ovenstone, I.M and Kreitman, N.
1974 "Two syndromes of suicide." British Journal of Psychiatry, Vol. 124, pp. 336-345.
- Pallis, D.J. and Birtchnell, J.
1976 "Personality and suicidal history in psychiatric patients." Journal of Clinical Psychiatry, Vol. 32, No. 2, pp. 246-253.
- Palola, E.; Dorpat, T. and Larson, W.
1962 "Alcoholism and suicidal behavior." Pp. 511-534 in D.J. Pittman and C.R. Synder, eds. Society, Culture, and Drinking Patterns, New York: Wiley.
- Patel, N.S.
1974 "A study on suicide." Med. Sci. Law, Vol. 14, No. 2, pp. 129-136.
- Pederson, A.; Tefft, B and Babigian, H.
1975 "Risks of mortality of suicide attempters compared with psychiatric and general populations." Suicide, Vol. 5, No. 3, pp. 145-157.
- Pell, Sidney and D'Alonzo, C.A.
1973 "A five-year mortality study of alcoholics." J. Occup. Med., Vol. 15, pp. 120-125.
- Pitts, F.N. and Winokur, G.
1964 "Affective disorders." Journal of Nervous and Mental Disease, Vol. 139, pp. 176-181.
- Pokorny, A.D.
1965 "Human violence: A comparison of homicide, aggravated assault, suicide, and attempted suicide." Journal of Criminal Law, Criminology, and Police Science, Vol. 56, No. 4, pp. 488-497.
- Prevention of Suicide
1968 WHO Public Health Papers, No. 35, World Health Organization, Geneva.
- Ringel, E. and Rotter, H.
1957 "The problem of attempted suicide during intoxication." Wien Z. Nervenheilk, Vol. 13, pp. 406-416.
- Ripley, Herbert
1973 "Suicidal behavior in Edinburgh and Seattle." American Journal of Psychiatry, Vol. 130, No. 9, pp. 995-1001.
- Ritson, E.R.
1968 "Suicide amongst alcoholics." British Journal of Medical Psychology, Vol. 41, pp. 235-242.
- Robins, E.; Schmidt, E.H. and O'Neal, P.
1957 "Some interrelations of social factors and clinical diagnosis in attempted suicide: A study of 109 patients." American Journal of Psychiatry, Vol. 114, pp. 221-231.

- Robins, E.; Gassner, S. and Kayes, J.
1959a "The communication of suicidal intent: Study of 134 cases of completed suicide." American Journal of Psychiatry, Vol. 115, pp. 724-733.
- Robins, E.; Murphy, G.E.; Wilkinson, R., et al.
1959b "Some clinical considerations in the prevention of suicide based on a study of 134 successful suicides." American Journal of Public Health, Vol. 49, pp. 888-899.
- Room, R.
1976 "Comments on the Uniform Alcoholism and Intoxication Treatment Act." Journal of Studies on Alcohol, Vol. 37, No. 1, January, pp. 113-144.
- Ross, M.
1971 "Suicide among physicians." Psychiatry Med., Vol. 2, No. 3, pp. 189-198.
- Rosen, Albert
1954 "Detection of suicidal patients: An example of some limitations in the prediction of infrequent events." Journal of Consulting Psychology, Vol. 18, No. 6.
- Rudenstam, K.E.
1972 "Demographic factors in suicide in Sweden and the United States." International Journal of Social Psychiatry, Vol. 18, No. 2, pp. 79-90.
- Rüegsegger, P.
1963 "Selbstmordversuche." Psychiat. Neurol., Basel, Vol. 146, pp. 81-104.
- Rushing, W.A.
1968a "Alcoholism and suicide--rates by status set and occupation." QJSA, Vol. 29, pp. 399-412.
- Rushing, W.A.
1968b "Individual Behavior and Suicide." in J. Gibbs, ed., Suicide, New York: Harper and Row.
- Rushing, W.A.
1969 "Suicide and the interaction of alcoholism (liver cirrhosis) with the social situation." QJSA, Vol. 30, pp. 93-103.
- Russell, J.A., and Mehrabian, A.
1975 "The mediating role of emotions in alcohol use." Journal of Studies on Alcohol, Vol. 36, No. 11, pp. 1508-1536.
- Sainsbury, P.L.
1955 Suicide in London. London: Chapman & Hall.
- Schmid, Calvin F. and Van Ausdol. M.D.
1955 "Completed and attempted suicide." American Sociological Review, Vol. 20, pp. 273-283.

- Schmid, C.F.
1933 "Suicide in Minneapolis, Minnesota: 1928-1932." American Journal of Sociology, Vol. 39, No. 1, pp. 30-48.
- Schmidt, E.H.; O'Neal, P and Robins, E.
1954 "Evaluation of suicide attempts as guide to therapy. Clinical and follow-up study of 109 patients." Journal of the American Medical Association, Vol. 155, pp. 549-557.
- Schmidt, W, and de Lint, J.
1972 "Causes of death of alcoholics." Quarterly Journal of Studies on Alcohol, Vol. 33, No. 1, pp. 171-185.
- Schneider, Pierre B.
1954 La Tentative de Suicide. Neuchatel: Delachaux et Niestle.
- Schuckit, Marc and Gunderson, Eric
1974 "Deaths among young alcoholics in the U.S. Naval Service." QJSA, Vol. 35, pp. 856-862.
- Schur, F.M.
1970 Labeling Deviant Behavior. New York: Harpers & Row.
- Shneidman, Edwin and Farberow, N.
1965 "Statistical comparisons between attempted and committed suicides." in N. Farberow and E. Shneidman, eds., The Cry For Help, New York: McGraw Hill.
- Spain, D.; Bradess, V. and Eggston, A.
1951 "Alcohol and violent death. A one-year study of consecutive cases in a representative community." Journal of the American Medical Association, Vol. 146, No. 4, pp. 334-335.
- Stenback, A. and Blumenthal, M.
1964 "Relationship of alcoholism, hypochondria and attempted suicide." Acta Psychiat. Scand., Vol. 40, pp. 133-140.
- Stenback, A.; Ach e, K. and Rimon, R.
1965 "Physical disease, hypochondria, and alcohol addiction in suicides committed by mental hospital patients." British Journal of Psychiatry, Vol. 111, pp. 933-937.
- Stengel, E. and Cook, N.G.
1958 Attempted Suicide. London: Chapman and Hall.
- Sterling-Smith, Robert
1974 "A Medical Toxicology Index: An Evaluation of Commonly Used Suicidal Drugs." in Aaron Beck, Harvey Resnik, Dan Lettieri, eds., The Prediction Of Suicide, Bowie, Md.: The Charles Press Publishers.
- Sundby, Per
1967 Alcoholism and Mortality. Oslo, Norway: Universitetsforlaget.
- Tabachnick, Norman; Gussen, John; Litman, R.; Peck, M.; Tiber, N. and Wold, C.
1973 Accident or Suicide? Springfield, Ill.: Charles C. Thomas.

- Tashiro, M. and Lipscomb, W.R.
1963 "Mortality experience of alcoholics." QJSA, Vol. 24, pp. 203-212.
- Tuckman, J. and Lavell, M.
1958 "Study of Suicide in Philadelphia." Pub. Hlth. Rep., Vol. 73, No. 6, pp. 547-553.
- Tuckman, J. and Youngman, W.
1968 "Assessment of Suicide Risk in Attempted Suicide." in H.L.P. Resnik, ed., Suicidal Behaviors, Boston: Little Brown and Company.
- Virkkunen, M.
1971 "Alcoholism and suicides in Helsinki." Psych. Fennica, pp. 201-207.
- Virkkunen, M.
1972 "Sosiaalihuollossa olevien alkoholistien itsemurhat." Sosiaalinen Aikakauskirja, Vol. 65, pp. 219-222.
- Virkkunen, M. and Alha, A.
1970 "On suicides committed under the influence of alcohol in Finland in 1967." British Journal of Addiction, Vol. 65, pp. 317-323.
- Vital Statistics of the United States - 1972
1976 Rockville, Md.: U.S. National Center for Health Statistics.
- Wallinga, J.V.
1949 "Attempted suicide: A ten-year study." Dis. Nerv. System, Vol. 10, pp. 15-20.
- Whitehead, P.C.
1972 "Notes on the association between alcoholism and suicide." International Journal of Alcohol Addictions, Vol. 7, No. 3, pp. 525-532.
- Whitlock, F.A.
1975 "Suicide in Brisbane." Med. J. Australia, Vol. 62.
- Whitlock, F.A. and Schapira, K.
1967 "Attempted suicide in Newcastle upon Tyne." British Journal of Psychiatry, Vol. 113, pp. 423-434.
- Wilentz, W.C.
1953 "The alcohol factor in violent deaths." Am. Practit. Dig. Treat. Vol. 4, p. 21-22.
- Yessler, P.G., et al.
1961 "On the communication of suicidal ideas: II. Some Medical Considerations." Archives of General Psychiatry, Vol. 5, pp. 12-29.



CHAPTER SIX

ALCOHOL AND FAMILY ABUSE

by

Thomas Epstein

Tracy Cameron

Robin Room

TABLE OF CONTENTS

	<u>Page</u>
A. Introduction	527
B. Child Abuse and Neglect	531
1. Incidence and Theory	531
2. Empirical Data on Alcohol Involvement	534
C. Child Molesting	538
1. Incidence and Theory	538
2. Empirical Data on Alcohol Involvement	541
D. Marital Violence	549
1. Incidence and Theory	552
2. Existing Empirical Data on Alcohol Involvement	556
3. Some New Data	556
a. Belligerence in Domestic Disagreements over Drinking Behavior	559
b. Generalized Propensity to Fight	560
c. Alcohol-Related Fights in General	562
d. Concussions	565
E. Violence by Children	567
F. Conclusion	567
Bibliography	569

ALCOHOL AND FAMILY ABUSE

A. Introduction

The family has traditionally been viewed as a source of support and understanding. But the family is also an arena of physical aggression, violence, and abuse. It is the most common location of accidents, suicide, fire injury, and physical abuse. Yet intrafamilial violence, exclusive of homicide, is less explored than any other casualty discussed in this report. Little data exists on family abuse per se, and the presence of alcohol in the event is even more rarely noted, although popular literature has viewed alcohol as a major contributing factor in all aspects of family abuse.

The general rubric of family abuse actually covers several quite different specific casualties or "events": "child abuse" refers to physical injuries inflicted on children by their caretakers; "child neglect" refers to failures on the part of parents or other caretakers to perform such expected functions as nurturance, protection, or supervision; "child molesting" is reserved for the sexual abuse of children by adults; "marital violence" refers to physical aggression between husbands and wives.

The traditional sanctity of the family and of the home has to a large extent discouraged research in the area of family violence and abuse, except in the most extreme manifestations, as in murder and homicide. Existing research into these matters, as well as the criminal and other legal handling of these problems, has been troubled by the tenuous nature of the line separating criminal or socially unacceptable actions from normatively sanctioned and accepted behaviors. Even in modern Western cultures, regional, individual, and temporal variation exists in the boundaries

differentiating acceptable punishment or discipline of family members from untoward violence or aggression.

Although professional research on family abuse is a relatively recent undertaking, the events themselves are as old as the family itself. Since the family, in one form or another, exists in all cultures, the cross-cultural variation in the definition and characterization of family abuse is great. Thus, nearly every sort of event within the frame of family abuse was regarded at some time or in some cultural setting as conforming behavior, including family neglect, infanticide, wife-beating, and the killing of grandparents, parents, and siblings (see for example Mohr, 1964). In this country, laws against cruelty to children are only about 100 years old.

Even relatively small cultural differentiations (such as those between rural and urban America) or relatively short-term historical changes may have involved significant variations in the definition of family abuse. The piously executed woodshed whippings of youths in nineteenth century novels would be considered quite differently today, and city dwellers would regard them differently than country dwellers. Of course, violations of the norms on family relations also have been around for a long time and have been a common subject of private and public discussion.

In the professional research arena, the territory of family abuse is comprised of many different social definitions, social management implications, and research styles of the different sorts of events that make up the territory as a whole. Hence, the troubles of the family are subjects for a great variety of social institutions, and in each case their definitions of events and styles of research and thought will reflect differing concerns.

In the alcohol literature, family abuse has been discussed from several perspectives. The causal role of drinking in such family abuses as "wifewhipping" formed one of the major themes in temperance literature (Chipman, 1845). In the modern alcoholism literature, we find studies of the children of alcoholics (Chafetz et al., 1971; Cork, 1969); of the relation of alcoholism to the defaulting of such various family statuses and functions as breadwinning, homemaking, and sexual performance; and of spousal responses to alcoholism (Jackson, 1954; Lemert, 1960; Edwards et al., 1973). Even genetic studies, oriented around the topic of alcoholism heritability, indirectly supply data on the environmental implications for children of alcoholic parents (Goodwin et al., 1974). There are also studies now in progress comparing alcohol abusers and child abusers which concentrate either on discovering the psychological similarities of the two groups of abusers or on finding the extent to which these two groups overlap each other.

These studies of family problems in the alcoholism literature are generally oriented around chronic conditions and role impairments, rather than the occurrence of specific events; where events are noted or measured, they are regarded primarily as symptoms of a condition.

The professional research traditions in each of these specific areas of family abuse differ widely, both in their concern with alcohol as a factor in the events and in their image of alcohol as a causal variable. In general, however, as seen in Charts I, II, and III,^{*} empirical data on alcohol-involvement in all areas of family abuse is quite limited. Information on alcohol use at the time of the event and on the proportion of each event that can be attributed to excessive and problem drinkers or alcoholics is

*In Chapter One, Introduction.

available from only a small number of studies. Moreover, there are no studies in these literatures which systematically focus on the proportion of alcoholics who have histories of these specific family problems.

Historically, child molesting became a focus of a modest amount of criminological research in the early 1930s, mostly done in the context of research on sex offenses in general. Child abuse, as a territory for professional study, got a somewhat later start and grew slowly into a more substantial research investment in the mid 1960s. The modern medical "discovery" of child abuse can be traced to the development of X-ray technology: in 1946, Caffey, a pediatric radiologist, published his findings that fractures of the long bones and subdural hematoma often occur together in infants. He suggested the then novel idea that the common denominator of both injuries might be child abuse. X-rays also confronted radiologists with evidence of old fractures and other injuries in children being treated for a more recent injury. Interest, however, grew slowly, and this area's literature is for the most part a product of the 1960s and 1970s.

Despite its recent inception, child abuse and child neglect research has succeeded in attracting the attentions of a diversified group of academics and other professionals including researchers in the areas of sociology, psychology, social work and social welfare, medicine, and law. Of all the areas of family violence and abuse, the literature on child abuse and neglect is by far the most substantial.

Marital violence as a separate research topic is also a recent literature, although criminologists have long included assaultiveness and homicide occurring between husbands and wives as an undifferentiated area of study in general crime literature.

B. Child Abuse and Neglect

This section of the report will examine the incidence, explanatory theories, and alcohol involvement in instances of child abuse and neglect. Child molesting will be treated in the following section. Abuse and neglect, though in many ways quite different, are often considered as one event, or are at least regarded as having similar causal pathologies; hence, most of the theoretical and empirical literature does not differentiate between the two.

1. Incidence and Theory

Determining the true incidence of child abuse and neglect is problematic. Children are, of course, often unaware of their rights or may fear reprisal if they do report abuse. Also, society's general repugnance with the subject has resulted in a paucity of research in the area (Elmer et al., 1967; Lystad, 1975). As a result, official statistics reflect only a small proportion of the total frequency of the event and policy makers are forced to rely upon speculative estimates when drafting governmental responses to the problem.

The incidence statistics that are available vary greatly by researchers, location, year, and method. Gil's large nationwide survey of reported cases revealed a rate of 8.4 incidents of physical abuse per 100,000 in 1968. The rate appears to vary considerably between individual states (Gil, 1973). While only about 6,000 cases of abuse are authenticated nationwide each year (Gil, 1968), Kempe (1971) estimates the actual number of cases to be between 30,000 and 50,000 annually and Fontana (1973) speculates that only one of every hundred abusive events is ever reported. Another indicator of the true extent of child abuse in this country is the 1967 NORC (National Opinion Research Center) survey of self-reported criminal victimization. Three percent of the sample of families contacted claimed to have personal knowledge of families within which an incident of child abuse had occurred during the

preceding year. A recent nationwide probability survey concludes on the basis of self-reports that "parents kick, punch or bite as many as 1.7 million children a year, 'beat up' 460,000 to 750,000 more and attack 46,000 with knives or guns" (New York Times, March 20, 1977, p. E6). From these data we can conclude at least that child abuse as usually defined occurs extensively in the United States.

Within the field of child abuse two theoretical models have been most frequently discussed. The "psychological" or "clinical" model puts the primary focus on identifying the particular physical and mental factors that determine why one individual may be abusive while another is not. The "sociological" tries to identify those social conditions within the family or the culture which affect the rate of child abuse either in the United States generally or within particular subgroups (Lystad, 1975; Friedman, 1976). Both types of child abuse studies are oriented toward treatment and prevention.

There are also two basic types of operational definitions of abuse. The first one focuses solely on the outcomes of acts, that is, all physical injuries suffered by children, while the second one includes the element of "intentionality" of the acts. The problem with the first is that it groups together both accidental and non-accidental injuries, while the second relies to a great extent upon inference rather than direct observations of intent. Moreover, there is no standard set of criteria used to determine intentionality; rather, the criteria vary from study to study (Gil, 1973; Friedman, 1976).

Samples in research on child abuse are usually selected from hospitals, social service agencies, and court cases. With the exception of Gil's general population survey, all research has been limited to these often biased samples (Friedman, 1976). Several problems with this type of research limit its

generalizability. One of the major problems is the relatively small sample size of most studies. Another is the absence of adequate control groups. Third, as a result of including only officially reported cases of child abuse in their samples, the studies cannot take into account the great number of undetected cases. Since little is known yet concerning the ratio of reported to unreported incidents or of factors associated with reporting versus failure to report, it is impossible to generalize from this data (see above). Last, there are problems encountered in the use of existing case record material. Since the data are entered into the records by many different workers, the information recorded is often inconsistent. Much of this information (especially alcohol involvement variables) is based on general observations and impressions of the worker, and thus it is difficult to determine the accuracy of this material.

A further difficulty in recent studies which focuses on the similarities of "alcohol abusers" and child abusers is the intrusion of normative assumptions that drinking and parenting cannot go together. Thus Helfer warns concerning the assumptions of the comparative profile research that while use of legal and illegal drugs and alcohol is widespread, it is seen as not appropriate for parenthood. The tendency is then to try to correlate these problems with child abuse and neglect, the logic being that if you fail in one norm you will fail also as a parent. He then goes on to point out that, "The problems of nonconformity are quite separate issues from the rearing of emotionally and physically healthy children. It would seem more appropriate to judge parenting skills rather than conformity or nonconformity" (Helfer, 1976:105).

Alcohol involvement in child abuse and neglect has not been of significant or central concern to researchers in the main body of literature on these topics. When information on the relationship of alcohol and child

abuse and neglect is available, it is generally not considered by researchers in terms of any specific alcohol theory. However, such typical statements as "a fourth of the fathers...drank to excess" and "16 were drunk" (Johnson and Morse, 1968) appear as one in a series of evaluative statements concerning abusive parents made by particular caseworkers or researchers. The tacit theory in this research seems to view alcohol use and excessive drinking as symptomatic of a generally socially maladjusted personality.

2. Empirical Data on Alcohol Involvement

Research on child abuse and neglect, as seen in Tables F-1 and F-2, has more often focused on the drinking histories and drinking problems of child abusers than on the abusive parents' drinking prior to or during the act of child abusing. In the three studies which have reported data on drinking at the time of the abusive act, the proportion of child abusers who were drinking varies substantially (0-44%). Thus, generalization based on this limited data is not justified. However, the one available American study, a nationwide survey of child abuse (Gil, 1973), offers several interesting findings concerning the role of drinking in physical child abuse. In an effort to explore the many possible contributing causal contexts which may precipitate incidents of physical child abuse, social workers completed a checklist of circumstances that were either present or absent in each case of child abuse. Included in this checklist of 18 items was one item concerning "alcoholic intoxication of perpetrator." This item was checked for only 13% of the child abuse cases. In comparison, "immediate or delayed response to specific act of child" and "inadequately controlled anger of perpetrator" were present in 63% and 73% of the cases, respectively. However, in only 22% of the cases did the social worker check "misconduct of child by community standards,"

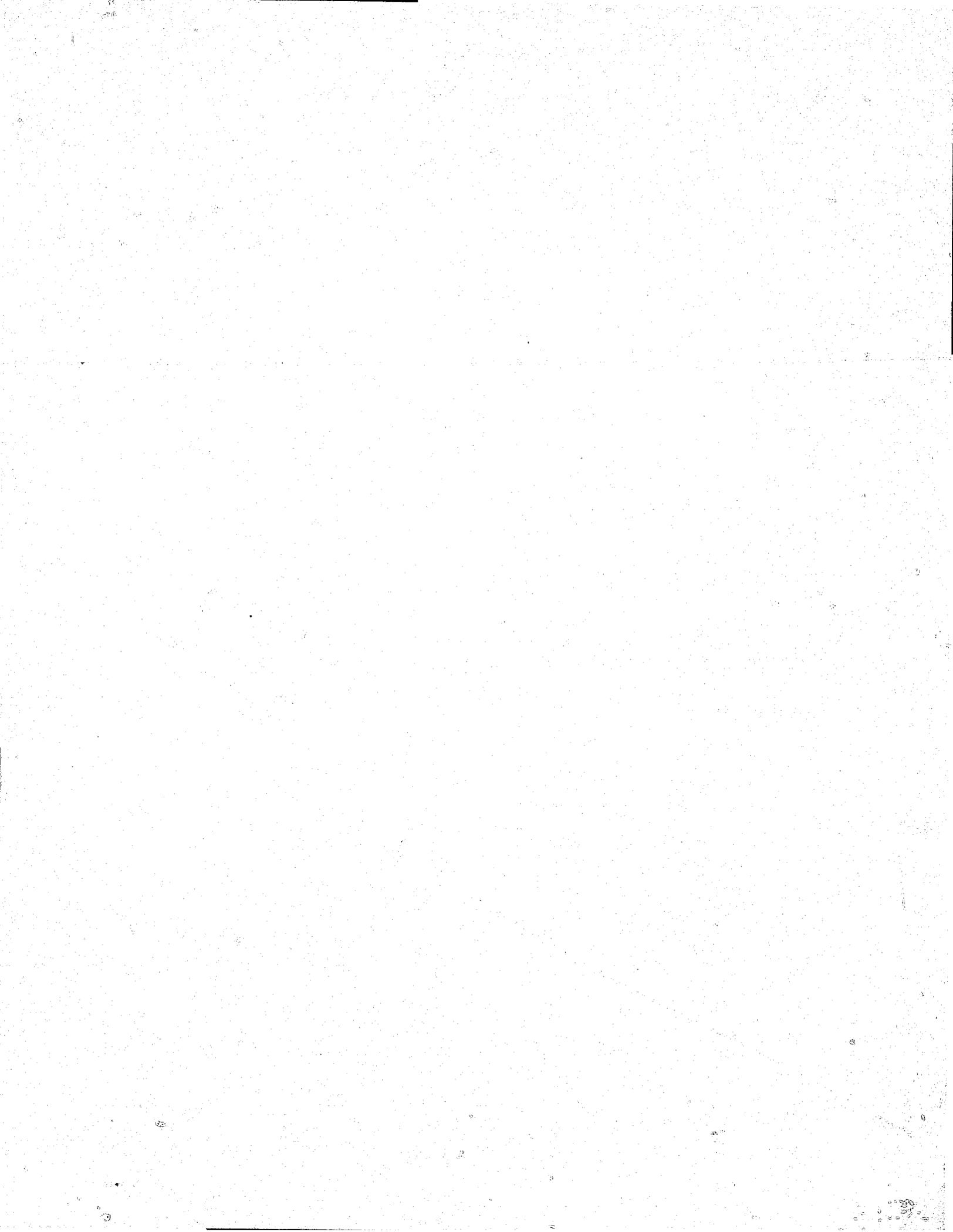


Table F-1

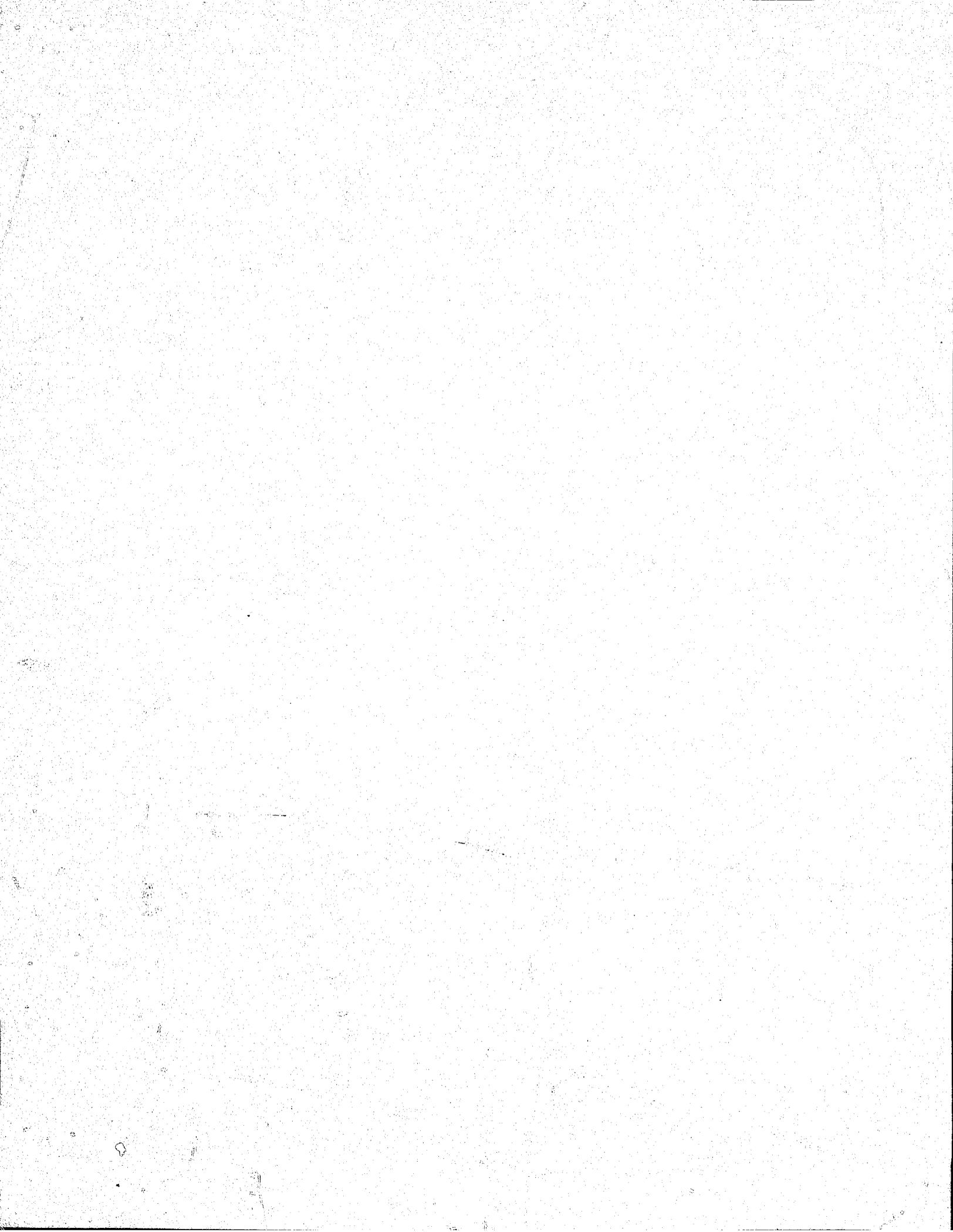
Empirical Charts -- Family Abuse
Child Abuse and Neglect
Percent Alcohol in the Event

Author, Date, Location	Sample	% Alcohol in Event	Alcohol Measure
<u>United States</u>			
Gil, 1973, U.S.	1380 Cases of physical child abuse reported through legal channels in all U.S. states and territories (sexual abuse without evidence of other physical abuse excluded)	13%	Alcohol intoxication of perpetrator determined by social workers
<u>Foreign</u>			
Nau, 1967, Berlin, Germany	105 Child abusers -- 55 observed at forensic-psychiatric clinic and 50 apprehended by local police: 54 men 51 women	44% } 34% 23% }	Under the influence of alcohol Under the influence of alcohol
Scott, 1973, London, England	29 Cases in which father or substitute father charged with murdering his child of less than 5 years of age and imprisoned	0%	Significantly intoxicated with alcohol at the time

Table F-2

Empirical Charts -- Family Abuse
Child Abuse and Neglect
Percent History of Drinking Problems

Author, Date, Location	Sample	% History of Drinking Problems	Alcohol measure
<u>United States</u>			
Young, 1964, U.S.	300 cases of reported parental neglect from child welfare agencies 496 parents	38%	Severe and chronic drinkers whose drinking constituted a primary family problem
Johnson and Morse, 1968, Denver, Co.	85 families with physically abused children reported to child welfare agency: fathers	25%	"Drank to excess" in caseworker reports
	mothers	"a few"	"Drank to excess" in caseworker reports
Andreini and Green, 1975, Anchorage, Alaska	63 families with reported incidents of child neglect, physical abuse and sexual abuse followed up by Anchorage Child Abuse Board	24%	Alcohol abuse noted in family
Gould, 1976, Oakland, CA	Families referred to Children's Trauma Center:		
	74 abusive families in which child(ren) sustained non-accidental injury	16%	On-going stress from problems with alcohol and/or drugs
		7%	Precipitating stress from problems with alcohol
	36 high risk families in which abuse was either impossible to prove or had not yet occurred but factors indicate a high risk of abuse occurring	22%	On-going stress from problems with alcohol and/or drugs
		17%	Precipitating stress from problems with alcohol
<u>Foreign</u>			
Nau, 1967, Berlin, Germany	105 child abusers -- 55 observed at forensic-psychiatric clinic and 50 apprehended by local police:		
	54 men 51 women	57% } 42% } 50%	Alcoholics Alcoholics
Grislain et al, 1968, Paris, France	32 cases of child abuse perpetrated by mother, father, or both, from hospital records	65%	Hospital records of excessive alcohol use
Scott, 1973, London, England	29 cases in which father or substitute father was charged with murdering his child of less than 5 years of age and imprisoned	3%	Mental hospital diagnosis of alcoholism



thus suggesting that parents of abused children have more severe standards of discipline than average parents. Gil cautions that this finding may reflect the predominantly lower socio-economic background of the families in the study.

Although the overall incidence of alcoholic intoxications was rather low in these cases of child abuse, it was associated more heavily with certain constellations of precipitating circumstances than with others. Most notably alcoholic intoxication was associated with physical abuse of children perpetrated by male babysitters and with caretaker quarrels in which the child may have come to the aid of one parent, merely happened to be in the midst of the fight, or the child may have been the object of the quarrel initially (Gil, 1973).

Studies which have focused on drinking histories and drinking problems of parents of abused children have reported a wide range of findings. American studies have, in general, found that less than one-third of abusive parents had histories of drinking problems, while foreign studies have in most cases reported substantially higher figures (See Table F-2).

Additional data on the relationship of alcoholism and child abuse reveals another interesting finding. In a recent study of children from multi-problem families, parental neglect was reported on the part of 23% of the alcoholic parents and 21% of the non-alcoholic parents (Scientific Analysis Corporation, 1976). This small difference was not statistically significant, and was the only one of eight separate "family life problems of children during developmental years" that showed no variance between alcoholic and non-alcoholic parents. In a similar but uncontrolled study of children of alcoholics, research demonstrated that 10% of the children studied reported physical abuse while 64% reported emotional neglect (Booz -Allen and Hamilton, 1974).

Overall, the small number of studies which report findings on alcohol-

involvement, the large range of findings across studies, and the variability across studies in the operational definitions of alcohol-involvement all clearly indicate that the relationship of alcohol and child abuse remains a topic for future research.

C. Child Molesting

1. Incidence and Theory

Determining the true incidence of child molesting is difficult at the present time for many of the same reasons discussed with respect to child abuse and neglect. Most researchers contend that reported abuse comprises a minute fraction of the total number of instances of the behavior, but none are certain what the fraction really is. Furthermore, the only historically reliable sources of reported child molesting are the obviously inadequate criminal court records. Only a few researchers have compiled the available statistics. Weinberg (1955) noted that between 1907 and 1938, the number of detected incest cases was two per million people in the United States and between one and nine per million in Europe. Since the establishment of the National Center on Child Abuse and Neglect in 1974, however, the reporting of instances of abuse and molesting has increased. For example, in Connecticut in fiscal year 1974, 172 cases were reported, compared with 76 in 1973; and in Santa Clara County, California, 180 cases were referred to the Child Sexual Abuse Treatment Program in fiscal year 1974 (15.5/100,000) compared with 36 in 1971 (Giarretto, 1976). Hence it is apparent that the official statistics reflect the degree of concern with the problem more than its actual prevalence.

For the most part research on child molesting has been conducted from a traditional corrective approach. Within this perspective, studies have

attempted to isolate certain factors in the psychological make-up of the offender, coupled with critical factors in his social background, in an effort to "predict," "prevent," and "redeem" child molesters. Research has consisted primarily of either clinical case studies conducted by psychiatrists on their patients or statistical surveys of court offenders directed by criminologists and sociologists. The clinical case studies emphasize psychoanalytic explanations for the offense, while the criminologically-oriented studies present statistics characterizing the prevalence of child molesting (Mohr, 1964).

The problem with operational definitions in studies of child molesting is significant. The variation in legal definitions of child molesting causes considerable confusion in classifying cases of exhibitionism, statutory rape, and child molesting. Often cases come under a general purpose statute of lewd and indecent behavior. This results in different types of offenders being included in many of the samples used in studies of child molesting and makes generalizing from these studies quite difficult (Gebhard et al., 1965).

Research on child molesting utilizes quite different samples from those found in studies of child abuse. Child molesting studies are almost always based on institutionalized samples, i.e., child molesters confined in either mental hospitals or prisons. Such samples are usually relatively small, although generally not as small as those used in studies of child abuse, and, of course, include only reported cases.

It is yet unknown which factors affect reporting of incidents of child molesting, child abuse, and marital violence. The fact that most child molesters and victims are not strangers to each other, but are, in the majority of cases, either relatives or friends whom it would be embarrassing to prosecute may affect the underreporting of child molesting as may the stigma attached to having a child sexually abused, or the fear of bringing a child to court to testify. Also, special court considerations given to juvenile and elderly child molesters bias the kinds of institutionalized samples used in almost all of the studies of child molesting (Mohr, 1964); related to this, the age range of victims included in each study varies. All of these weaknesses in the samples used in studies of child molesting make the validity of drawing generalizations based on this data limited. However, by using control groups and matching for important background variables, many of these problems can be reduced. Indeed, in a few (Glueck, 1956; Gebhard et al., 1965) studies control groups of either the general population or of non-child molesting prison populations have been compared to the sample of child molesters.

Reflecting its criminological research tradition, child molesting literature has had a fairly long history of concern with alcohol-involvement. Even in this research, however, alcohol is only one of numerous factors considered. Explanatory theories of the role of alcohol in child molesting have focused both on the long term effects of continued and excessive drinking resulting in a general social and physical deterioration of the offender and on the short term effects of alcohol as a disinhibitor which results in a lessened awareness of socially defined boundaries between acceptable and unacceptable behavior (Gebhard et al., 1965).

As early as 1939, however, research has shown that drunkenness is often used by child molesters as an excuse for their offenses (Frosh and Bromberg, 1939; McCaghy, 1968). Thus, the offender rather than the researcher offers an explanatory theory of the role of alcohol in the crime. These child molesters claim that drunkenness was the sole cause or reason the offense was committed. Researchers believe that this claim allows the offender to maintain his identity as a normal, non-deviant person, while admitting his crime. One study (Frosh and Bromberg, 1939) noted that child molesters were more prone to using alcohol as an excuse for their behavior than were any of the other types of sex offenders.

In much of the research on child molesting, both the offender's general drinking patterns and his use of alcohol at the time of the offense have received significant attention. These alcohol variables are usually the result of self-reported data and/or police observation (BAC is not used here). However, such terms as "alcoholic," "alcohol present," and "drunk" often appear with little or no information as to the exact meaning of the term.

2. Empirical Data on Alcohol Involvement

Empirical data on alcohol and child molesting, as seen in Tables F-3 and F-4, reveals a considerable degree of variation in reported alcohol-involvement at the time of the offense and in the personal histories of the offenders. Overall figures indicate that 19-49% of offenders were drinking at the time of the offense and that 7-52% were identifiable as alcoholics. Research focused on specific types of offenders (incest offenders, offenders who molest females, homosexual child molesters, etc.) reveals that 29-77% of various types of offenders were drinking at the time of the offense, while 16-73% were labelled as alcoholics.

Although the number of available studies is somewhat limited, comparative data on the level of alcohol-involvement for different types of offenders is presented

Table F-3
 Empirical Studies - Family Abuse
 Child Molesting
 % Alcohol in the Event

Author, Date, Location	Sample	% Alcohol in Event	Alcohol Measure		
Frosh and Bromberg, 1939, New York	120 child molesters convicted or guilty by plea, examined at the psychiatric clinic of a New York court.	32%	Alcohol at the time of the offense.		
	17 incest offenders, convicted or guilty by plea, examined at the psychiatric clinic of a New York court.	29%			
Lebhard et al., 1965, Indiana and California	376 white males imprisoned for 496 sex offenses against children 11 years of age or younger:		Police/self-report of:		
	Total N	N Studied			
	273	220	Heterosexual Offenses	23 } 29	
	30	21	Heterosexual Aggressions	67 } 77	
	70	52	Incest Offenses	31 } 39	
123	91	Homosexual Offenses	25 } 35		
McCaghy, 1968, U.S.	158 males convicted of offenses involving sexual contact with persons under 14 years of age (115 incarcerated and 43 on probation at time of interview)	32	Self report of drinking		
Trisbie, 1969, California	887 adult males convicted or guilty by plea of a sex offense with a minor under the age of 18.	33	Drinking at the time of the offense by police/self-report.		
Rada, 1976, California	203 child molesters, considered mentally disordered sex offenders, confined in state hospital for treatment and who committed sexual offenses against child under 14 years of age.	34 } 10 } 5 }	Drinking at the time of the offense by self-report: Heavily Moderately Lightly		
	Molesters of females	43 } 10 } 4 }		57	
	Molesters of males	25 } 7 } 6 }			38
	Molesters of both males and females	23 } 23 } 8 }		54	
<u>Foreign</u>					
Wilschke, 1965, Germany	276 arrested child molesters	19	Under the influence of alcohol at the time of the offense by witness report of chemical tests		
Virkkunen, 1974, Helsinki, Finland	45 incest offenders examined at a psychiatric clinic of a University Hospital	40	Under the influence of alcohol at the time of the offense (by unspecified report)		

Table F-4

Empirical Studies - Family Abuse
Child Molesting
% History of Drinking Problems

Author, Date, Location	Sample	% History of Drinking Problems	Alcohol Measure	
<u>United States</u>				
Frosh and Bromberg, 1939, New York	120 child molesters convicted or guilty by plea, examined at the psychiatric clinic of a New York court.	16%	Chronic alcoholics	
	17 incest offenders, convicted or guilty by plea, examined at the psychiatric clinic of a New York court.	18%		
Apfelberg et al., 1944, New York	75 male, non-psychotic child molesters examined at psychiatric division of Bellevue Hospital -- victim under 14 years of age	12%	Excessive drinkers	
	10 male, non-psychotic incest offenders examined at psychiatric division of Bellevue Hospital	50%		
Glueck, 1956, New York	178 male sex offenders imprisoned at Sing Sing, of which:	12% } 49%	First figure is severe alcoholism -- marked alcohol-related problems; second figure is moderate alcoholism -- some alcohol-related problems.	
	32 Heterosexual hebephiles (victim pubescent or adolescent through age 16)	19% } 57%		
	53 Heterosexual pedophiles (victim not yet into puberty)	34% } 47%		
	37 Homosexual hebephiles	3% } 44%		
	33 Homosexual pedophiles	9% } 36%		
Ellis and Brancale, 1956, New Jersey	23 Incest offenders	27% } 70%	Alcoholics	
	51 consecutive convicted child molesters seen at New Jersey State Diagnostic Center.	37% } 44%		
11 consecutive convicted incest offenders seen at New Jersey State Diagnostic Center.		73%	Alcoholics	
	Gebhard, et al., 1965, Indiana and California	376 white males imprisoned for sex offenses against children 11 years of age or younger:		"Alcoholics" - habitually use alcohol to such a degree as to interfere seriously with their social relationships and employment or those who drink an average of one fifth of liquor a day even though they maintain their social and economic status.
	Total N	N Studied		
	199	195	Heterosexual offenders	16%
	25	25	Heterosexual aggressors	40%
	56	56	Incest offenders	23%
	96	95	Homosexual offenders	19%
Swanson, 1968, U.S.	25 cases referred by courts for psychiatric evaluation because of a sexual offense against a minor child	28%	Severe alcoholics based on psychiatric diagnosis	
Frisbie, 1969, California	311 adult males convicted or guilty by plea of a sex offense with a minor under the age of 18.	25%	Self-report of alcohol use, meeting research criteria of "problem drinking."	
Henn et al., 1976, St. Louis, Mo.	111 arrested child molesters referred by courts to forensic service for evaluation	7%	Primary diagnosis of alcohol and drug abuse	
Gada, 1976, California	203 child molesters, considered mentally disordered sex offenders, confined in state hospital for treatment and who committed sexual offenses against children under 14 years of age.	33-52%	First figure is percent alcoholics determined by brief MAST (Michigan Alcoholism Screening Test) and second figure is percent alcoholics determined by original MAST.	
	Molesters of Males	25-44%		
	Molesters of Females	38-58%		
	Molesters of both males & females	46-54%		
<u>Foreign</u>				
Wilschke, 1965, Germany	276 arrested child molesters	12%	alcoholics	
Virkkunen, 1974, Helsinki, Finland	45 incest offenders examined at psychiatric clinic of a University hospital	49%	alcoholics by clinic diagnosis based on self-report of daily alcohol use and long periods of drinking continuing for several years.	

in several studies. One study, conducted by Gebhard and associates (Gebhard et al., 1965), differentiates sexual offenders according to the level of physical force involved in the offense, by the age of the victim, and according to the nature of the relationship between offender and victim. Data from this study is presented in more detail in Table F-5A.

With respect to both patterns of alcohol use and presence of alcohol in the particular offense, alcohol-involvement in this study was higher in offenses against children than in those against minors or adults. Considering different types of child molesters, the data effectively demonstrates that heterosexual aggressors, those child molesters that use force or threat, show both a significantly larger percentage of drunken offenders at the time the offense was committed, and a considerably larger proportion of identifiable alcoholics than all other types of child molesters.

Data from the control groups indicates that the proportion of identifiable alcoholics is higher in all four groups of child molesters than in the general population control group. However, in only one group of child molesters, the heterosexual aggressors, does the proportion of labelled alcoholics (40%) greatly exceed the prison control group proportion of alcoholics (18.6%). Thus, although alcoholism is evidenced in disproportionately high numbers of child molesters, it seems to be more characteristic of the prison population in general than of child molesters specifically. The one exception to this general pattern is the higher rate of alcoholism evidenced in the heterosexual aggressor group. However, of the entire group of child molesters, the heterosexual aggressor accounts for only 6% or 7% of the offenders studied.

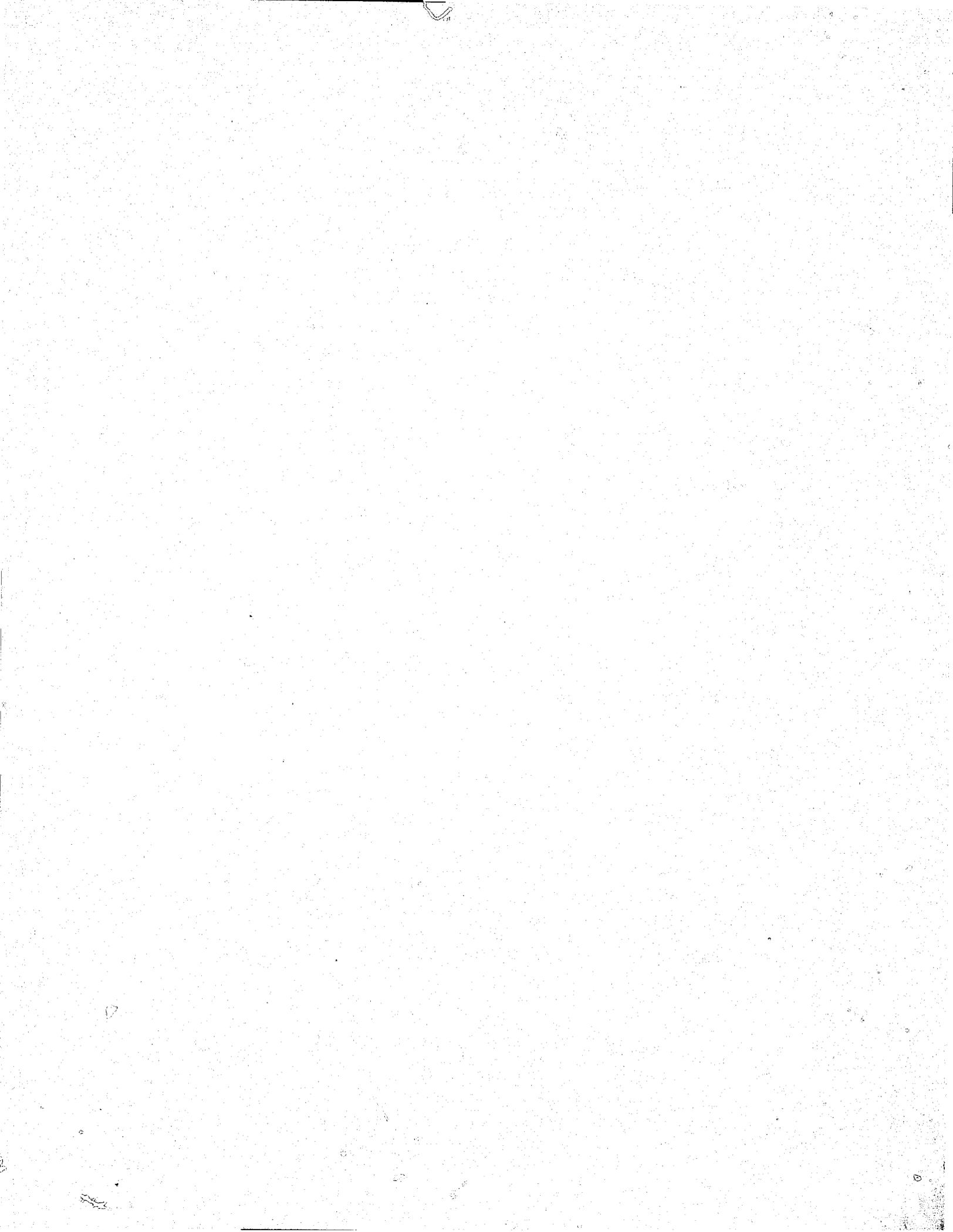


Table F-5A: Alcohol and Sex Offenses (Source: Gebhard et al., 1965)

Groups	Offenses Total N	Alcohol Use in Event			Offender Drunk %	Cases Total N	Patterns of Alcohol Use ¹					
		N Studied	No Alcohol %	Alcohol Present %			N Studied	Abstinent %	Some to		Frequent %	Alcoholic %
									Moderate %	Frequent %		
Control ²	--	--	--	--	--	477	388	15.7	60	17.8	6.4	
Prison ³	--	--	--	--	--	888	729	13.8	41.2	26.3	18.6	
Heterosexual Offenders ⁴ vs.												
Children ⁵	273	220	71.4	5.9	22.7	199	195	15.9	46.7	21	16.4	
Minors ⁶	196	135	82.2	8	8	174	167	18	49.1	25.1	7.8	
Adults ⁷	229	174	82.8	8	9.2	217	211	16.1	49.8	28.0	6.2	
Heterosexual Aggressors ⁸ vs.												
Children	30	21	23.8	9.5	66.7	25	25	8	20	32	40	
Minors	29	24	62.5	12.5	25	27	27	18.5	44.4	25.9	11.1	
Adults	191	137	46	14.6	39.4	140	137	13.1	41.6	29.9	15.3	
Incest Offenders vs.												
Children	70	52	61.5	7.7	30.8	56	56	3.6	44.6	28.6	23.2	
Minors	78	66	75.8	3	21.2	66	66	10.6	50	19.7	19.7	
Adults	25	20	75	5	20	25	24	16.7	54.2	20.8	8.3	
Homosexual Offenders vs.												
Children	123	91	64.8	9.9	25.3	96	95	10.5	51.6	18.9	18.9	
Minors	196	149	83.2	5.4	11.4	136	135	11.8	53.3	20	14.8	
Adults	292	189	75.7	9	15.3	199	191	5.2	62.8	17.8	14.1	

¹Abstinent = 0-2 times a year
 Some to Moderate = 3 times a year to a drink every two days
 Frequent = 1 drink per day up to alcoholism
 Alcoholic = habitual use of alcohol so that it seriously
 interferes with social and employment relationships, or
 equivalent of one-fifth whiskey daily

²Persons never convicted of any crime

³Prison control group consisted of inmates convicted of
non-sex offenses

⁴Offenders = sexual contact without the use of force
 or threat

⁵Children - less than 12 years old

⁶Minors - 12-15 years old

⁷Adults - 16 years and older

⁸Aggressors = sexual conduct accompanied by force
 or threat

Table F-5B: Alcohol and Sex Offenses (Source: Gabhard et al., 1965)

OFFENSE TYPES	Alcohol status at time of offense	Patterns of Alcohol Use				Cases	
		Abstinent	Some to moderate	Frequent	Alcoholic	N Studied	Total N
		%	%	%	%		
Heterosexual offenses vs. Children	No alcohol	28.7	58.6	7.6	5.1	157	233
	Alcohol present	0.0	46.2	23.1	30.8	13	
	Offender drunk	0.0	14.0	30.0	56.0	50	
Minors	No alcohol	32.4	56.8	8.1	2.7	111	196
	Alcohol present	8.3	33.3	58.3	0.0	12	
	Offender drunk	0.0	41.7	50.0	8.3	12	
Adults	No alcohol	25.7	54.9	17.4	2.1	144	229
	Alcohol present	0.0	64.3	28.6	7.1	14	
	Offender drunk	0.0	50.0	31.2	18.8	16	
Heterosexual aggressions vs. Children	No alcohol	(80.0)	(20.0)	(0.0)	(0.0)	(5)	30
	Alcohol present	(0.0)	(0.0)	(50.0)	(50.0)	(2)	
	Offender drunk	0.0	14.3	35.7	50.0	14	
Minors	No alcohol	40.0	53.3	6.7	0.0	15	29
	Alcohol present	(0.0)	(33.3)	(33.3)	(33.3)	(3)	
	Offender drunk	(0.0)	(33.3)	(50.0)	(16.7)	(6)	
Adults	No alcohol	34.9	60.3	4.8	0.0	63	191
	Alcohol present	5.0	55.0	20.0	20.0	20	
	Offender drunk	1.8	18.5	46.3	33.3	54	
Incest offenses vs. Children	No alcohol	6.2	78.1	15.6	0.0	32	70
	Alcohol present	(0.0)	(25.0)	(75.0)	(0.0)	(4)	
	Offender drunk	0.0	6.2	12.5	81.2	16	
Minors	No alcohol	14.0	74.0	10.0	2.0	50	78
	Alcohol present	(0.0)	(50.0)	(50.0)	(0.0)	(2)	
	Offender drunk	0.0	28.6	14.3	57.1	14	
Adults	No alcohol	26.7	66.7	6.7	0.0	15	25
	Alcohol present	(0.0)	(0.0)	(0.0)	(100.0)	(1)	
	Offender drunk	(0.0)	(0.0)	(75.0)	(25.0)	(4)	
Homosexual offenses vs. Children	No alcohol	18.6	78.0	3.4	0.0	59	123
	Alcohol present	(0.0)	(22.2)	(33.3)	(44.4)	(9)	
	Offender drunk	0.0	17.4	26.1	56.5	23	
Minors	No alcohol	19.4	68.5	12.1	0.0	124	196
	Alcohol present	(0.0)	(25.0)	(50.0)	(25.0)	(8)	
	Offender drunk	0.0	0.0	29.4	70.6	17	
Adults	No alcohol	11.2	80.4	7.0	1.4	143	292
	Alcohol present	0.0	52.9	41.2	5.9	17	
	Offender drunk	3.4	34.5	24.1	37.9	29	

See reference for Table F-5A.

Figures in parentheses indicate cell N < 10.

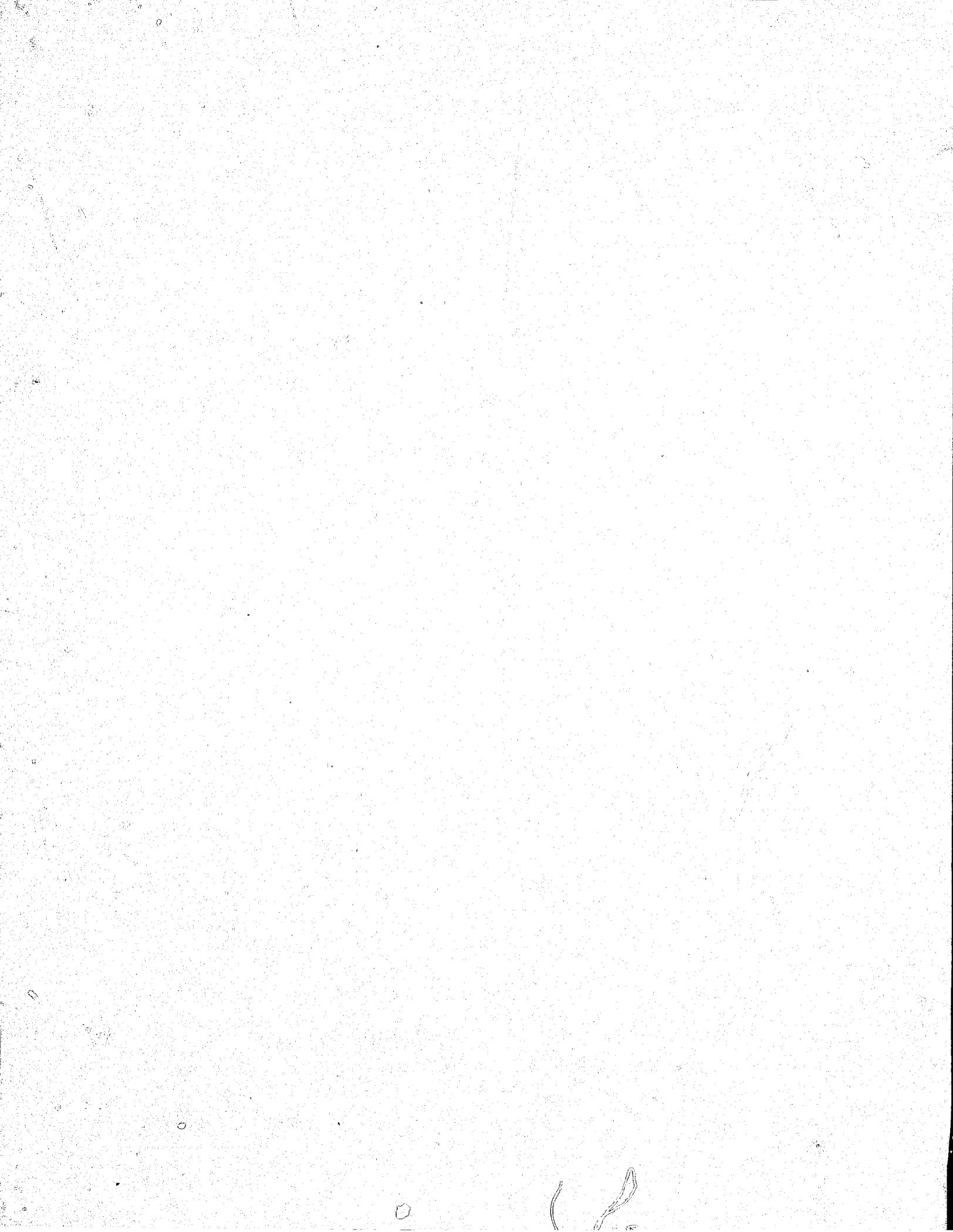


Table F-5B presents data on the interrelationship between child molesting, patterns of alcohol use and drinking at the time of the offense. The data indicates that when considering offenses in which the offender was drunk, one-half or more of these offenses which involved children were committed by alcoholics. This is in contrast with only 19-38% of offenses in which the offender was drunk and the victim was an adult.

A second study presented in Tables F-3 and F-4 which differentiates types of child molesters reveals variation in the level of alcohol-involvement in the offense according to the sex of the child victim (Rada, 1976). In general, alcohol-involvement findings, both at the time of the offense and in the personal histories of the offenders, are higher in this study than in the previous one. Moreover, the patterns of alcohol-involvement according to type of offender are somewhat different in these two studies. Rada (1976) found that both the proportion of offenders who were drinking at the time of the offense and the proportion of offenders identifiable as alcoholics were greater in the case of child molesters who victimized females than for molesters who victimized males. The equivalent figures from the Gebhard et al. study (1965), however, reveal no substantial differences between child molesters according to sex of the child victim. Overall, molesters who victimized females (heterosexual offenders and heterosexual aggressors combined) and those who victimized males (homosexual offenders) show approximately equal proportions of offenders who were drinking at the time of the offense (33% of molesters of females and 35% of molesters of males) and of identifiable alcoholics (19% of molesters for both sexes of victims). Thus, although both studies indicate that alcohol-involvement in child molesting appears to vary by type of offender (e.g., heterosexual offenders as compared to homosexual offenders), alcohol-involvement patterns differ somewhat between these studies.

Several studies in Tables F-3 and F-4 present comparative data on incest offenders and other child molesters (Frosh and Bromberg, 1939; Apfelberg et al., 1944; Glueck, 1956; Ellis and Brancale, 1956; Gebhard et al., 1965). Those studies indicate that in general, incest offenders are characterized by larger proportions both of alcoholics (Table F-4) and of offenders who were drinking at the time of the offense (Table F-3), when compared with other child molesters. It should be noted, however, that almost all of these studies include only a very small number of incest offenders. Thus, findings based on these samples should be interpreted with some degree of caution.

Although the small number of studies which focus on alcohol as a factor in child molesting cannot support broad generalizations about the precise role of alcohol in child molesting, they do provide key theoretical and empirical issues for further study.

D. Marital Violence

1. Incidence and Theory

Marital violence includes a broad range of acts from a slap on the face to homicidal mayhem. In unpublished data from a 1963/64 probability survey in San Francisco (Knupfer, 1967), 12% of 315 husbands and 14% of 327 wives reported that when really angry with their spouse they had at some time tried "to hit or slap him/her"; 11% of the husbands and 17% of the wives had thrown something on such occasions. While these figures are probably underestimates, and exclude information on terminated marriages, it is interesting that at this minimal level of severity, marital violence seems relatively evenly distributed between husbands and wives. Similarly, a recently reported national survey by Gelles et al. found that wives assaulted their husbands as frequently as husbands their wives (New York Times, March 20, 1977, p. E6).

In social statistics and in both popular and scientific literatures, however, the emphasis is solely on what is usually termed "wifebeating". The almost complete inattention to husbandbeating is probably related to several factors.* Husbands usually outweigh and outreach their wives, and are thus likely to come off best where there is an open fight. The cultural prohibition to hitting a woman makes wifebeating especially shocking. Conversely, at least since Chaucer's Wife of Bath tale, beaten husbands have been figures of fun and ridicule, and these cultural attitudes are likely to make husbands especially unlikely to report their humiliation. Lastly, husbands may be more likely than wives to escalate the level of violence when a minimal event occurs. Since there is no literature on husbandbeating, there is of course no information on possible alcohol involvement.**

* On August 19, 1977 the California State Senate passed a bill making it a felony for a woman to beat her husband.

** Along with his numerous cases of imprisonment for "wifewhipping" in which the husband was uniformly reported as ~~intemperate~~, Chipman (1845) recorded one sober woman imprisoned "for whipping her drunken husband."

Historically, wifebeating has not always been against the law. For example, the early Common Law of England permitted a man to inflict any "lawful and reasonable" injury upon his wife, usually for unchastity. The civil law even mandated "severe beating with whips and clubs" for feminine sexual transgressions. In America during the late nineteenth century the trend began to be reversed, and at least Pennsylvania and Maryland prescribed public lashings of men who beat their wives, thus attempting to inhibit the exercise of violence through the administration of even greater violence (Steinmetz and Straus, 1973).

Yet, even today it is abundantly clear that the cases of serious wife-beating which come to public notice are only a small fraction of those which actually occur. Wives often prefer not to notify any one of even serious physical abuse for many reasons, including social embarrassment, the perceived ineffectiveness of governmental involvement, and fear of reprisal. Nonetheless, violence does appear to be a relatively frequent occurrence in many American households. Family fights instigate more police calls than any other type of incident and are the most dangerous (Bard and Zacker, 1971; Parnas, 1967); relatives are the most likely murder victims (see below); and a survey of high school students reveals that one-sixth of their parents had been the victims of physical aggression by the other parent at least once during the previous year (Steinmetz and Straus, 1973).

The most detailed information about the incidence of intrafamilial violence can be extracted from homicide statistics. In separate studies in Philadelphia and Detroit, nearly a quarter of all homicides in each city were perpetrated by one family member upon another, most often by the husband or wife upon the other. The classic Philadelphia analysis undertaken by Wolfgang (1958) upon 1948-1952 data was repeated and supported by an even larger investigation by Boudouris (1971) on data from 1926 to 1968 (see Chapter Four, Alcohol and Crime).

Similar results are uncovered from analysis of aggravated assault data (Pittman and Handy, 1964), despite the fact that the criminal charges are often dropped by the complaining spouse (Whitehurst, 1971). Other quasi-empirical information on marital violence includes a President's Commission findings that 16.26% of all Americans condone physical violence between family members; and that at least 37% of a sample of female divorce applicants spontaneously mentioned overt violence as a precipitating factor in their decision to seek dissolution of the marriage (Levinger, 1966).

These fragmented bits of data cannot as of yet provide sufficient information on the incidence of marital violence in this country. So little research has focussed specifically on physical aggression between husbands and wives that the frequency with which this type of violence occurs is still unknown.

Although research in this area has been scant, statements strongly implicating alcohol and alcoholism in wifebeating have been numerous. Historically, intoxication has been widely perceived as playing an important role in wifebeating. A discussion of wifebeating in colonial Canada noted several case studies in which the assailant was quite inebriated at the time of the act (Gray, 1972); and the nineteenth century American temperance movement frequently pointed to an association with inebriety as a compelling argument in support of abstinence or prohibition (Levine, 1977). These temperance sentiments are still being reflected today. For example, a U.S. senator recently stated, "I don't know of anything that has caused more wifebeating than alcoholism."*

* The Alcoholism Report, October 14, 1977, Vol. 5 , No. 24.

2. Existing Empirical Data on Alcohol-Involvement

Despite historical and popular acceptance of alcohol's role in marital violence, modern day empirical evidence to support such claims is quite limited. The alcohol literature most closely concerned with wife beating concerns the dynamics of women's response to their alcoholic husbands. Some years ago there was emphasis in the research literature on the wife's psychodynamics as partly responsible for the husband's condition. More recently, comprehensive and systematic research conducted by Jackson (1954) and others has found that wives' behaviors may be better conceptualized as both responses to and compensations for the husbands' alcoholism. She found that an interactional, sequential response pattern by wives of alcoholics emerged quite regularly; and her thesis has been supported by subsequent investigators (Ablon, 1976). One such research team contacted wives of alcoholics who had at one time sought help for their family problems from an alcohol-related social service agency. When the woman reported her husband to be violent or aggressive, the typical response pattern she adopted was either "withdrawal within marriage" (quarrelling yields feelings of anger and helplessness, and ultimately avoidance) or attack (separation sought, lock husband out, feign drunkenness); or both (James and Goldman, 1971).

Research focussed specifically on the use of alcohol in situations involving physical aggression between husbands and wives reveals widely differing reports of the extent to which alcohol is present. In the four studies reported in Table F-6, alcohol was present in as few as 6% to as many as 50% of reported instances of marital violence. Moreover, as seen in Table F-7, only one study (Gayford, 1975a) reports data on the proportion of violent husbands with histories of problem drinking or alcoholism (52-74%).

Table F-6

Empirical Studies -- Family Abuse
Marital Violence
Percent Alcohol in the Event

Author, Date, Location	Sample	% Alcohol in Event	Alcohol Measure
<u>United States</u>			
Gelles, 1972, Portsmouth, N.H.	44 families in which inter-family violence occurred -- 20 reported to police and 20 reported to social agency 4 from control groups	48%	Drinking accompanied violence by self-report and spouse report
Bard and Zacker, 1974, N.Y.	252 police calls involving marital disputes in which complainant alleged an assault had taken place.	6%	Non-complaining spouses had been drinking by complainant's report.
	330 police calls involving marital disputes in which investigating officer judged an assault had taken place	21%	Non-complaining spouses had been drinking by police reports
<u>Foreign</u>			
Gayford, 1975, London, England	100 battered wives who sustained physical abuse perpetrated by husband and sought assistance at Women's Aid Hostel and other service organizations	44%	Husband drunk by wife report
Gerson, 1976, Ontario, Canada	183 police files of marital assault	50%	Police report of drinking

Table F-7

Empirical Studies -- Family Abuse
Marital Violence
Percent History of Drinking Problems

Author, Date, Location	Sample	% Alcohol in Event	Alcohol Measure
<u>Foreign</u>			
Gayford, 1975, London, England	100 battered wives who sustained physical abuse perpetrated by husband and sought assistance at Women's Aid Hostel and other service organizations	52%	Husbands drunk frequently by wife report
		22%	Additional cases of husbands having episodes of heavy drinking accompanied by drunkenness by wife report



Despite this limited number of studies, however, several interesting observations can be made concerning the dynamics of the relationship between alcohol and marital violence. For example, data from one U.S. study (Bard and Zacker, 1974), based on calls to a local police department requesting assistance in domestic disturbances, yields an interesting comparison between information on alcohol-involvement from the complaining party, the non-complaining party, and the police marital relations officer answering the call.

The police personnel responded to 1388 such calls over a 22 month period. Overall, in the officers' view, the complainant was noted as having used alcohol (but not necessarily having been intoxicated) in 26% of the cases. The person against whom the complaint was made was reported by officers to have been drinking in 30% of the cases. In 10% of the cases the complaining party alleged that the complainant was drunk. Fewer than half of these were corroborated by police. Alcohol was perceived by officers to be primary in the origins of the disputes in only 14% of the cases.

Of the total calls received by police, 252 were cases in which the complainant alleged a physical assault. In only 6% of the cases did the complainant allege that the second party was both drunk and assaultive.

It is important to note that in the 330 cases in which the officers thought that an assault had taken place, it was their impression that the noncomplaining party had been drinking in 21% of the cases. However, in the 627 cases officers judged to be non-assaultive, the noncomplaining party was alleged to have been drinking in 40% of the cases.

This data clearly points out the rather large discrepancy between the officers' and the involved parties' impressions of alcohol involvement in family disputes.

In a second U.S. study (Gelles, 1972), the role of alcohol as an excuse for violent behavior between husbands and wives was documented. Drinking was reported by one or another of the spouses in 48% of the instances of marital violence. Gelles observed that wives explanations of their husbands' violence often centered on his drinking. These women reported that their husbands became violent only when drinking, thus placing the blame for the violence on the husbands' drinking. Some wives went on to state that if their husbands did not drink, they would not be violent. Others even felt that drinking was the husband's major problem rather than his violence. Gelles also noted that drinking may act as a trigger mechanism which initiates marital violence. He suggested that quarrels originating over one spouse's belief that the other drinks too much can eventually result in an escalation of the fight to the level of physical aggression.

The role of drinking as an excuse for marital violence was also noted in a recent Scottish study of wifebeating (Dobash, 1977). In this study, although many of the wifebeaters had had a "drink or two" they were not considered to be under the influence of alcohol. Dobash concluded that alcohol was not a significant factor in wifebeating because it was such a common practice for a large percentage of the general population to make a daily social visit to the pub. She went on to state that:

"The myth about wifebeating and alcohol is very strong and it provides both the husband and the wife with an excuse/reason which ... makes both the act of beating up one's wife and the fact of being beaten by one's husband somehow less personal and horrific.

The relationship between alcohol and wifebeating is not direct but complex: it seems to be less related to the actual state of physiological and psychological incapacity than it is to the function of rationale or excuse." (Dobash, 1977)

Another empirical survey of interest not included in Tables T-6 or T-7 was undertaken by Levinger in greater Cleveland. Six hundred couples who sought divorces were required to submit to questioning by marriage counselors, and the responses were then coded. He found that 26% of the wives complained of drinking on the part of their spouse. In the same study, 37% of the women reported that they had been victims of physical abuse (Table F-8). Unfortunately, the co-variation of drinking and abuse variables was not reported.

Table F-8

Marital Complaints Among 600 Couples Applying for Divorce
Classified by Sex and by Social Position of Respondents

(Levinger, 1966)

Proportion of Complaints by Respondent Groups

<u>Complaint</u>	<u>Wives</u> <u>(total)</u>	<u>Husbands</u> <u>(total)</u>	<u>Social Position of:</u>			
			<u>Wives</u>		<u>Husbands</u>	
			<u>Middle</u>	<u>Lower</u>	<u>Middle</u>	<u>Lower</u>
Drinking	.265	.050	.143	.294	.048	.051
Physical Abuse	.368	.033	.228	.401	.029	.035

This study also confirms the popular notions that lower status individuals are both more likely to drink and to be physically abusive than are high status persons (Levinger, 1966). Again, however, the sample upon which those conclusions are based was derived from people who contacted a social service agency, and thereby excludes most higher income persons. Finally, a typical example of most marital violence/drinking literature is Snell, Rosenwald, and Robey's report of the complaints of 12 women who took their mates to court for wifebeating. "Most" of the men were alleged to be "heavy drinkers" (Snell et al., 1964).

The fact that the results of the studies discussed above indicate conflicting data on the relationship between drinking and abuse is neither

surprising nor discouraging. Each study looked at different types of subjects defined on a marital violence continuum. One would expect that women who sought refuge in a London hostel might have different experiences from those who called the police for help in an American city. Furthermore, the alcohol measures are not comparable. Assessment of alcohol involvement by trained police personnel is not equivalent to self-reported alcohol involvement drawn from comments by the battered women themselves. Since none of the research includes a broad, general population sample or objectively replicable alcohol measures, the conclusions drawn must necessarily be illustrative and tentative.

3. Some New Data

Some new information on the association of alcohol and belligerence in the family is available from a nationwide survey of drug use among young males. In a nationwide probability survey of 2,510 males aged 20-30 conducted in 1974/75, with an 84% response rate (O'Donnell et al., 1976), respondents were asked if their use of any drugs, including alcohol, had caused them to have problems with a wife or girlfriend, their parents, and friends or other people they lived with. Nineteen percent of all men in this study reported having had some alcohol-related problem with a wife or girlfriend, 18% with parents, and 8% with friends or housemates. These percentages were at least three times the prevalences of these problems reported for other drugs. Even comparing only users of each drug, only heroin users reported relationship problems due to their heroin use as commonly as alcohol users for alcohol use.

Respondents were then asked, for the three types of relationships taken together, when problems with alcohol had first occurred, and what was "the most serious problem you have had with other people because of your use" of alcohol. While this question does not refer only to family relationships, it appears likely from the figures above that family or family-like relationships account for the bulk of the reported problems. Responses to this open-ended question were coded in the following scheme:

Table F-9 Coding Scheme

	<u>As % of total sample</u>	<u>As % of those with interpersonal alc. problems</u>
Beating, murder, severe violence behavior while drinking	.2	.6
Belligerence--clearly belligerent (Not severely violent) behavior while drinking (if Respondent in fight while using drug use this code regardless of who was initially belligerent)	5.7	19.8
Disagreements over behavior while drinking (can include behavior over an extended period of time) "wife used to be unhappy about the way I acted when I was drinking"	6.0	20.9
Disagreements over fact or extent of use "Parent's didn't approve of my drinking"	12.3	43.0
Other or non-specified disagreements	3.5	12.2
Other problems not designated	1.0	3.5
No codable information, no inter- personal problems	71.5	--

It should be noted initially that only about 40% of alcohol-related relationship problems clearly involved behavior while drinking (first three categories), as opposed to disagreement over the fact of drinking or other disagreements. Belligerence was coded as involved in about half of these, but only in a tiny minority of cases was serious violence reported and coded (first category). For the remainder of this discussion, the first two categories will be treated together, as belligerent behavior.

Table F-10

Relationship Problems Involving Alcohol by Education

		<u>"Heaviest users"</u>	<u>All others</u>	<u>Total</u>
<u>Total sample</u>		9.3	3.7	5.8
<u>Relationship problems involving alcohol and belligerence</u>	(N)	(933)	(1577)	(2510)
<u>Some college education</u>		8.2	3.0	4.8
<u>Relationship problems involving alcohol and belligerence</u>	(N)	(414)	(769)	(1183)
<u>High school or less education</u>		10.2	4.5	6.6
<u>Relationship problems involving alcohol and belligerence</u>	(N)	(519)	(808)	(1327)

The first column of Table F-10 compares the rate of relationship problems involving belligerence in the 3/8 of the sample defined as "heaviest users" of alcohol, i.e., having used alcohol at least 1000 times, and sometimes in large amounts (O'Donnell et al., 1976, p. 25). The heavier drinking group is 2-1/2 times as likely as others to report alcohol/belligerence relationship problems, but these problems are by no means confined to this group--the remaining 5/8 of the sample reports 2/5 of the total number of alcohol/belligerence relationship problems. As a rough measure of social class or status, we used respondents' education dichotomized by whether the respondent had ever attended college. Alcohol/belligerence problems are a little more prevalent among the non-college males. Heavy drinking and low education seem to be slightly additive in their association with relationship problems, with heavier drinking showing a much stronger effect. The relationship between heavy drinking and belligerence is not explained away by social class.

Variations in the rate of alcohol/belligerence relationship problems can reflect a number of underlying patterns. For instance, the variations may simply reflect a propensity to aggressive behavior, whether or not alcohol is involved, or they may reflect a propensity specifically after drinking; they may reflect a propensity to alcohol-related aggression against all comers, or a propensity specifically to hurt those in intimate relations; they may uniformly reflect a pattern of general disagreements over drinking behavior in relationships, or reflect special propensities to aggression when a disagreement occurs. In stereotyped terms, we can ask whether the drunken wifebeater commits assaults whether drunk or sober; whether when drunk he only hurts those he loves or commits assaults impartially; whether the frequency of drunken wifebeating depends directly on the frequency of drunken marital quarrels, or on some special propensity to violence. These questions do not exhaust the possible relations between alcohol, violence, and intimate relationships, but answers to them will help us understand the possible roles of alcohol in the occurrence of belligerence in relationships. Some evidence on these questions may be gathered from the present data.

a. Belligerence in Domestic Disagreements Over Drinking Behavior

As may be seen from Table F-9, the most common single category of alcohol relationship problems is disagreements over the fact or extent of use. This category presumably partly reflects that most drinkers have passed through a period of illegal use before reaching majority--the median age of first use "when your mother and father were not around" in this sample was 15. Excluding this category, the first three categories of Table F-9, taken together, may be presumed to provide a relatively direct indicator of interpersonal alcohol-related problems where behavior while drinking--rather than the issue of

drinking per se--becomes an issue in the relationship. The proportion reporting belligerent or violent behavior in their most serious alcohol-related interpersonal problem among those in these first three categories then becomes an indicator of the extent to which belligerent behavior occurs in post-drinking domestic disagreements. Table F-11 shows that, while less educated men report somewhat more belligerence in alcohol-related disagreements than those with some college education, heavy drinkers are not more likely to report belligerence. The surplus of belligerent interpersonal problems among heavier drinkers seen in Table F-10 then, does not seem to reflect more belligerence on their part in alcohol-related disagreements, but rather a greater rate of alcohol-related disagreements irrespective of belligerence.

Table F-11

Proportion Belligerent Among Interpersonal Disagreements

	<u>Heaviest Users</u>	<u>All Others</u>	<u>Total</u>
<u>Total</u>			
% belligerent	49	49	49
(N) alc.-related disagreements	(177)	(119)	(296)
<u>Some College Education</u>			
% belligerent	44	47	45
(N) alc.-related disagreements	(77)	(49)	(126)
<u>No College</u>			
% belligerent	53	51	52
(N) alc.-related disagreements	(100)	(70)	(170)

b. Generalized Propensity to Fight

The available indicator in this area is quite weak, indicating attitudes rather than behavior. In the context of a variety of acts which might be viewed as immoral or illegal, respondents were asked "How bad is it if a person gets into fights?" and 2.4% checked "all right or good," 19.6% checked

"a little bit bad," 40.9% replied "pretty bad," and 37.1% replied "very bad." Heavier drinkers and less educated men seemed slightly more likely to respond that getting into fights was no worse than "a little bit bad," but even in cross-tabulation the range of proportions was only 19-27% (Table F-12A). Those more accepting of fighting in general seemed only slightly more likely to be involved in belligerent alcohol relationship problems (Table F-12B). Furthermore, looking within the group of those reporting alcohol relationship problems involving their behavior while drinking (first three lines of Table F-9), belligerence in the most serious occurrence was not significantly more likely among those accepting fights as not too bad, than among the rest of the sample (Table F-12C).

Table F-12

Propensity to Fight

	<u>Heaviest Alcohol Users</u>		<u>All Others</u>		<u>Total</u>	
	%	N	%	N	%	N
A. % reporting getting into fights "all right" or "a little bit bad":						
Total	25	933	20	1577	22	2510
Some College	21	414	19	769	20	1183
No College	27	519	22	808	24	1327
B. % reporting alcohol/belligerence relationship problem, for those accepting and not accepting fights:						
Fighting Not Too Bad	.10	230	5	320	7	550
Fighting Pretty Bad	9	698	3	1252	5	1950
C. % reporting alcohol/belligerence relationship problem, among those reporting drinking behavior problem, for those accepting and not accepting fights:						
Fighting Not Too Bad	55	42	46	35	51	77
Fighting Pretty Bad	47	135	51	84	49	219

At least as measured by the respondent's generalized acceptance of fighting, then, a generalized propensity to fighting does not appear to play a substantial role in alcohol-related intimate belligerence, either in an absolute sense of affecting the rate of occurrence or in terms of whether arguments when they occur are more likely to turn belligerent.

c. Alcohol-Related Fights in General

Respondents were asked whether they had ever gotten into a physical fight as a result of using alcohol. Twenty-seven percent responded yes--far more than responded affirmatively for any other drug, even comparing users of each drug (O'Donnell et al., 1976, p. 79). Of course, it must be kept in mind that alcohol-related belligerence in intimate relations will often also be reported by the respondent as an alcohol-related physical fight.

Alcohol-related fights are about two and a half times as likely to occur to heavier drinkers than to others, and about one and a half times as likely to occur to those with less than a college education. These relations are roughly additive (Table F-13A).

Table F-13A

Alcohol-Related Fights

<u>A.</u> <u>Physical Fights Due</u> <u>to Drinking:</u>	<u>"Heaviest Users"</u>	<u>All Others</u>	<u>Total</u>
Total Sample:			
%	43	18	27
N	(933)	(1577)	(2510)
Some College:			
%	34	14	21
N	(414)	(769)	(1183)
No College:			
%	51	22	33
N	(519)	(808)	(1327)

Table F-13B

B.
Ratio: alcohol/belligerence relationship problems: (Table F-10/ Table F-13A)
fights due to drinking

	<u>"Heaviest Users"</u>	<u>All Others</u>	<u>Total</u>
Total	.22	.21	.21
Some College	.24	.21	.23
No College	.20	.20	.20

We can compute a ratio between the percentages in Tables F-10 and Table F-13A as a rough indicator of the relation of belligerence in alcohol-related intimate disagreements to alcohol-related fights in general (Table F-13B). There appears to be little variation in this ratio. Thus the variations by drinking behavior and education in alcohol-related intimate belligerence seen in Table F-5 may be tentatively regarded as a relatively direct visitation into intimate relations of general tendencies to alcohol-related belligerence.

As might be anticipated, alcohol-related intimate belligerence is strongly related to physical fighting due to drinking. The relationship is not affected by heavy drinking, but may be marginally less strong among the less educated (Table F-14A). Considering the proportion of belligerence among domestic disagreements over drinking behavior (Table F-14B), those with alcohol-related fights, as expected, report belligerence.

Table F-14

Alcohol-Related Fights by EducationTable F-14A

A.		<u>Heaviest Users</u>	<u>All Others</u>	<u>Total</u>
<u>Some College:</u>				
	<u>Fights due to alcohol:</u>	21	18	20
	% alcohol/belligerence problems in relationship	N (140)	(106)	(246)
	<u>No fights:</u>	2	1	1
	% alc./bellig.	N (274)	(663)	(937)
<u>No College:</u>				
	<u>Fights:</u>	17	15	16
	% alc./bellig.	N (263)	(175)	(439)
	<u>No fights:</u>	3	2	2
	% alc./bellig.	N (256)	(632)	(888)
<u>Total:</u>				
	<u>Fights:</u>	19	16	18
	% alc./bellig.	N (403)	(282)	(685)
	<u>No fights:</u>	2	1	1
	% alc./bellig.	N (530)	(1295)	(1825)

Table F-14B

Base (N) is number with alcohol-involved interpersonal disagreements over behavior while drinking.

B.

<u>Some College:</u>		<u>Heaviest Users</u>	<u>All Others</u>	<u>Total</u>
<u>Fights due to alcohol:</u>		59	70	63
<u>% alc./bellig. problems</u>	N	(49)	(27)	(76)
<u>in relationship</u>				
<u>No fights:</u>		18	18	18
<u>% alc./bellig.</u>	N	(28)	(22)	(50)
<u>No College:</u>				
<u>Fights:</u>		57	62	59
<u>% alc./bellig.</u>	N	(81)	(42)	(123)
<u>No fights:</u>		37	36	36
<u>% alc./bellig.</u>	N	(19)	(28)	(47)
<u>Total:</u>				
<u>Fights:</u>		58	65	60
<u>% alc./bellig.</u>	N	(130)	(69)	(199)
<u>No fights:</u>		18	28	27
<u>% alc./bellig.</u>	N	(47)	(50)	(97)

Although the numbers are small, the relationship appears to be attenuated among the less educated, and heavy drinkers who fight seem to report, if anything, less belligerence than others in their interpersonal disagreements over drinking behavior.

d. Conclusions

The overall picture which emerges from these tables suggests some unexpected relationships between alcohol and family violence. An overall propensity to fighting, at least as measured by a normative item, appears to

have little relation in this sample of young men either to relatively heavy drinking or to alcohol-related belligerence in intimate relationships. While there is a moderate relationship between relative acceptance of fighting and physical fights as a result of drinking ($\gamma = .27$), physical fights as a result of drinking show patterns of relatively strong relationships with heavy drinking and with lower educational level which are quite different from the lack of relationships for acceptance of fighting. Concomitantly, a generalized acceptance of fighting is associated only weakly, if at all, with belligerence in interpersonal disagreements over drinking.

On the other hand, belligerence in interpersonal disagreements over drinking is strongly related to, and behaves similarly to, the general measure of physical fighting as a result of drinking. It is strongly associated with heavy drinking and somewhat more weakly associated with low education. Belligerence in interpersonal disagreements over drinking also behaves, to some extent, similarly to alcohol-related disagreements over drinking, which are strongly related to heavy drinking but not at all to education level (not shown). Thus while belligerence in interpersonal disagreements over drinking is more common among heavy drinkers, this seems more a function of their greater interpersonal friction over drinking than of any special propensity to belligerence. Analogously, alcohol-related fights may be more common in heavy drinkers simply because alcohol is more likely to be present in any occasion in their life rather than as a reflection of a special propensity for fighting. This finding supports Gelles' notion that beaten wives often feel that their spouse's drinking is a greater problem than is his assaultiveness (Gelles, 1972).

E. Violence by Children

Almost nothing is known of the possible involvement of alcohol in intrafamily violence where the child is defined as the aggressor. Such cases may be especially likely to involve alcohol use or problems on the part of the victim. Thus Corder et al. (1976) compared a sample of ten adolescents who committed parricide with ten who killed close relatives or friends, and ten who murdered strangers. Some factors apparently correlated to child parricide include fathers having abused the mothers of the child and the father being physically or emotionally absent. With respect to alcohol, only one of the ten parricidants was drinking at the time of the offense (compared with five of the ten stranger-murders); but six of the ten had an alcoholic parent. In fact, all six of the fathers who were murdered by their children were labelled alcoholics and had been severely abusive to both their wives and the child.

F. Conclusion

In the final analysis the areas of child abuse and neglect and marital violence must be viewed as emerging research disciplines. These areas, along with that of child molesting, offer little systematic empirical data on alcohol-involvement. Studies within all of these fields differ greatly in both the types of samples that form the basis of research in this area, as well as in the operational definitions of alcohol-involvement they employ. Therefore, assessment of the role of alcohol in these specific family problems will depend on new and more rigorously collected and analyzed data.

Any research strategy that attempts to yield detailed findings about alcohol and family abuse must address three threshold issues. Initially, the true nature and extent of the event needs to be determined from unbiased sample populations. The best means available to secure this information is the

victimization survey (see Crime section). Skilled interviewers, perhaps as part of the National Crime Panel studies, could draw from even reluctant women and children frequency and severity of physical abuse by their spouses and parents. Several well-worded alcohol involvement inquiries might then suggest at least the extent of the association between the two events. More sophisticated causal analysis would entail longitudinal studies of the women and children who were victims of physical assault by their spouses and parents. Establishing the role of alcohol in family abuse depends on detailed analyses of how frequently intoxication (on the part of both the assailant and the victim) precedes violent behavior, and what peculiar characteristics repeatedly differentiate the nonviolent from the violent drinking events. By so doing the various situational hypotheses could be tested and possible preventive measures distilled; and the typical spousal and child response patterns might be predictive of subsequent violence and suggestive of the need for professional psycho-social involvement. Finally wherever possible, scientific measures of alcohol incidence should be employed. If police are involved in the data gathering machinery, blood, breath, or urine tests might be obtainable. If not, comprehensive interrogation of the subject about alcohol presence and degree in both the event in question and the history of the parties must be undertaken and systematically coded. When these processes are performed and the data therefrom is analyzed, perhaps it will be possible to discover the role of alcohol in "America's most hushed-up crimes" (Gibbon, 1972).

BIBLIOGRAPHY

Family Abuse

Ablon, Joan

1976 "Family structure and behavior in alcoholism: A review of the literature." In B. Kissin and H. Begleiter, eds., The Biology of Alcoholism, Vol. 4, New York: Plenum Press.

Adelson, Lester

1972 "The battering child." Journal of the American Medical Association, Vol. 222, No. 2, pp. 159-161.

Andreini, Milli and Green, Shelia

1975 "Statistical Description of Cases Followed by the Anchorage Child Abuse Board, Inc., October 1972 - March 1975." (Xerox), Anchorage, Alaska.

Apfelberg, Benjamin; Sugar, Carl; Pfeffer, Arnold Z.

1944 "A psychiatric study of 250 sex offenders." American Journal of Psychiatry, 100(May, 1944), pp. 762-770.

Bard, Morton and Zacker, Joseph

1971 "The prevention of family violence: Dilemmas of community intervention." Journal of Marriage and the Family, Vol 32, No. 4, pp. 677-682.

Bard, Morton and Zacker, Joseph

1974 "Assultiveness and alcohol use in family disputes: Police perceptions." Criminology, Vol 12, No. 3, pp. 281-293.

Blane, H.T.

1977 "Integrated Critical Review of Literature on Youth and Alcohol." Unpublished draft prepared for H.E.W.

Booz-Allen and Hamilton, Inc.

1974 "An Assessment of the Needs of and Resources for Children of Alcoholic Parents." Report presented to NIAAA, Washington, D.C.

Boudouris, James

1971 "Homicide and the family." Journal of Marriage and the Family, Vol. 33, No. 4, pp. 667-676.

Chipman, Samuel

1845 "The Temperance Lecturer: Being Facts Gathered from a Personal Examination of all the Jails and Poor-Houses of the State of New York Showing the Effects of Intoxicating Drinks in Producing Taxes, Pauperism and Crime." Albany, New York.

Chafetz, M.E.; Blane, H.T. and Hill, M.J.

1971 "Children of alcoholics: Observations in a child guidance clinic." Quarterly Journal of Studies on Alcohol, Vol 32, No. 3, pp. 687-698.

Corder, Billie F.; Ball, Brenda C.; Haizlip, Thomas M.; Rollins, Robert and Beaumont, Ralph

1976 "Adolescent parricide: A comparison with other adolescent murder." American Journal of Psychiatry, Vol. 133, No. 8, pp. 957-961.

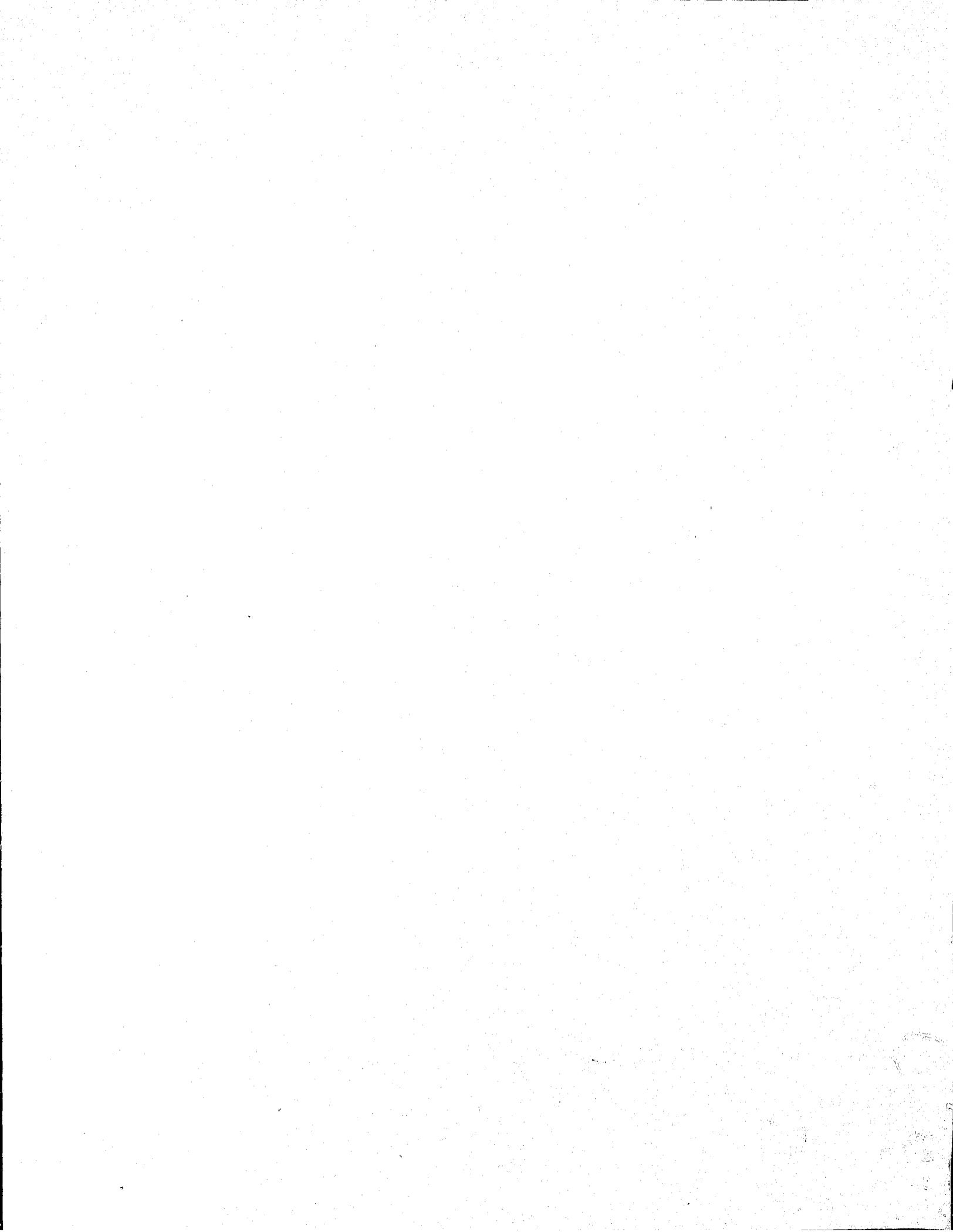
- Cork, R.M.
1969 The Forgotten Children. Toronto: Addiction Research Foundation.
- DeFrancis, Vincent
1969 Protecting the Child Victim from Sex Crimes Committed by Adults.
Denver: American Humane Association, Children's Division.
- Dobash, R. Emerson
1977 Personal Communication.
- Dobash, R.P. and Dobash, R.E.
1976 The Importance of Historical and Contemporary Contexts in Understanding Marital Violence. Paper presented at the 71st Annual Meeting of the American Sociology Association, Sept. 2, New York, New York.
- Edwards, P.; Harvey, C. and Whitehead, P.C.
1973 "Wives of alcoholics: A critical review and analysis." Journal of Studies on Alcohol, Vol 34, No. 1, pp. 112-132.
- Ellis, Albert and Brancale, Ralph
1956 The Psychology of Sex Offenders. Springfield, Illinois: Thomas.
- Elmer, Elizabeth; Girdany, Bertram R.; McHenry, Thomas and Reinhart, John B.
1967 Children in Jeopardy. Pittsburgh: University of Pittsburgh Press.
- Fontana, Vincent J.
1973 Somewhere a Child is Crying. New York, New York: MacMillan.
- Friedman, Robert M.
1976 "Child abuse: A review of the psychosocial research." In Herner and Co., Four Perspectives on the Status of Child Abuse and Neglect Research, prepared for the National Center on Child Abuse and Neglect, U.S. Department of Commerce, report number PB-250 852, Washington, D.C.
- Frosh, Jack and Bromberg, Walter
1939 "The Sex Offender -- A Psychiatric Study." American Journal of Orthopsychiatry, Vol. IX, No. 4 (October, 1939), pp. 761-776.
- Gayford, J.J.
1975a "Wife battering: A preliminary survey of 100 cases." British Medical Journal, Vol. 1, Jan. 25, pp. 194-197.
- Gayford, J.J.
1975b "Battered wives." Medicine, Science and the Law, Vol. 15, No. 4, pp. 237-245.
- Gebhard, Paul H., et al.
1965 Sex Offenders. New York: Harper and Row
- Gelles, Richard J.
1972 The Violent Home. Beverly Hills: Sage.
- Gerson, Lewis
1976 Drug Related Problems in Hamilton-Wentworth. Hamilton, Ontario: Department of Clinical Epidemiology and Bio-Statistics, McMaster University.
- Giaretto, Henry
1976 "Humanistic treatment of father-daughter incest." In Ray E. Helfer and C. Henry Kempe, eds., Child Abuse and Neglect: The Family and the Community. Cambridge, Mass.: Ballinger.

- Gil, David G.
1968 Nationwide Survey of Legally Reported Physical Abuse of Children. Waltham, Mass.: Florence Heller Graduate School for Advanced Studies in Social Welfare, Brandeis University.
- Gil, David G.
1973 Violence Against Children. Cambridge: Harvard University Press.
- Gil, David G. and Noble, John H.
1967 "Public Knowledge, Attitudes and Opinions about Physical Child Abuse in the U.S." Papers in Social Welfare, No. 14, Waltham, Mass.: Florence Heller Graduate School for Advanced Studies in Social Welfare, Brandeis University.
- Glueck, Bernard C., Jr.
1956 Final Report, Research Project for the Study and Treatment of Persons Convicted of Crimes Involving Sexual Aberrations, June 1952 to June 1955. New York: State Department of Hygiene.
- Goode, William J.
1971 "Force and violence in the family." Journal of Marriage and the Family, Vol. 33, No. 4, pp. 624-636.
- Goodwin, D.W.; Schulsinger, F.; Møller, N.; Hermansen, L.; Winokur, G. and Guze, S.E.
1974 "Drinking problems in adopted and nonadopted sons of alcoholics." Archives of General Psychiatry, Vol. 31, pp. 164-169.
- Gould, Joanna R.
1976 "Client Profile: Children's Trauma Center." Report for State Maternal and Child Health Contract No. 74-50733. Oakland, CA: Children's Trauma Center.
- Gray, James H.
1972 Booze: The Impact of Whiskey on the Prairie West. Toronto: MacMillan of Canada.
- Gibbon, August
1972 "The war of the spouses: America's most hushed-up crimes." National Observer, March 11.
- Grislain, J.R.; Mainard, R. and DeBerranger, P.
1968 "Les sevices commis sur les enfants: Problèmes sociaux et juridiques." (Child abuse: Social and legal problems), Annales Pediat. (Sem. Hôp, Paris), Vol. 15, pp. 440-448.
- Griswold, B. and Billingsley, A.
1967 "Personality and Social Characteristics of Low-Income Mothers Who Neglect or Abuse Their Children." (unpublished manuscript).
- Helfer, Ray E.
1976 "Medical Aspects of Child Abuse and Neglect: A Review of the Research Literature." In Herner and Co., Four Perspectives on the Status Child Abuse and Neglect Research, prepared for the National Center on Child Abuse and Neglect, U.S. Department of Commerce, report number PB 250 852, Washington, D.C.
- Helfer, Ray E. and Kempe, C. Henry, eds.
1968 The Battered Child. Chicago: University of Chicago Press.

- Henn, F.A.; Herjanic, Marijan and Vanderpearl, Robert H.
1976 "Forensic psychiatry: Profiles of two types of sex offenders."
American Journal of Psychiatry, Vol. 133, No. 6, pp. 694-696.
- Herner and Co.
1976 Four Perspectives on Child Abuse and Neglect Research. Prepared for the National Center on Child Abuse and Neglect, U.S. Department of Commerce, report number PB 250 852, Washington, D.C.
- Horowitz, Bernard
In progress, for New Jersey Division of Youth and Family Services, Trenton, N.J.
- Jackson, J.K.
1954 "The adjustment of the family to the crisis of alcoholism." Quarterly Journal of Studies on Alcohol, Vol. 15, No. 4, pp. 562-586.
- James, Jane E. and Goldman, Morton
1971 "Behavioral trends of wives of alcoholics." Quarterly Journal of Studies on Alcohol, Vol. 32, No. 2, pp. 373-381.
- Johnson, Bet and Morse, Harold A.
1968 "Injured children and their parents." Children, Vol. 15, No. 4, pp. 147-152.
- Kempe, C. Henry
1971 "Pediatric implications of the battered baby syndrome." Archives of Disease in Childhood (London), Vol. 46, No. 245, pp. 28-37.
- Knupfer, Genevieve
1967 "The epidemiology of problem drinking." American Journal of Public Health, Vol. 67, No. 6, pp. 973-986.
- Lemert, E.M.
1960 "The occurrence and sequence of events in the adjustment of families to alcoholism." Quarterly Journal of Studies on Alcohol, Vol. 21, No. 4, pp. 679-697.
- Levine, Harry
1977 "Colonial and Nineteenth Century American Thought about Liquor as a Cause of Crime and Accidents." Presented at annual meetings of SSSP, Sept.
- Levinger, George
1966 "Source of marital satisfaction among applicants for divorce." American Journal of Orthopsychiatry, Vol 36, No. 4, pp. 803-807.
- Lystad, Mary Hanemann
1975 "Violence at home: A review of the literature." American Journal of Orthopsychiatry, Vol 45, No. 3, pp. 328-345.
- Mayer, Joseph and Black, Rebecca
1976 The Relationship Between Alcoholism and Child Abuse/Neglect. Paper presented at the 7th Annual Medical-Scientific Session of the National Alcoholism Forum, May 7, Washington, D.C.
- McCaghy, Charles H.
1966 "Drinking and deviance disavowal: The case of child molesters." Social Problems, Vol. 16, No. 1, pp. 43-49.

- Mohr, J.W.
1964 Pedophilia and Exhibitionism. Toronto: University of Toronto Press.
- Nau, E.
1967 "Kindesmisshandling." (Child Abuse), Mischr. Kinderheilk, Vol 115, pp. 192-194.
- New York Times
1977
p. E3, March 20.
- O'Brien, John E.
1971 "Violence in divorce prone families." Journal of Marriage and the Family, Vol 33, No. 4, pp. 692-698.
- O'Donnell, John; Voss, H.; Clayton, R.; Slatin, G. and Room, Robin G.W.
1976 Young Men and Drugs -- A Nationwide Survey. NIDA Monograph, No. 5, Washington, D.C.: U.S. Government Printing Office.
- Parnas, Raymond I.
1967 "The police response to domestic disturbance." Wisconsin Law Review, Vol. 1967, pp. 914-960.
- Pittman, David J. and Handy, William
1964 "Patterns in criminal aggravated assault." Journal of Criminal Law, Criminology, and Police Science, Vol. 55, No. 4, pp. 462-470.
- Rada, Richard T.
1976 "Alcoholism and the child molester." Annals of the New York Academy of Sciences, Vol. 273, pp. 492-496.
- Radbill, Samuel X.
1968 "A history of child abuse and infanticide." Pp. 3-5, 13-17 in Helfer, Ray E. and Kempe, C. Henry eds., The Battered Child. Chicago: University of Chicago.
- Scientific Analysis Corporation
1976 "Family Problems, Social Adaptation, and Sources of Help for Children of Alcoholic and Non-Alcoholic Parents." Report prepared by Scientific Analysis Corporation, 210 Spear Street, San Francisco, California 94105.
- Scott, P.D.
1973 "Fatal battered baby cases." Medicine, Science and the Law, Vol. 13, No. 3, pp 197-206.
- Shaskan, Donald
1939 "One Hundred Sex Offenders." American Journal of Orthopsychiatry, Vol. IX, (July, 1939), p. 565-569.
- Shoham, S.G.; Ben-David, S. and Rahav, G.
1974 "Interaction in violence." Human Relations, Vol. 27, No. 5, pp. 417-430.
- Shoor, Marvin; Speed, Mary Helen and Bartelt, Claudia
1966 "Syndrome of the adolescent child molester." American Journal of Psychiatry, Vol. 122, No. 7, pp. 783-789.

- Snell, John E.; Rosenwald, Richard J. and Robey, Ames
1964 "The wifebeater's wife: A study of family interaction." Archives of General Psychiatry, Vol. 11, No. 2, pp. 107-112.
- Spejker, Gisela and Mouzakitidis, Chris M.
1976 Alcohol Abuse and Child Abuse and Neglect: An Inquiry into Alcohol Abusers' Behavior Toward Children. Paper presented at 27th Annual Meeting of Alcohol and Drug Problems Association of North America, Sept. 12-16, New Orleans, LA.
- Steinmetz, Suzanne K. and Straus, Murray A.
1973 "The family as cradle of violence." Society, Vol. 10, No. 6, pp. 50-56.
- Steinmetz, Suzanne K. and Straus, Murray A., eds.
1974 Violence in the Family. New York: Dodd, Mead, and Co.
- Straus, Murray A.
1973 "A general systems theory approach to a theory of violence between family members." Social Science Information, Vol. 12, No. 3, pp. 105-125.
- Swanson, David W.
1968 "Adult sexual abuse of children." Diseases of the Nervous System, Vol 29, No. 10, pp. 677-683.
- Truninger, Elizabeth
1971 "Marital violence: The legal solutions." Hastings Law Journal Vol. 23, pp 259-276.
- Virkkunen, M.
1974 "Incest offenses and alcoholism." Medicine, Science and the Law, Vol. 14, No. 2, pp. 124-128.
- Weinberg, S. Kirson
1955 Incest Behavior, New York: Citadel Press.
- Whitehurst, R.M.
1971 "Violence potential in extramarital sexual responses." Journal of Marriage and the Family, Vol 33, No. 4, pp. 683-691.
- Wilschke, K.
1965 "Über die kriminogene rolle des alkohols bei sittlichkeitsdelikten." (The criminogenic role of alcohol in sex offenses), Münchener Medizinische Wochenschrift, Vol. 107, No. 4, pp. 176-177.
- Young, Leontine
1964 Wednesday's Children. New York: McGraw-Hill.



50640

CHAPTER SEVEN

FUTURE RESEARCH ON ALCOHOL, CASUALTIES

AND CRIME: BUILDING A TRADITION

TABLE OF CONTENTS

	<u>Page</u>
Alcohol in the Casualty and Crime Literatures	578
Casualties and Crime in the Alcohol Literature	580
Establishing a Research Tradition	584
Data Collection, Storage and Analysis	586
Archiving of Existing Data	586
Funding Reanalysis	586
Securing and Improving Alcohol Coverage in National Reporting Systems, Censuses and Surveys	587
Taking Advantage of Natural Experiments	587
Funding New Studies	589
Some Directions for Future Research	590
Utilizing Existing Data	590
New General-Population Studies	591
New Studies of Serious Events	593
Research and the Prevention of Alcohol-Related Serious Events	595
Bibliography	603

As the preceding chapters indicate, the epidemiological literature on alcohol's role in casualties and crime is vast and various. But the conclusions which can be drawn from it do not form a lengthy list. Alcohol indeed is involved in many serious events; in at least some events the involvement helps precipitate the event; for some times and places and circumstances the proportion of events which can be attributed to alcohol has been quantified.

For purposes of public information and persuasion on the importance of alcohol issues, this may be enough: publicists have available a more than adequate collection of studies from which to pick and choose percentages of particular crimes and casualties which are "due to alcohol." Our argument in this report has been that, while such single percentages may be programmatically useful, they are often misleading. More importantly, they are inherently meaningless: alcohol's involvement in casualties or crimes is not a matter of immutable constants like a law of physics, but varies with time, place, actors and circumstances.

But there are more important purposes than public relations for studying alcohol's role in casualties and crime. The most important reason for such studies is to offer guidance on what to do to reduce the toll of alcohol-related serious events. For this purpose of preventing or reducing alcohol-related casualties and crime, most of the existing literature is essentially useless. As described above, most studies show the percentage of involvement of one aspect of alcohol in a particular type of serious event, or the proportion of alcoholics or problem drinkers who suffer the event. Some further breakdowns by demography of the participants or general characteristics of the event may be given. Then, in the discussion, there is speculation about what the nature of alcohol's role in the event may be, sometimes referring to biomedical or

experimental studies. This same form of study is repeated over and over, with little cumulation and with no direct testing of the speculations in the preceding papers. Any policies or preventive programs based on such studies must thus base the particular approach chosen on speculation and pious hopes, rather than any empirical evidence of the vectors and mechanisms of alcohol's involvement.

ALCOHOL IN THE CASUALTY AND CRIME LITERATURES

To transcend the present situation, we must first understand its conditions. The literatures on alcohol's role in casualties and crime are to a large extent "orphan" literatures: they have been seen as peripheral to the literatures on the various casualties and crimes, and have not been seen as central to the alcohol literature. Except in the area of alcohol and traffic safety for a few years in the late 1960s and early 1970s, there has been no professional corps of researchers with a continuing commitment to working in the area. Given the low academic prestige of "applied" research in general, and of the fields of alcohol, crime and accident research in particular, academic researchers have been involved in the field only when drawn in by specific contracts or studies. In the absence of specific funding in the area (except for highway safety, as noted), there has been no resource base for sustained work by non-academic research professionals.

The area of alcohol and traffic safety offers an example of an alternative scenario. In the peak era of the ASAP program, there was a considerable amount of contract research, and a core of research professionals was built up, which has now mostly dissipated with the decline of funding in the area. However, the research in this area, while relatively coherent and cumulated in a series of review articles, seemed to become rapidly fixed on a relatively small number of research questions and study designs. The result has been more a matter of technically proficient reiterations than of cumulative advance in thought.

Perhaps the era of solid funding of a research tradition was too short for innovations to emerge, or perhaps the research program was too closely tied to the programmatic solutions and assumptions of a particular approach, the ASAP program. For whatever reasons, the experience of the ASAP era suggests that while the flow of research money into an area begins a cumulative tradition of technical proficiency, it does not guarantee new approaches and initiatives in research.

The role of alcohol has varied in other casualty and crime literatures, but has been at most peripheral in modern times. Criminology arose as a field of study in the temperance era, and around the turn of the century the role of alcohol in crime was an important question. At least in its explicit measurement of multiple etiologies (including drinking) for crime, Koren's work for the Committee of 50 has not been surpassed by modern studies. But the alcohol issue lost its edge in criminology as elsewhere with the decline of the temperance movement. Modern criminological interview studies frequently include an alcohol question, but apparently more as a bow to longstanding tradition than from any sense of analytical purpose.

Literatures of more recent provenance tend to pay little attention to alcohol, at least in the design of empirical studies. The child abuse literature, which dates back only to the 1940s, includes little data on alcohol involvement in abusive events. The literature is dominated by a social casework perspective which is generally more interested in conditions than in events, and which seems to put a higher value on bolstering family solidarity than on asking potentially embarrassing questions such as about drinking. For another example, in the literature on fires, where engineers have tended to predominate, alcohol figures only as a minor dimension in a small enclave of the literature termed "human factors" in fires.

Perhaps the literature with the strongest modern tradition of measuring alcohol involvement, aside from traffic safety, is the literature of mortality

studies in what might loosely be called a public health epidemiology tradition. The conjunction of an available, indeed inert, subject and of readily applied body fluid alcohol content determination techniques has meant a ready publication opportunity for any research-oriented coroner. The shallowness of this tradition is suggested by the near absence of studies of injuries, where data collection would be more difficult, and by the general failure to collect and report variables not regularly available from the medical examiner's routine inquiries.

NIAAA should actively encourage consideration of aspects of alcohol as potential factors in the casualty and crime literatures. A variety of mechanisms can be used to accomplish this. NIAAA could sponsor seminars on alcohol and specific casualties or crimes bringing together those who have worked on alcohol's role in the area and leading researchers on the specific casualty or crime. NIAAA can seek coordination of research with federal agencies relevant to the casualty or crime, and can offer financial participation in research that involves an alcohol element. Under its own grant and contract programs, NIAAA can solicit or encourage new studies. Further comments on opportunities and pitfalls are given below.

CASUALTIES AND CRIME IN THE ALCOHOL LITERATURE

As noted above, alcohol's responsibility for casualties and crime was a prominent theme in temperance literature. It was particularly important as a temperance argument for action by legislatures: a common theme was to estimate the costs to the taxpayer of supporting the part of jail, poorhouse and asylum costs attributable to alcohol (e.g., Chipman, 1845). Alcohol's role in casualties and crime plays a similar role in the modern alcohol literature: a seemingly obligatory part of outlining the impact on society of the problems of alcohol abuse and alcoholism is a set of estimates of the proportion of various

casualties and crimes due to alcohol abuse or alcoholism. In the modern version of temperance economics, the costs of alcohol abuse and alcoholism not just to the taxpayer but to society as a whole are regularly estimated (Berry and Boland, 1977).

But apart from these public relations efforts, casualties and crime have remained curiously peripheral as concerns in the modern alcohol literature. Because of its assumptions, the alcoholism movement which has dominated thought about alcohol in the last one-third of a century has found the areas of casualties and crimes basically uninteresting.

(a) The alcoholism movement, emphasizing the disease concept of alcohol problems, has focussed interest on conditions rather than events. Serious events have been of interest not as subjects in their own right, but only as potential indicators of an underlying condition.

(b) The alcoholism movement, in the pursuit of its primary aim of securing humane treatment of the alcoholic, has been concerned not to identify itself either with the "wets" or the "drys." Since studies of alcohol's role in casualties and crime were so prominent a part of dry propaganda, researchers allied with the alcoholism movement shied away from the area.

(c) The alcoholism movement and the "new scientific approach to alcohol" espoused by its research allies gave systematic primacy to research into the causes of alcoholism rather than into the consequences of drinking. Alcoholism was the thing to be explained: consequences of drinking, to the extent they were of interest, were useful only as indicators of the individual course of the disease of alcoholism.

These three themes can be seen stated explicitly in Jellinek's seminal "Outline of Basic Policies for a Research Program on Problems of Alcohol" (1943), adopted as policy by the influential Scientific Committee of the Research Council on Problems of Alcohol in 1942.



CONTINUED

7 OF 9

(a) Jellinek decries the emphasis in the then-existing literature on the immediate effects of drinking rather than on "the origin of addiction and excessive drinking":

A list of publications on matters relating to alcohol would give the impression that the main problems are the effects of alcohol immediately following its ingestion. ... Today the question of the immediate effects of alcohol exists practically [i.e., is of practical significance] only in relation to automobile driving (1943, pp. 105-6).

(b) Jellinek does not specifically refer to the existing temperance literature on the consequences of drinking, but it is undoubtedly what he has in mind in commenting, concerning "the effects of inebriety on society," that the topic "has given rise to a considerable literature based on unsatisfactory material" (p. 109).

(c) Throughout Jellinek's discussion, systematic priority is given to "the problem of the origins and development of addiction and of other forms of abnormal drinking" as "the central problem of alcohol" (p. 105). "The effects of inebriety on society" are thus seen as "of less importance" than the question of "the influence of social factors on inebriety" (p. 109).

In line with these themes, Jellinek discusses studies of the effects of alcohol as primarily of importance for public relations:

At first thought it may seem unreasonable to assign secondary importance to such subjects as the relations of inebriety to divorce, family life, pauperism, delinquency, community life, etc. Investigation of these subjects may be of real use to the administrator, the penologist, and so forth. But as far the Council is concerned these subjects do not contribute to

the understanding in inebriety and only in a small measure to its prevention. On the other hand, such studies serve to characterize the magnitude of the problem of alcohol. Insofar as it may be necessary to educate the public on the magnitude of the problem in order to obtain its support, the fostering of such studies is justified. It is also justified from the viewpoint that the Council will be performing an expected public service by supporting such projects. When these motives are absent, however, these projects can be considered only as secondary interests of the Council.

In the current literature, the role of alcohol in serious events is still not an area of focussed attention. In the Journal of Studies on Alcohol's classification of abstracts, for instance, epidemiological studies of alcohol in serious events appear as undifferentiated subtopics under a variety of rubrics:

Psychiatry: Behavioral-Emotional Aspects [Suicide]

Psychiatry: Family Aspects [Family Abuse]

Social Aspects: Criminology-Penology [Crime]

Alcohol and Safety [Traffic]

Epidemiology and Statistics: Social; Medical [Mortality,
Injury, Traffic offenses]

With a few notable exceptions, established alcohol researchers in the U.S. have not been deeply involved in studies of alcohol and serious events, except for the researchers in the largely separate field of alcohol and highway safety. The U.S. experience differs from that in Scandinavia (Lahelma, 1977), where the existence of established alcohol social research centers and a more problem-oriented conception of alcohol issues has resulted in substantial though still sporadic research in the area.

With the weakening in the U.S. of the hegemony of "alcoholism" as the defining variable of the field, and the shift to a disaggregative conception treating the various alcohol-related disabilities and damages as problems in their own right, the time seems ripe for NIAAA to focus greater attention by alcohol researchers on alcohol and serious events. It is hoped that the present report offers a foundation for future work in the area.

NIAAA should focus attention of alcohol researchers on the role of alcohol in casualties and crime as a significant area for study. NIAAA should particularly encourage developmental work on new approaches and methods which examine the processes of alcohol's involvement in such a way as to suggest or test interventive and preventive measures. Ongoing alcohol studies should be encouraged to add casualties and crimes to their lists of areas covered.

ESTABLISHING A RESEARCH TRADITION

In most areas of the alcohol, casualty and crime terrain, there is not a lively cumulative research tradition. Even in the area of alcohol and highway safety, the cumulation has been selective rather than exhaustive, and the DOT base of support for the research tradition has eroded. If there is to be a lively tradition of research on alcohol, casualties, and crime, it must be established by NIAAA.

Some desirable dimensions of such a research tradition can be specified:

(a) it should view particular casualties and crimes in a comparative framework. We have found it useful and illuminating in the course of the present project to be considering particular kinds of serious events in a comparative framework. The literatures on particular casualties and crimes are often quite parochial, and confined to the perspectives of a particular disciplinary group. A lively integrated tradition will not be achieved by simply getting each casualty area to insert alcohol in some of its studies.

(b) it should be sensitive to the different issues implied by different aspects of alcohol. Researchers from outside the alcohol field are often quite insensitive to the variety of ways in which alcohol can be involved in a serious event, and to the potential meaning of different alcohol measures. One simple advance in much of the literature would be the measurement of more than one aspect of alcohol as part of a single study. It requires some time for researchers to become acclimated to alcohol issues, and it is desirable that experienced alcohol researchers be involved in the studies.

(c) it should measure potential other factors besides alcohol in multivariate studies. This is of both conceptual and policy significance. Conceptually, alcohol may simply be an incidental accompaniment while other factors play a determinative role. Where alcohol does play a determinative role, it is usually conditional: the event's occurrence depended on a number of factors besides alcohol. From a policy perspective, the alcohol factor may not be the easiest to change in an alcohol-related event, so that preventive strategies should often be non-alcohol-specific.

(d) it should be sensitive to issues of cultural definition. The role of alcohol in serious events is not simply a matter of pharmacological and physical actions; cultural attitudes and beliefs are also deeply involved. If drinking excuses behavior in a culture, people may get drunk before engaging in the behavior in order to excuse it. A drunken man who nearly drowns in cold water may plead ignorance of a possible interaction between alcohol and cold water, but a drunk driver who crashes in the U.S. can hardly plead ignorance of the effect of alcohol on driving: drunk driving occurs despite knowledge of its potential effects. Cultural and individual beliefs and perceptions about alcohol and its effects must be an important part of empirical studies of the role of alcohol in serious events. In the words of the famous sociological dictum, "When situations are defined as real, they are real in their consequences."

(e) it should seek to integrate epidemiological and experimental perspectives. General-population work and laboratory studies have tended to take little account of work in each other's tradition.

(f) it should be cumulative and innovative. While authors in the current literature often make some effort to review the literature in writing up their study, there is little evidence of cumulation in the design of studies. It is doubtful that an innovative and progressive literature can be attained by either of the funding mechanisms most easily available to NIAAA. Competitively-bid contracts based on Requests for Proposals hurriedly drafted by a hard-pressed staff will not often result in innovative studies. Neither is an essentially reactive stance to unsolicited grant proposals likely to forge a new research tradition. An innovative and cumulative research tradition requires continuing institutional bases of support.

DATA COLLECTION, STORAGE AND ANALYSIS

Archiving of existing data. We were astonished to find in the course of our attempts to retrieve existing data sets for reanalysis that much data had been thrown away or lost (see Annex A). This included, for example, the only substantial U.S. study of alcohol in emergency-room injuries. Data sets that are potentially useful for analysis should be archived along with their documentation. NIAAA should encourage such archiving as a norm of scholarship, and require it in contractual situations. A possible model for such an archive is the NIDA-funded DAEDAC at Texas Christian University.

Funding reanalysis. An archive will be a useless monument unless special attention is given to making funds available for reanalysis. The existing expectation among researchers is that grant funding is most likely for studies that collect new data; this expectation needs to be negated if good use is to be made of existing data.

Securing and improving alcohol coverage in national reporting systems, censuses and surveys. In many casualty and crime areas, there are existing or planned national reporting systems or series of censuses or surveys (see Annex A). Alcohol is covered only in passing if at all in many of these. Efforts should continue to negotiate with the relevant federal and other agencies improvements in the alcohol coverage, and securing the data for reanalysis.

This is an important effort in symbolic terms, since the negotiations and changes help sensitize the relevant agency to alcohol issues. But it should be recognized that the data from many of these systems is likely to be of little analytical utility. Some national reporting systems are a matter of jerry-built aggregation, and all are dependent to a greater or lesser extent on the vagaries of local cooperation and competence. The alcohol measures in these systems are likely to remain a matter of summary judgment by whoever fills out the reporting form at the local level.

It is doubtful, therefore, that national reporting system data will contribute materially to our understanding of alcohol's role in serious events. The primary aims of seeking inclusion of alcohol variables are (1) to increase the stock of alcohol problems indicators which can be used to monitor national trends in alcohol problems; and (2) to raise the consciousness of federal agencies and their constituencies concerning alcohol's role in the problems they address.

Taking advantage of natural experiments. Legislative, administrative and other actions frequently create discontinuous changes relevant to the relations between alcohol and serious events. These natural experiments offer an unparalleled opportunity for understanding the associations between alcohol and serious events and assessing possible ways of affecting them. Examples of studies using these natural experiments are a study of changes in alcohol problems indicators

following the great increase in alcohol availability and consumption in Finland in 1969 (Ahlström-Laakso and Österberg, 1977); the recent flurry of literature on the effects of lowering the drinking age on drunk-driving casualties (see review by Smart and Goodstadt, 1977) and studies of the effects of liquor strikes on casualty and crime rates (e.g., Mäkelä, 1974). Such studies have so far primarily been limited to alcohol-specific laws and actions. It would also be useful to study the effects of relevant non-alcohol measures on alcohol-related casualties, for instance the effect of the lowering of speed limits in the U.S. on alcohol-related traffic casualties.

Most studies of such natural experiments have relied on data from regularly-collected social statistics. Such data has the advantage of being available, without substantial added costs, for a post-hoc analysis. But it is far from being the ideal data for a multivariate analysis of change: the analyst is left in the end to speculation about the processes that might underlie the aggregate patterns found. Far more illuminating is a special study using a variety of methodologies which focusses on the processes as well as the net effects of the change. The study of the Finnish liquor strike is exemplary of this kind of research. In that study, much of the staff of the Finnish Social Research Institute for Alcohol Studies, and a number of interested staff members in relevant institutions, were mobilized to conduct a variety of studies in a dovetailing design (Mäkelä, 1974). Trends in hospital emergency rooms and police reports were recorded and analyzed, but there were also survey studies, observers counting the incidence of public drunkenness at selected places, an observational study on Skid Row, a study of trends in the price of illicit alcohol, etc. From this panoply of studies it was possible, for instance, to understand why the strike affected drunk driving rates less than other alcohol-related statistics, and what this might imply for prevention programs.

Such studies of natural experiments need an institutional base. The events often occur with little notice, which renders the usual mechanisms of contract or grant unusable for funding new data collection. Such studies require existing staffs which can be diverted on short notice to studying worthwhile events as they occur, as was done for the Finnish strike. Through alcohol research center funding, by creating a capability in its own staff, or through a contractual arrangement allowing for work orders on short notice, NIAAA should arrange for the study on a regular basis of natural experiments as they occur.

Funding new studies

It is conventional to conclude in reports of this kind that more research is needed. But in studies of alcohol and serious events, the most important need is for better research. Some of the characteristics it would be desirable to foster in such research are discussed above. In the following section, some general directions for future research are suggested.

In seeking to establish and foster a new research tradition, NIAAA should consider initiating a specific program of research into alcohol and serious events, in an appropriate institutional frame -- whether as a grant program, a research center, or through some other mechanism. The program should include a means for regular assessments of research priorities. The program should have a strong orientation to and linkage with NIAAA's prevention program, since the policy aim of the program is the prevention of alcohol-related casualty and crime.

SOME DIRECTIONS FOR FUTURE RESEARCH

Utilizing Existing Data:

While substantial reanalysis of existing data has been completed in the course of the present study, or is now near completion, there are a number of directions in which the analysis of existing data can profitably be pushed further.

(a) a number of substantial data sets have been obtained and readied for analysis, but have not yet been analyzed (see Annex A).

(b) several major studies which were underway in the past months will have completed data collection (see Annex A), and arrangements should be sought for analysis of their alcohol-relevant data.

(c) considerable useful work remains to be done using collations of two or more existing data sets. One form of such cross-analysis is the construction of "control-group" comparisons in general population data for Type II casualty data sets (see the Beck analysis in Suicide chapter for an example of this). Another form is the collation and analysis from various sources of the temporal and spatial patterning of alcohol consumption, of various serious events, and of alcohol-related serious events. Both drinking and serious events are highly specific to particular times and places, and a comparison of general-population drinking patterns with serious event patterns is potentially illuminating. Using time segments or places as the unit of analysis, a regression model can be used to make an indirect estimate of alcohol's contribution to particular types of serious events. A third form of collation study is the comparative analysis of patterns in studies in different geographical locations. Such an analysis of regional and urbanization variations in the association of alcohol and serious events can be based on the systematic quantitative summaries of the epidemiological literature prepared

during the present study.

(d) Interest has recently increased in cross-sectional and time-series analyses of the interrelations in populations of drinking patterns and amounts, alcohol policies, and a variety of alcohol problems indicators, including indicators of casualties and crimes. Such aggregate-level analysis is under way or planned in several research groups in conjunction with the forthcoming International Study of Alcohol Control Experiences.

(e) Many of the putative links between alcohol and serious events involve assumptions about the kinds of strengths of alcohol's specific effects on emotions and behavior. Though it is often easy to invoke an alcohol explanation of an event that has already happened, researchers have for some time recognized the difficulty attached to achieving something more than a post facto account. The literature readily concedes that alcohol may sometimes occasion aggressive behavior (say) -- but usually it does not. Thus, researchers have turned their attentions to a great variety of potential conditionals associated with the alcohol-aggression link. Studied have been the influences of setting, alcohol dose, personality variation, social class and cultural differences, and so on. Often this sort of research is carried out in alcoholic populations or in other sorts of captive groups like college psychology classes. There is need to carry out studies of the perceived effects of alcohol in general population sample. During the present project, a start was made on analysis of existing general-population data in this area.

New General-Population Studies:

General-population studies of drinking practices and problems have up till the present not emphasized the area of alcohol and serious events, although items in the area have often been included in general drinking problems scores.

One reason is that events that are really serious are very rare, and not easily studied in a general-population framework. But our review and reanalyses of existing data suggest some puzzles which general-population data can help address. (a) Quite generally, alcohol appears to be particularly involved in the most serious events. For minimal-level casualties, the association with drinking is often quite slight. (b) Alcohol seems to show a stronger relation to casualties in studies of samples of events than in studies of samples of people from the general population. These overall findings suggest directions for particular attention: (a) alcohol may contribute not so much to the occurrence of events as to determining how serious their outcome is; (b) particularly in middle age, heavy drinkers may be at less risk of casualties because of a sedentary lifestyle -- a barstool may be less hazardous than a ski slope; (c) alcohol may be more implicated in events than in people samples because the events tend to be concentrated among relatively few people, i.e., subsections of the population differentiated in other ways as well as in drinking may cumulate series of events. These areas for attention cannot be addressed only with general-population data, but general-population data can test the findings suggested by our review and reanalyses, can be used for a multivariate analyses of drinking and serious events controlling for lifestyle and other risk factors, and can begin to address the important question of how people avoid serious events while drinking. There is little reason why such studies should incur the added expense of a nationwide rather than locality sampling frame. But the sample needs to be quite large, and a new kind of questionnaire with detailed retrospective coverage of events and their conditions and sequelae needs to be developed. Provision should be made for a possible prospective follow-up design.

New Studies of Serious Events:

We have been surprised by the lack of studies of serious events which pay detailed attention to alcohol's place in the scenario of the event. Most data sets of samples of serious events contain only one alcohol measure, few other relevant potential conditions in the event, no information on the timing or sequencing of occurrences, and little information on characteristics of the event. The model of the multi-disciplinary accident investigation team used for aircraft crashes and to a limited extent in highway crashes does not appear to have been used for studies of alcohol's role in events.

Systematic studies of the scenarios of events -- of the sequence of occurrences, of the factors involved and of when they played their part -- will provide a base for knowledge from which preventive strategies can be identified and applied. These studies can be local and limited to particular classes of events: to understand the patternings involved, it is not necessary to invoke nationwide data collection or to attempt to stretch routine reporting systems to cover the special research agendas of such studies. In addition to the scenario of the event sampled, the histories of involvement of participants in the event in previous events should be ascertained, to allow a study of the cumulation of serious events in the history of particular individuals.

Research and the Prevention of Alcohol-Related Serious Events

The major long-term purpose of any study of the role of alcohol in casualties and crime is to provide a basis for reducing the rate of casualties and crime. There are a wide variety of ways in which an alcohol-related casualty or crime can be prevented. Some of these ways are alcohol-specific; others are not. For instance, particular alcohol-related traffic deaths could potentially be prevented

- * by persuading drivers to drink soft drinks at parties;
- * by installing drunk-proof ignition interlocks on cars;
- * by lowering the speed limit;
- * by putting a curfew on road traffic after midnight;
- * by persuading hosts to offer "crash pads" at parties for people to sleep off their drinking;
- * by deterring people from driving drunk by raising the penalties or enforcement;
- * by persuading sober drivers that drunk drivers make it too dangerous to drive after midnight on weekends;
- * by providing better public transportation on weekend nights;
- * by requiring airbags in cars;
- * by building better roads with fewer distractions;
- * by improving emergency and ambulance services;
- * by training people to drive better when they are drunk;
- * by persuading friends or potential passengers to intervene when a drunk person attempts to drive;
- * by informing or reminding people of the dangers of driving drunk;

- * by reducing the availability of automobiles;
- * by regulating the timing and location of private parties;
- * by reducing the availability of alcohol;
- * by fixing the minimum age for drivers licenses at 25;
- * by requiring someone to walk in front of each automobile with a red flag.

The list could be more or less indefinitely extended. The list is perhaps easiest to construct for traffic casualties because this is the area of alcohol-related serious events where the widest array of countermeasures have been put into effect or considered, but similar lists can be constructed for other casualties and for various crimes.

Some of the strategies of prevention are of course familiar, and some seem odd or ridiculous. The difference between the familiar and the odd is not a matter of their effectiveness; we regularly continue strategies of proven ineffectiveness but avoid potentially effective strategies. This helps alert us to the fact that prevention policy is not only a matter of choosing effective strategies; that moral and political choices are also very much involved.

While others than the drinker are often involved in casualties particularly in transportation and industrial accidents, the fundamental choice of strategies for casualties is between affecting the drinker's drinking or other behavior, making the physical environment less hostile to the behavior, or providing physical or temporal insulation between the behavior and the environment. Particularly when we are thinking in an overall framework of alcohol prevention policy, the tendency is very strong to zero in on the first choice. In our thinking about alcohol policy, there is very strong moral element, and to many it seems like coddling or condoning

drunkenness to redesign the world so it is safer for drunks, or to protect drunks from the consequences of their actions. It is perhaps because the field of alcohol and traffic safety has been set apart from the alcohol problems, in an agency dominated by engineering solutions to problems, that there has been a relatively strong tradition of environmental manipulation strategies as alcohol casualty countermeasures. This tradition has been reinforced in the recent literature by disillusionment with the attempts to change drinking behavior in the ASAP programs (Robertson, 1977).

In the prevention of crime, drinking behavior is potentially an issue with both the perpetrator and the victim; in fact alcohol may play a greater role for victims rather than for perpetrators. Strategies thus can be directed at the behavior of either party, at insulating potential victims from perpetrators, or at removing potential environmental facilitators of crime -- putting away weapons, locking cars, etc. The intentionality of crime puts a different cast on environmental and insulational strategies from such strategies for casualties: The emphasis must be on defeating human ingenuity rather than deflecting physical momentum. Since alcohol's role in crime has been seen primarily in terms of perpetrators, and environmental strategies are seen as primarily on behalf of the victim, such strategies do not bear the moral onus for crime prevention that they tend to bear for casualty prevention. On the other hand, since it is harder to defeat ingenuity than to provide padding, environmental strategies may well be less effective overall for crimes than for casualties: where premeditation is involved, successfully insulating one potential victim may simply jeopardize another.

To increase the usefulness of research on the role of alcohol in casualties and crime, it is important to consider and understand the ways in

which increased knowledge can contribute to prevention efforts.

(a) Research can serve as an instrument of overall policymaking, to establish and compare the effectiveness of different prevention strategies. The research in the alcohol and traffic field on the effectiveness of various countermeasures is exemplary of this function. The immediate audience for such research is those in a policymaking position, but the final audience of course is the citizenry to whom the policymakers are responsible. Policy decisions will not be based on effectiveness alone, but effectiveness is a substantial criterion for deciding on policies.

In the long run, evaluation research can be routinized into a monitoring function, although there is presently considerable room for inventive and original work in this area.

(b) Research can uncover hidden dangers and problems, and serve as a basis for consumer education. In the area of alcohol and accidents, there are a number of areas where there are hints in existing research of findings which when better established should be communicated to the world. For example, the seeming interaction of alcohol and cold water in drownings, the apparent relation of drinking and frostbite, the high rate of alcohol in the blood of victims of violent crimes, are all potential areas for communication that might constitute "news" and result in changes in behavior.

The function of research in increasing knowledge and promoting the rational avoidance of problems by self-directing citizens is a familiar and congenial theme in our culture, children as we are of the Enlightenment. It is thus especially necessary for us to be realistic about the limitations of this function of research. Knowledge is indeed powerful, but with respect to alcohol we live in a world where its power has already been largely used. People are in general quite well aware of the hazards of drinking, and their

behavior generally takes the hazards into account, balancing the hazards with competing values. For example, there can be few adult Americans indeed who are unaware that drinking increases the risks of driving. The blood-alcohol distributions observed in roadside breathtests are thus unlikely to be changed by teaching people the hazards of drunk driving; the distribution is in fact a distribution of behavior when the risks are known.

Knowledge about the harmful effects of drinking has been an important part of informal and formal education in the U.S. for well over 100 years. Large majorities of the general population will agree with knowledge items about specific harmful effects. While there are important special situations where new knowledge about casualties or crime may influence people to change their drinking or associated behaviors, overall the remaining contribution of research in this area is more in quantifying what is already known rather than contributing substantial new information.

It is worth noting that from a preventive standpoint there is knowledge which is better suppressed than trumpeted abroad. For instance, the general population may well not realize that their chance of being arrested on a particular drunk driving occasion is less than one in a thousand. For such knowledge, we tend to abandon our populist and rationalist assumption that the more knowledge imparted to the more people, the better off we all will be.

(c) Research can be used to influence cultural beliefs about and social reactions to drinking. An at least partially successful example of this is the campaign to redefine drunk driving as primarily attributable to problem drinkers.

This campaign was based on research findings, although the conclusions drawn from the research can be strongly questioned (see chapter on Alcohol and Traffic). The campaign was explicitly aimed at changing cultural beliefs

about the social location of drunk driving, to counteract others' fellow-feelings with drunk drivers -- "there but for the grace of God go I". Thus it was hoped that policemen, prosecuting attorneys, judges and juries would be more likely to arrest, convict and sentence drunk drivers, thereby improving the law's power as a deterrent.

This use of research of course overlaps the use in knowledge dissemination, but is distinguished by the attempt to change general values and beliefs, rather than offer practical knowledge to be applied in concrete situations. The use of research for persuasion about general beliefs and values concerning alcohol has a lengthy history. The temperance movement always had a strong interest in collecting statistics and facts seen as helpful in persuading to the cause, and the earliest studies of alcohol's role in casualties and crime (e.g. Chipman, 1845) were motivated by the desire for a concrete factual basis for temperance arguments.

This use for research is more likely than any other to distort the research results, since research findings become simply handy tools to some higher purpose. Research on alcohol in casualties and crime has been particularly subject to this use, since attributing indubitably undesirable events to alcohol has been seen as a major way of enhancing the size and seriousness of the problems of alcohol. We quoted at the beginning of the chapter Jellinek's innocently cynical argument that public relations purposes were the only justification for research on the effects of inebriety. The tradition continues today in the common habit of setting the stage for discussions of alcoholism and alcohol problems with a few quick negotiated statistics on what proportion of traffic crashes, homicides, etc. are due to alcohol. That few people have been able to see beyond this purpose for studies of alcohol, casualties and crime has been a major reason for the stultification of the research literature.

A major premise of our approach in the present study has been to treat cultural beliefs about and definitions of alcohol's role in casualties and crime as part of the research agenda. In pursuit of this agenda, papers were completed on the history of American beliefs about alcohol's role in casualties and crime (Levine, 1977) and the treatment of the relationship in the criminal (Epstein, 1977) and civil law (Dooley, 1977). These papers together suggested the importance of the cultural belief in alcohol's power to control behavior as a self-fulfilling prophecy. This suggestion, in line with MacAndrew and Egerton's earlier analysis (1969), converges with recent experimental evidence of the greater effect on behavior of beliefs about alcohol than of alcohol's pharmacology (Lang et al., 1975; Wilson and Lawson, 1976). The belief in alcohol's malignant powers which is our heritage from the temperance era often serves to excuse drunken behavior. Thus, ironically, research tends to suggest that a downplaying of alcohol's role in casualties and crime may eventually lead to a reduction in the relationship.

(d) Research can be used to find manipulations of the environment which will reduce alcohol-related casualties and crimes. In our view this is at once the most neglected and the most promising use for research. It requires painstaking and detailed studies of serious events with attention to the occurrence and sequencing of contributing factors and to potential strategies of prevention or intervention. It is not at all oriented around the quick and easy single figure of alcohol's involvement in the event. But it seems to hold the greatest short-term potential for reducing alcohol-related casualties, and perhaps crimes.

Human behavior, particularly behavior like drinking which is valued and culturally entrenched, is not easy to change, particularly in the short run. The advantages of environmental modification were an early experience of public health epidemiology: when Dr. Snow failed to persuade others about the

association of cholera and the water-supply, his recourse was to wrench the handle off the pump.

It should be recognized that there are limits to the technological solution. It tends to be elitist and technocratic, and to create no base of popular support or understanding. Thus there are limits to the inconvenience or added cost which will be tolerated in such solutions, as evidenced by the fate of the seatbelt interlock.

There are also ethical constraints on an environmental modification strategy. It tends to substitute for the populist image of the consumer as rational autonomous choice-maker the image of an irrational ward of the state, who must be protected from himself. For technological solutions to safety problems in general, the populist image is not directly countermanded: the theory is that design flaws expose rational consumers on to hidden risks they cannot reasonably foresee on an individual basis. When a personal behavior like drinking is involved, however, we tend to see the fault as in the drinker rather than the environment. The ethical issue is raised of the responsibility or indeed the right of a government to protect its citizens from their own folly.

Perhaps more importantly, environmental modification strategies invoke the moral question, still important in our culture, of appearing to condone drunkenness. Joseph Gusfield (personal communication) has noted that "we still operate very much on the idea that somehow it is, indeed, sinful to drink or be drunk", so that to suggest research on how people avoid harm while under the influence of alcohol "sets up only smiles and embarrassment." Though few would argue that the only good drunk is a dead drunk, there is considerable unspoken resistance to research or measures which might ameliorate the consequences of drunkenness. If similar attitudes had controlled research in venereal diseases, general paresis might still be a major part of mental hospital caseloads.

The common assumption in consumer product safety research is that, except for children and disabled persons, the consumer is in full command of his mental and physical faculties in using the products tested. No recognition is given to the fact that the products will at least occasionally be used by consumers in an inebriated condition. A serious aim of research into alcohol's role in casualties and crime should be to make the world safer for drunkenness. Whether this will result in more drunkenness is an interesting empirical question, but hardly a justification for tolerating continued deaths and injuries.

BIBLIOGRAPHY

- Ahlström-Laakso, Salme, and Österberg, Esa
1977 "Alcohol Consumption and Alcohol Problems in Finland 1951-1975"
Presented at the Epidemiology Section, 23rd International Institute
on the Prevention and Treatment of Alcoholism, Dresden, GDR, June.
- Berry, Ralph E. and Boland, James P.
1977 The Economic Cost of Alcohol Abuse. New York: The Free Press.
- Chipman, Samuel E.L.
1845 The Temperance Lecturer: Being Facts Gathered from a Personal
Examination of All the Jails and Poor-Houses in the State of New
York; Showing the Effects of Intoxicating Drinks in Producing
Taxes, Pauperism and Crime. Albany, New York.
- Dooley, David
1977 "Alcohol and Legal Negligence." Berkeley, California: Social
Research Group, Working Paper No. F62.
- Epstein, Thomas
1977 "A Socio-Legal Examination of Intoxication in the Criminal
Law." Berkeley, California: Social Research Group, Working Paper
No. F53.
- Jellinek, E.M.
1943 "An Outline of Basic Policies for a Research Program on Problems
of Alcohol." Quart. J. Stud. Alc. 3:4 (March), pp. 103-124.
- Lahelma, Eero
1977 Scandinavian Research on Alcohol's Role in Casualties and
Crime: A Review Essay and Informative Abstracts. Berkeley, California:
Social Research Group, Report No. C20.
- Lang, A.R., Goeckner, D.J., Adesso, V.J., and Marlatt, G.A.
1975 "Effects of Alcohol on Aggression in Male Social Drinkers."
J. Abnorm. Psychol. 84, pp. 508-518.
- Levine, Harry
1977 "Colonial and Nineteenth Century American Thought About Liquor
as a Cause of Crime and Accidents." Berkeley, California: Social
Research Group, Paper No. E48.
- MacAndrew, Craig and Edgerton, Robert B.
1969 Drunken Comportment: A Social Explanation. Chicago: Aldine
Publishing.
- Mäkelä, Klaus
1974 "Types of Alcohol Restrictions, Types of Drinkers and Types of
Alcohol Damages: The Case of the Personnel Strike in the Stores of the
Finnish Alcohol Monopoly," pp. 16-27 in: Papers Presented at the 20th
International Institute on the Prevention and Treatment of Alcoholism;
Manchester, England. Lausanne: ICAA.

Robertson, Leon S.

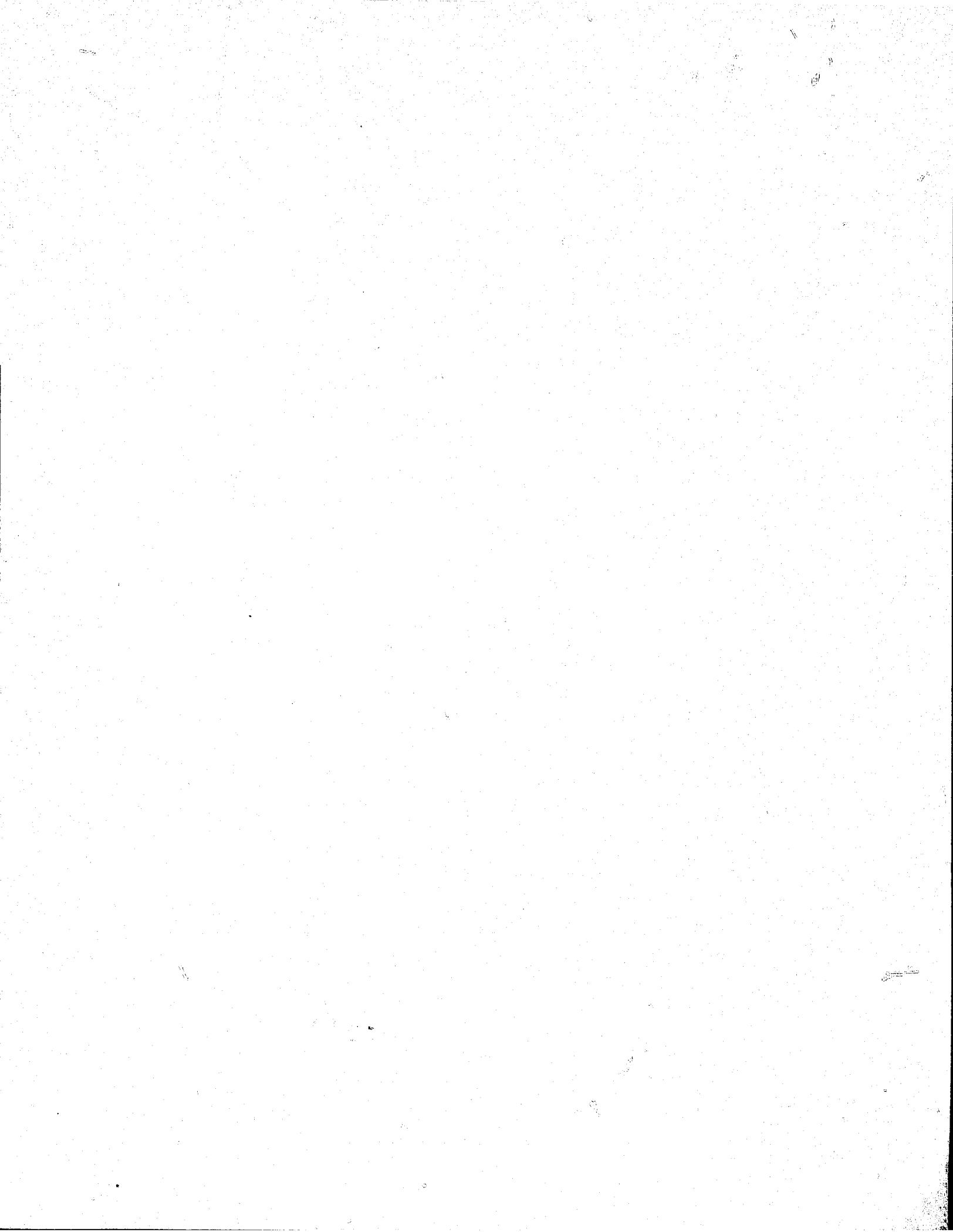
1977 "Evaluation of Community Programs," presented at the Plenary Session on Public Information and Education, Seventh International Conference on Alcohol, Drugs and Traffic Safety, Melbourne, Australia, January.

Smart, R.G. and Goodstadt, M.S.

1977 "Effects of Reducing the Legal Alcohol-Purchasing Age on Drinking and Drinking Problems; A Review of Empirical Studies." J. Stud. Alc. 38:7 (July), pp. 1313-1323.

Wilson, G. Terence and Lawson, David M.

1976 "Expectancies, Alcohol and Sexual Arousal in Male Social Drinkers." J. Abnorm. Psychol. 85:6, pp. 587-594.



ANNEX A

A REPORT ON THE RESULTS OF THE
RESEARCH NETWORK INVESTIGATION

by

Vicki Schneider

TABLE OF CONTENTS

	<u>Page</u>
I. The Research Network	607
II. The Results of the Research Network Effort	610
III. Quality and Scope of Alcohol Reporting	612
No Alcohol Data or Unretrievable Data	612
Underreporting of Alcohol Involvement in Non-Fatal Accidents	614
Quality of the Alcohol Measure	615
Clinical Data	615
Underanalyzed Data	616
Lack of Contextual Data	616
Summary and Recommendations	617
Appendix A. Local Agencies and Research Groups	619
Appendix B. Major Bibliographies Used	620
Appendix C. Computer Searches	623
Appendix D. Frequently Used Libraries/Publications Lists	624
Appendix E. Report on National Fire Protection and Control Agency Data System	625
Appendix F. Samples of Reporting Forms	628
Appendix G. List of Data Files Actively Sought	641
--Accidents	641
--Traffic	644
--Crime	647
--Suicide	651
--Family Abuse	652
--Juvenile Delinquency	655

An extensive effort was made to locate recent research in each casualty area and in the alcohol field generally. Sources for the research network or "grapevine" were numerous and varied. Sources included computerized searches from agencies and clearinghouses, research project bibliographies, contact with major social research centers and agencies concerned with the casualty areas. The aim of the research network effort was to find unanalyzed or underanalyzed data which would help describe and explain the role of drinking in serious events.

In the course of looking for data we gathered much information on the scope and quality of the reporting of alcohol involvement in serious events as collected by federal, state and local systems. The purpose of this report on the research network is to summarize some of these findings and to give a "grapevine" history. Section I presents an overview of the agencies, bibliographies and computer searches which were used. Section II includes an annotated list of the results of the "grapevine" effort. Section III is a review of the scope and quality of alcohol reporting.

Section I.

The Research Network

It must be said at the outset that our difficulties in finding leading researchers in the areas as well as gaining access to data were, in large part, a function of the embryonic state of "serious events" as a field of research. State and federal agencies are often unfamiliar with work done in university settings and university researchers are typically not good sources of information on work done outside their institutions. Several casualty areas are functioning

fields of research in their own right e.g., family abuse and crime, but alcohol research is not a common by-product. Additionally these are not areas of research that have made their way in any important sense into the alcohol field.

Our earliest sources of information on casualty-related alcohol reporting systems and casualty-related alcohol research generally were national, regional and community agencies and research centers. Appendix A includes a list of the agencies and research groups which were contacted. In addition, indexes of research projects and grants were scoured for projects of related interest. Two hundred calls were made to administrators and researchers in order to find data sets and/or alcohol reporting systems which would provide us with published or raw data.

A primary source of material for the study was bibliographic data. Many agencies provide extensive bibliographies. In some cases the services are computerized while others are not. Bibliographies in general do not note alcohol information with consistency. This is true of annotated bibliographies as well. The National Clearinghouse on Alcohol Information is of course the most comprehensive governmental source of alcohol information. However, the grapevine uncovered other useful bibliographies. These are listed in Appendix B. Twelve computer searches were requested using an extensive set of "key words." The searches are listed in Appendix C. The keywords are listed below.

Alcohol, Alcoholism	Social (w) Problems
Drinker	Victim
Drinking	Divorce
Intoxicant	Illegitimacy
Criminal	Loneliness
Crime	Poverty
Child (w) abuse	Prostitution
Delinquency	Abandoned (w) Child
Violence	Battered (w) Wives

Violent (w) Behavior	Beating (w) Wives
Drowning	Driver
Aggressive (w) Behavior	Highway
Suicide	Homicide
Accident, Accidents, Safety	Sex Crimes
Fires	Murder
Fall, Falls	

Cross-referencing casualties with "alcohol" or "drinking" proved to be disappointing. Several searches adapted this list of keywords to their dictionary.

In one case in particular we were surprised by the results of our request for a computer search. A Los Angeles firm, Documentation Associates, Inc. appears to have access to national archival data, using a data base called TRIS (Technical Research Information System). We ordered their search primarily to check our already extensive listings. The listing proved to be hundreds of pages in length. Many listings were, to be sure, duplicates of information on hand. Nearly 100 listings were listed under the NTIS "PB" numbering system and should have been available through NTIS (National Technical Information Systems, Washington, D.C.). The numbers were in fact old ones and were unlocatable at NTIS. Both Documentation Associates and our group tried in vain to work with NTIS to find the listed reports. Documentation Associates had no cross-referencing system with current NTIS numbers. Most of the listed publications were unavailable in any of our libraries. Presumably, if found, these reports could have been purchased from NTIS. It would not have been economically feasible for this project since costs were \$6 to \$12 per report. This was an expensive search. Serendipitously it did serve to point out the fact that much of the material available for sale through NTIS is unavailable in the University or State libraries and thus is essentially unavailable to projects doing comprehensive reviews.

Another search proved equally disconcerting. The National Council on Crime and Delinquency offers a search service and an annotated bibliography. This search yielded a small bibliography and extensive annotations on only a few items in an area which proved to have a large literature. The problem appears to be that "alcohol" is not commonly used for cross-referencing.

Bibliographies were, in general, difficult to use both in the research network effort and in the literature review. Since there is no common form of abstracting empirical research, it is often not possible to tell which articles contain data on drinking or how extensive the data is, if present. When titles only were used in the cataloguing system, retrieval was most unsatisfactory. These problems were especially acute in casualty areas in which we were heavily dependent on recent bibliographies, e.g., industrial accidents, child abuse, and fire.

The TIPS (Technical Information Projects Service) search provided us with up-to-date information on current research projects. This was supplemented by the DHEW's Research Grant's Index, Behavior Research Studies (Behavioral Research Survey Center) and Survey Research (University of Illinois). From the variety of sources analysts in each casualty area selected several data sets with possibilities for re-analysis.

Section II

The Results of the Research Network Effort

Appendix G lists some of the important data sets which were pursued. This appendix includes sets on hand, as well as original computer runs which were done for the casualty study by other investigators.

Data sets could not be obtained for a variety of reasons. In some cases the original researcher refused us the data. Guze did not want to release his 1962 crime data hoping to do more analysis himself. Lloyd Shupe's assistant in Columbus, Ohio offered their vast collection of data

on traffic accidents but after many weeks of negotiations, phone calls and letters the data was never sent. Some important data sets had been lost or destroyed. Wolfgang's early homicide study was destroyed in a fire. The computer tape of Argeriou's study of the temporal patterns of drinking had been erased a week before our call.

A number of data sets were received and many investigators graciously gave their time to consult on the use of their data sets. The data sets on hand are given in column 1 of ~~Appendix C~~. The number of data sets or special runs received in each casualty area was as follows:

Accidents	5
Traffic	2
Crime	5
Suicide	2
Child Abuse	2

Substantial use was made of the Social Research Group's general population surveys as well.

The failure of investigators to maintain data sets proved our most serious problem. Only a limited amount of alcohol-related data is currently held in data archives. An archive of data sets should be a priority if secondary analysis is to be done in the future. Specialized research centers like the Highway Safety Research Institute which have extensive data on alcohol involvement in accidents should be encouraged and supported to maintain a listing of data sets which are of relevance to those in the alcohol field.

The grapevine effort would have profited from a data archiving system like the Drug Abuse Epidemiology Data Center, at the Institute of Behavioral Research, Texas Christian University. They have appealed to drug researchers with the following:

"You may have completed a drug abuse study within the last year, but may not know where your data is today. You may not even be certain that the cards are still usable or that the tapes are still machine readable. DAEDAC is vitally interested in the preservation of data relevant to drug abuse. The center will not only clean and store your data, but will deposit one copy in a bank vault. The rights of contributors are protected and explicit citations of source works are made. Contributors retain ownership of their data and are reimbursed for costs entailed in preparing copies of files for DAEDAC."

Section III.

Quality and Scope of Alcohol Reporting

Data on alcohol presence in serious events available from major casualty reporting systems is limited and is characterized by a wide range of reporting problems. These include lack of specificity in coding the alcohol data; no attempt to code level of BAC or number of drinks; no implied consent in areas other than driving; underanalyzed data from studies which include a drinking measure. Some of these problems are discussed below. This section is organized by type of problem rather than casualty area. The exemplary material is not comprehensive but suggestive.

No Alcohol Data or Unretrievable Data

Several important surveys and reporting systems have no alcohol-specific data or gather data in such a way that the alcohol data cannot be separated out from other substances. Surveys of criminal victimization are an important example. The victim surveys carried out by the census are an important source of data on crime, yet none of the surveys has included information on the victim's drinking or the perceived intoxication of the offender. In addition, the FBI Uniform Crime Reporting System does not routinely publish alcohol data, although many of the individual reporting

areas collect this data. The California Bureau of Criminal Statistics keeps files on all homicides in the state, which include data on the offender's and victim's drinking, but these data are not coded. Data on drugs are coded, but only because of a special grant to the Bureau from another state agency.

Commonly alcohol and drugs are aggregated together on reporting forms. When drugs are the focus often alcohol is ignored in gathering data or left unanalyzed. The tradition in fire reporting is to aggregate information under a "human factors" category when indications are that other than structural factors were at play in a fire casualty. Drugs, sleepiness and alcohol are usually confounded. (See for example Appendix E.)

Data collected by casualty related agencies often reflect an agency's specific interests. The Consumer Products Safety Commission collects vast amounts of data, but does not maintain alcohol information in an easily retrievable fashion. The following is an excerpt from a letter we received from them regarding the coding of data in the National Electronic Injury Surveillance System:

"If a person of any age is involved in an accident while his conscious state is altered by alcohol, the product associated with the injury is coded. For example, if a person is drunk and falls through a glass storm door, the glass storm door is coded. We do not have any provisions for specifying alcohol involvement in such crashes... although NEISS is a bi-level system consisting of the surveillance data from the NEISS hospitals and the in-depth investigations, no in-depth investigations have been performed in the product code for Beverage alcohol."

The Commission clearly reflects a problem common to many agencies -- the failure to see serious events as a function of the interplay of multiple factors, in this case the interaction of alcohol and a glass door.

The National Child Abuse Registry is a newly developing reporting system. As yet there appears to be no guidelines for gathering data on alcohol involvement in child abuse events.

Examples of casualty reporting forms from several agencies and research projects are found in Appendices E and F.

Underreporting of Alcohol Involvement in Non-Fatal Accidents

Agencies which do attempt to collect alcohol information depend on the cooperation both of investigators of serious events and victims. The limited applicability of "implied consent" often results in better reporting for fatal as compared to non-fatal events. The Federal Aviation Administration, for example, has explicit guidelines for investigators on both types of accidents. The reporting forms and regulations come from the National Traffic Safety Board (DOT) and are apparently used by the U.S. Coast Guard, the Federal Aviation Administration and the St. Lawrence Seaway Corporation. As rules stand now, non-fatal accidents are investigated by the Federal Aviation Agency itself. The eight page reporting form has a small space on the last page for a narrative description of the flight crew members. (See Appendix G for examples of reporting forms.) The directions read, "Determine the amount of rest prior to the flight and whether liquor or drugs were involved." Medical examiners are directed to check for evidence of alcohol, drugs or medicine in the wreckage and "Blood alcohol tests are desired on all fatal crew members. These tests may be done on survivors if they consent." In our conversations with the FAA it was reported that the National Traffic Safety Board is beginning the procedures to require "implied consent" for BAC testing when licensing crew members for flights. The NTSB does investigate fatal accidents presently and apparently routinely takes BAC's.

Quality of the Alcohol Measure

It is often the case, even in areas where the presence of alcohol has long been noted, that data on drinking is very limited. For example, homicide reports typically include only the presence or absence of alcohol; often this is coded only for the situation generally, rather than victims and offenders specifically. No records are kept of the offender's perceptions of the amount and patterns of drinking. The amount and patterns of drinking, however, are important in determining the drinking context and the interaction of drinking and other factors, e.g., fatigue. The Law Enforcement Assistance Administration in their national survey of prisons include only minimal information on the presence of alcohol, even though 43% of the prison offenders report that they were drinking prior to the crime. The following questions are included in their survey:

1. At the time of any offense that caused your imprisonment now, had you been drinking?

Yes, No, Don't Know

2. How much had you been drinking?

Lightly, Moderately, Heavily

3. What had you been drinking?

Beer, Wine, Liquor, Not reported (multi-entry)

Clinical Data

In a casualty area like suicide most alcohol-specific data is gathered in a clinical setting. Research and reporting norms do not guide data collection in a way which leads to the easy retrieval of alcohol information. Clinical data tends to remain uncodified. Much information is held by clinicians whose opinions about the subjects are seen as more important "data" than the primary information. There are no common guidelines for data

collection on substances such as alcohol and drugs in clinical case studies.

A major problem with clinical data is confidentiality. Hospitals, like the Kaiser-Permanente group, with permanent research arms may be an important source of clinical data for future work. Emergency room data is a potential source of data on drinking and accidents, however alcohol data is not yet routinely collected.

Underanalyzed Data

Coroners offices, fire marshalls, and police departments often collect data on drinking. Potentially these are important sources of alcohol-specific data, but currently most of this data is available only in raw form.

Gathering alcohol-specific data is often the secondary objective in the study of some other social problem. As such the data is often under-analyzed. The early Wolfgang study of homicide could have been used for a serious analysis of the role of alcohol in homicide events. Since it was of secondary importance to the investigators little alcohol-specific analysis was done. Frank Hartleroad, a student of Wolfgang's, is currently replicating the early study. This will be a rich data set with much potential for the study of alcohol's role in homicide. Research projects whose progress should be followed or active encouragement offered are listed in the second column of Appendix G.

Lack of Contextual Data

Several data collection systems have an accurate measure of the alcohol variable but do not measure, in any detail, the context of the casualty. This is often the case with data on traffic accidents. The National Highway Traffic Safety Administration has collected vast amounts of data but reports little data on the context of the accident. This was true of many of the data files kept by the Highway Safety Research Institute. Without

contextual data it is not possible to disaggregate accidents by type and look for internal variation in alcohol involvement. Further, without contextual data it is not possible to develop scenarios which would more clearly place the role of drinking in the series of events which lead up to an accident.

Summary and Recommendations

The casualty study's "grapevine" search attempted to find and to obtain existing data sets that might provide useful data for secondary analyses of the relations between alcohol and serious events. This effort encountered several sorts of difficulties, which, in turn, might form the basis for the development of NIAAA policy directed at enhancing the ease with which future secondary analyses might be conducted. As we have described above, the difficulties encountered fell into three rough types: things which made the data difficult to find; once found, things that made it difficult to obtain; and, once obtained, things that made the data less useful than it might otherwise have been.

Data sets often were hard to find because of the newness, isolation, and fragmentation of these research areas. It is suggested that supporting and developing a continuing research tradition in alcohol studies, and evolving in this way scholars with a command of these diverse and fugitive territories, offers the best possible response, though of course this recommendation involves matters far beyond the issue of good data-set finding. We also found that bibliographical and other computerized searches often should be regarded with a healthy skepticism. Certainly the growing practice of letting computer searches provide the literature and data reviews for research projects should be discouraged, and inter-service bibliographic checks probably ought to be encouraged as a matter of good procedure where such checks are possible. Computerized searches ought to serve as a means for augmenting and checking researchers' coverage of relevant literatures

rather than as the primary method for such reviews.

Obtaining data sets involved difficulties at least as serious as finding them. Often, important data sets had been lost, or allowed to deteriorate, or destroyed. Some Researchers greeted efforts to obtain their sets with procrastination, discovery of residual self-interests, and even outright refusal. Often, moreover, the negotiations surrounding obtaining a given data set involved a wide variety of topics in which the would-be secondary analyst had to chart new policy territory. Raised were issues of confidentiality, the original researcher's publication rights and citation problems, problems of remuneration, and so on. Too few incentives seemed to surround the sharing of data, and many disincentives seemed to suggest not sharing.

These difficulties suggested to us the need for study of appropriate and fair procedures for data set procurement between the secondary analyst and the primary researcher. It also suggests new attention to the proper banking of NIAAA supported studies once they are completed and as well the need for substantial data archives -- perhaps located in the newly funded Alcohol Research Centers Program.

Even after the data set has been obtained, many sorts of difficulties may weaken its usefulness. Alcohol measures are often peripheral to various casualty areas, alcohol data may not be collected at all, or collected but not coded, or, if coded, lumped together in ways that are not optimally useful. The collected data may reflect the special interests or particular agencies or theoretical perspectives. Drinking data is often poorly collected, inappropriately or insufficiently analyzed, and un- or underreported.

Once more, these sorts of difficulties suggest the need for the development by NIAAA of inducements, encouragements, and guidelines for the development and diffusion of good alcohol-data collection, coding, and reporting.

Appendix A. Local Agencies and Research Groups

Local Agencies

San Francisco Fire Department
San Francisco Police Department
San Francisco Department of Public Health
Chapel Hill, North Carolina, Coroner's Office
Oakland Police Department
Kaiser Hospital, Oakland, Ca.
Kaiser Hospital, Portland, Ore.
Health Insurance Plan of New York
Children's Hospital, Oakland, Ca.
San Francisco General Hospital
San Francisco Children's Hospital

Research Groups

Berkeley Planning Associates
Criminological Research Associates, Berkeley
The Drug Abuse Epidemiology Data Center, Texas Christian University
Highway Safety Research Center, Chapel Hill, N.C.
Johns Hopkins University Applied Physics Lab.
Joint Fire Research Organization, Great Britain
Metropolitan Life Insurance Corporation
Narcotics Education, Inc., Washington, D.C.
National Research Council of Canada
Public Systems Research Institute, University of Southern California
Research Triangle Institute, Durham, N.C.
University of Michigan Highway Safety Research Institute
University of North Carolina Center for Alcohol Studies

Appendix B. Major Bibliographies Used

MAJOR BIBLIOGRAPHIES

	Annotated	Extensively Annotated	Citations of References Within	Titles Only
Center for Correctional Psychology, University of Alabama <u>Toward The Prevention of Rape</u> , Editor Marcia Walker		X		
Behavioral Research Survey Center, New York "Behavioral Research Studies Monthly Index." (1975 to July 1977)				X
Department of Health, Education and Welfare "Bibliography on the Battered Child" "Child Neglect: An Annotated Bibliography," by Polansky, N.A.; Haley, C; Lewis, J. and VonWormer, K.	X			X
"Research, Demonstration, and Evaluation Studies on: Child Abuse and Neglect," Intradepartmental Committee on Child Abuse and Neglect, Fiscal Year 1974				X
"Child Abuse and Neglect: A Report on the Status of the Research," Hurt, Maure, Jr. 1974	X			
"Federally Funded Child Abuse and Neglect Projects, 1975" Herner and Co.	X			
"Analysis and Status of Child Abuse and Neglect Research" 1976				X
Highway Safety Research Institute, University of Michigan "Alcohol Safety Action Project Bibliography," Ann C. Grimm, Compiler, October 1976 "Tenth Anniversary Bibliography, 1966-1975" "Work in Progress, 1976"				X
"Drinking and Driving; A Bibliography of Current Popular Literature"	X			X
National Clearinghouse for Alcohol Information <u>International Bibliography on Crime and Delinquency</u> , Vol. 1 (1963) through Vol. 8 (1972)				X

MAJOR BIBLIOGRAPHIES (continued)

	Annotated	Extensively Annotated	Citations of References Within	Titles Only
National Clearinghouse of Child Abuse and Neglect "Highlights of 1974 National Data"	X			
National Council on Crime and Delinquency <u>Bibliography: Alcohol and Crime</u>				X
National Institute on Alcohol Abuse and Alcoholism "Alcohol, Drug Abuse and Mental Health Administration, NIAAA Research Grants," Fiscal Years 1974 and 1975				X
National Institute of Mental Health Publications List "Selected References on the Abused and Battered Child" (Bibliography, 1968-72; Supplement, 1970-1973) "Bibliography on Suicide and Suicide Prevention, 1897-1957, 1958-1970," by Norman L. Farberow "Violence at Home," edited by Mary Lystad		X		X X X
National Technical Information Service Catalog of Government-Sponsored Research				X
Rutgers Center for Alcohol Studies <u>International Bibliography of Studies on Alcohol</u> , Vol. 1 (1966) and Vol. 2 (1968)				X
Stanford Research Institute "A Preliminary Survey of the Alcohol Literature Associated with Special Population Groups."				X
Feller, Irving <u>International Bibliography on Burns: for Better Patient Care, Research, and Teaching</u> , Ann Arbor: American Burn Research Corporation, 1969.				X
Wolfgang, Marvin 1973, <u>The Sociology of Crime and Delinquency</u> Unpublished.				X *

*Some annotated entries

MAJOR BIBLIOGRAPHIES (continued)

World Health Organization
International Congress on Child Abuse and Neglect,
Sept. 1976

Annotated

Extensively Annotated

Citations of
References Within

Titles Only

X

Appendix C. Computer Searches

COMPUTER SEARCHES	Annotated	Extensively Annotated	Citations of References Within	Titles Only
Dissertation Abstracts (DA)				X
Documentation Associates Information Service (TRIS base)	X			
Educational Resources Information Center (ERIC)	X			
Index Medicus (MEDLINE)				X
National Clearinghouse for Alcohol Information (NCALI)	X			
National Criminal Justice Reference Service, LEAA	X			
National Technical Information Service (NTIS)	X			
Military Medical Journals	X			
New York Times Information Bank (NYTIB)	X			
Social Sciences Citation Index (SSCI)			X	X
Technical Information on Projects System (TIPS) (includes all current and recently terminated projects funded by NIAAA, NIDA, NIMH)	X			

Appendix D. Frequently Used Libraries/Publication Lists

FREQUENTLY USED LIBRARIES

California State Traffic Library, Sacramento, California

Fire Library, University of California at Berkeley

Highway Safety Research Institute Library,
University of Michigan, Ann Arbor, Michigan

Institute for Industrial Relations Library,
University of California at Berkeley

Social Research Group Library, University of California at Berkeley

Survey Research Center Library, University of California at Berkeley

School of Public Health Library, University of California at Berkeley

Research Triangle Publication List

Appendix E - Report on National Fire Protection and Control Agency Data System

Encouraged by the National Fire Prevention and Control Agency a number of states have established statewide fire accident reporting systems. Currently California and Ohio have active systems. Oregon, New York and Michigan are to be added this year. The NFPCA Casualty and Accident reports are included in this appendix. Unfortunately the coding does not specify alcohol. In the two reports the alcohol related variables are as follows:

Casualty Report: "Condition before injury" (line X) has a code
"Impaired by drugs, alcohol"

"Conditions Preventing Escape" (line Y) has a
code "victim incapacitated prior to ignition"

"Activity at Time of Injury" (line Y) has a
code "unable to act"

The later two variables could be usefully analyzed for alcohol involvement if the condition before injury code were made more specific.

Incident Report: "Ignition Factor" (line L) has one code "misuse
of the Act of Ignition. - unconscious, mental,
physical, impairment, drug, alcohol stupor."

Fill In This Report
In Your Own Words

NFPCA CASUALTY REPORT

A	5	FD ID	Incident No.	Exp. No.	Mo.	Day	Year	Day of Week	Alarm Time
---	---	-------	--------------	----------	-----	-----	------	-------------	------------

Page
of

						Casualty Number	<input type="checkbox"/> Revised Report		
U	Casualty Last Name		First Name		MI	D.O.B.	Age	Time of Injury	
V	Home Address						Telephone		
W	SEX 1 <input type="checkbox"/> Male 2 <input type="checkbox"/> Female	CASUALTY TYPE 1 <input type="checkbox"/> Fire Casualty 2 <input type="checkbox"/> Action Casualty 3 <input type="checkbox"/> EMS Casualty	SEVERITY 1 <input type="checkbox"/> Injury 2 <input type="checkbox"/> Death	AFFILIATION 1 <input type="checkbox"/> Fire Service 2 <input type="checkbox"/> Other Emergency Personnel 3 <input type="checkbox"/> Civilian					
X	Familiarity With Structure		Location at Ignition		Condition Before Injury Impaired by drugs, alc. 3				
Y	Conditions Preventing Escape prior to Victim incapacitated ign. 7		Activity at Time of Injury Unable to act 7		Cause of Injury				
Z	Nature of Injury		Part of Body Injured		Disposition				
						<input type="checkbox"/> See Remarks on Back	<input type="checkbox"/> See Additional Report		

CASUALTY 1

						Casualty Number	<input type="checkbox"/> Revised Report		
U	Casualty Last Name		First Name		MI	D.O.B.	Age	Time of Injury	
V	Home Address						Telephone		
W	SEX 1 <input type="checkbox"/> Male 2 <input type="checkbox"/> Female	CASUALTY TYPE 1 <input type="checkbox"/> Fire Casualty 2 <input type="checkbox"/> Action Casualty 3 <input type="checkbox"/> EMS Casualty	SEVERITY 1 <input type="checkbox"/> Injury 2 <input type="checkbox"/> Death	AFFILIATION 1 <input type="checkbox"/> Fire Service 2 <input type="checkbox"/> Other Emergency Personnel 3 <input type="checkbox"/> Civilian					
X	Familiarity With Structure		Location at Ignition		Condition Before Injury				
Y	Conditions Preventing Escape		Activity at Time of Injury		Cause of Injury				
Z	Nature of Injury		Part of Body Injured		Disposition				
						<input type="checkbox"/> See Remarks on Back	<input type="checkbox"/> See Additional Report		

CASUALTY 2

						Casualty Number	<input type="checkbox"/> Revised Report		
U	Casualty Last Name		First Name		MI	D.O.B.	Age	Time of Injury	
V	Home Address						Telephone		
W	SEX 1 <input type="checkbox"/> Male 2 <input type="checkbox"/> Female	CASUALTY TYPE 1 <input type="checkbox"/> Fire Casualty 2 <input type="checkbox"/> Action Casualty 3 <input type="checkbox"/> EMS Casualty	SEVERITY 1 <input type="checkbox"/> Injury 2 <input type="checkbox"/> Death	AFFILIATION 1 <input type="checkbox"/> Fire Service 2 <input type="checkbox"/> Other Emergency Personnel 3 <input type="checkbox"/> Civilian					
X	Familiarity With Structure		Location at Ignition		Condition Before Injury				
Y	Conditions Preventing Escape		Activity at Time of Injury		Cause of Injury				
Z	Nature of Injury		Part of Body Injured		Disposition				
						<input type="checkbox"/> See Remarks on Back	<input type="checkbox"/> See Additional Report		

CASUALTY 3

Collected by the
National Fire Data System

R

Officer in Charge (Name, Position, Assignment)	Date
Member Making Report (If Different From Above)	Date

Fill In This Report
In Your Own Words

NFPCA INCIDENT REPORT

Revised Report

A	1	FD ID	Incident No.	Exp. No.	Mo.	Day	Year	Day of the Week	Alarm Time	Time-- "In Service"
B	CORRECT ADDRESS:		No.	Dir.	Name	Type	Zip Code	Census Tract		
C	Occupant Name					Telephone			Room or Apt.	
D	Owner Name				Address				Telephone	
E	Method of Alarm from Public					Type of Situation Found				
F	Type of Action Taken				Co. Inspection District	Shift	No. Alarms	Mutual Aid <input type="checkbox"/> Rec'd <input type="checkbox"/> Given		
G	No. Fire Service Personnel Used at Scene		No. Engines Used at Scene		No. Aerial Apparatus Used at Scene		No. Other Vehicles Used at Scene			

COMPLETE ON ALL INCIDENTS

H	2	No. Incident-related Injuries*		No. Incident-related Fatalities*		Structure Type			
I	Fire Service		Others		Fire Service		Others		
J	Fixed Property Use			Complex		Mobile Property Type**			
J	Area of Fire Origin		Level of Fire Origin		Construction Type		Construction Method		

COMPLETE IF CASUALTY OR FIRE

K	Equipment Involved in Ignition (if any)**				Form of Heat of Ignition				
L	Type of Material Ignited		Form of Material Ignited		Ignition Factor		Catch all includes alcohol		3, 7

IGNITION

M	Extent of Flame Damage	IF FLAME SPREAD BEYOND ROOM OF ORIGIN:	Type of Material Generating Most Flame		Avenue of Flame Travel	
N	Extent of Smoke Damage	IF SMOKE SPREAD BEYOND ROOM OF ORIGIN:	Type of Material Generating Most Smoke		Avenue of Smoke Travel	
O	Extent of Water Damage		Extent of Fire Control Damage		Termination Stage	

COMPLETE IF FIRE FIRE GROWTH

P	Time from Alarm to Agent Application		Method of Extinguishment			Detector Performance	
Q	Estimated Total Dollar Loss		Property Damage Classification			Sprinkler Performance	

COMBAT

✓ Collected by the National Fire Data System

* List name, age, sex, and description of injury for each casualty on form 902G.

** Complete Line S and/or T

Check box if remarks are made on reverse side.

R	Officer in Charge (Name, Position, Assignment)					Date	
	Member Making Report (If Different from Above)					Date	
S	3	If Mobile Property	Year	Make	Model	Serial No.	License No. (If any)
T	4	If Equipment Involved in Ignition	Year	Make	Model	Serial No.	Voltage (if any)

COMPLETE ON ALL

Appendix F - Samples of Reporting Forms

The following casualty reporting forms are used by agencies as well as researchers. The alcohol specific items are marked. Forms used or discussed in a published article are marked with the author and year of the study. See bibliography for full citation.

7/16/76

8020.11
Appendix 2

c. Sample Accident/Incident Record, FAA Form 8020-5

Reports Identification Symbol: FS 8020-27

A GENERAL IDENTIFICATION						ACCIDENT/INCIDENT RECORD					
1. CATEGORY <input type="checkbox"/> GENERAL AVIATION <input type="checkbox"/> AIR CARRIER		2. AGENCY AIRCRAFT <input type="checkbox"/> OWNED <input type="checkbox"/> RENTED		3. TYPE OCCURENCE <input type="checkbox"/> ACCIDENT <input type="checkbox"/> INCIDENT							
4. AIRCRAFT MAKE AND MODEL		5. REGISTRATION MARK		6. LOCATION OF ACCIDENT (City and State)							
7. NAME OF OPERATOR			8. ADDRESS OF OPERATOR			9. DATE		10. TIME (Local)			
B NARRATIVE EXPLANATIONS—REMARKS											
<div style="font-size: 4em; transform: rotate(-45deg); opacity: 0.5;">SAMPLE</div>											
(Continue on additional sheet)											
C PERSONS INVOLVED						D. DAMAGE					
		1. PASSENGER	2. FLT. CREW	3. CABIN CREW	4. GND. CREW	5. PUBLIC	6. TOTAL				
ABOARD								1. Minor	YES/NO		
INJURED								2. Substantial			
DECEASED								3. Demolished			
								4. Fire After Impact			
								5. Property Damage			
								6.			
E AIRCRAFT OPERATION											
1. TYPE OF OPERATION		2. FLT. NO.		3. OPERATION CONDUCTED UNDER FAR PART:		4. PHASE OF FLIGHT		GROUND TAXI	TAKE OFF CLIMB	LEVEL FLT. DESCENT	APPROACH LANDING
F AIRPORT											
1. NAME OF AIRPORT			2. RUNWAY NO.		3. RUNWAY LENGTH		4. ELEVATION		5. RUNWAY TEMP.		
6. REMARKS (Condition of runway—ice, snow, water, lighting, etc.)											
G WEATHER											
1. STATION		2. TIME	3. SKY CONDITION		4. VIS.	5. RESTRICTIONS TO VIS.		6. TEMP.	7. D. P.	8. WIND.	9. ALSTG.
10. REMARKS (Signets, adisorys, pipeps, turbulence, trends, etc.)											
H AIR TRAFFIC											
1. CONTROL/COMMUNICATION FACILITY			2. CLEARANCE/FLT. PLAN			3. TYPE OF APPROACH					
TOWER		CENTER	FSS	IFR	NONE	ILS FRONT		VOR	VOR/DME	PAR	
OTHER (Explain)		UNICOM	NONE	VFR	NONE	ILS BACK		ADF	ASR	VISUAL	
4. RADAR		5. DEPARTED		DESTINATION							
IN AREA OF COVERAGE		YES	NO	FOR		AT		Z			
UNDER CONTROL		6. LAST COMMUNICATION (Position, time, altitude)									

I CREW HISTORY																			
1. PILOT IN CONTROL <input type="checkbox"/> PIC <input type="checkbox"/> SIC			2. SEAT OCCUPIED <input type="checkbox"/> LEFT <input type="checkbox"/> RIGHT			3. NAME OF VIP, FAA OR NEWSWORTHY ABOARD													
4A. NAME OF PILOT-IN-COMMAND				B. DATE OF BIRTH		5A. NAME OF SECOND-IN-COMMAND			B. DATE OF BIRTH										
C. DOMICILE (City and State)						C. DOMICILE (City and State)													
D. CERTIFICATE—GRADE, NUMBER, AND RATING						D. CERTIFICATE—GRADE, NUMBER, AND RATING													
E. TOTAL TIME		F. TIME IN EQUIP.		G. MEDICAL—CLASS, DATE		E. TOTAL TIME		F. TIME IN EQUIP.		G. MEDICAL—CLASS, DATE									
H. PROFIC. CHECK—DATE		I. LINE CHECK—DATE		J. DUTY TIME—24 HRS.		H. PROFIC. CHECK—DATE		I. LINE CHECK—DATE		J. DUTY TIME—24 HRS.									
J FACTORS INVOLVED																			
<i>(Check applicable box)</i>				YES		NO		<i>(Check applicable box)</i>				YES		NO					
TAKEOFF/LANDING				COLLISION				CONTROL AFFECTED											
1. Unscheduled landing				18. Near midair				32. Inflight (Incl. taxi-off & landing)											
2. Forced/emergency landing				19. Midair between aircraft				33. Ground											
3. Landed short of runway—500 feet or LESS				20. Midair with obstruction				34. Off taxiway/ramp while taxiing											
4. Landed short of runway—500 feet or MORE				21. Ground—Aircraft, other object, person				35. Unable/unsafe to taxi (Incl. pins, tow, etc.)											
5. Landed on wrong airport				22. Bird(s)				MISCELLANEOUS											
6. Landed on wrong runway				23. Explosive decompression				36. Structural failure											
7. Overran departure end of runway				24. Rapid decompression				37. Loss/separation of part(s)											
8. Off side of runway				25. Uncontrollable cabin pressure/temperature				38. Cargo containment/restraint											
9. Rejected takeoff				26. Passengers oxygen masks not used				39. Lightning strike											
10. Mercy landing (Sick passeng. crew)				27. Captured/pierced (Prop, turbine, etc.)				40. Turbulence											
EMERGENCIES				FIRE				41. Powerplant shutdown											
11. Declared				28. Inflight				42. Non-routine pass. off loading											
12. Descent				29. Ground (Refueling, APU, etc.)				43. Crew member incapacitation											
13. Collision avoidance maneuver				30. Smoke/fumes in cockpit or cabin				44. Runway blocked											
14. Evacuation				31. Fire warning				45. Air security (hit/miss, bomb threat, sabotage, etc.)											
15. Fire and rescue—alert								46. Public protection											
16. Fire and rescue—action								47. Passenger disturbance (Unruly passenger, etc.)											
17. Other emergency/alternate/Abnormal action (Specify)								48. Public complaint (Noise, low flying, etc.)											
								49. Parachute incident											
K MALFUNCTIONS/FAILURES																			
<i>(Check applicable box)</i>						YES		NO		<i>(Check applicable box)</i>						YES		NO	
1. Flight controls						8. Communications													
2. Lift/drag devices						9. Propulsion (Engine, props, fuel, reversers, etc.)													
3. Flight instruments (Alt., air speed, gyro, etc.)						10. Hydraulic system													
4. Other instruments/gages (Press., temp., qty., etc.)						11. Landing gear (Wheels, brakes, tires, doors, etc.)													
5. Other indicators (Gear, doors, burn, lights, etc.)						12. Electrical system													
6. Emergency equip. (Exit, slides, oxygen, extinguishers, etc.)						13. Pressurization system													
7. Navigation systems						14. Other (Specify)													
15. Components involved (Engine make and model, part name and numbers)																			
L INVESTIGATION																			
1. NTSB NOTIFIED <input type="checkbox"/> YES <input type="checkbox"/> NO			2. RECORDER REVIEW A. FLIGHT <input type="checkbox"/> YES <input type="checkbox"/> NO B. VOICE <input type="checkbox"/> YES <input type="checkbox"/> NO			3. EXTENT OF INVESTIGATION <input type="checkbox"/> OFFICE <input type="checkbox"/> SCENE			4. SOURCE OF INFORMATION <input type="checkbox"/> ATC <input type="checkbox"/> OPERATOR <input type="checkbox"/> SURVEILLANCE <input type="checkbox"/> OTHER (Specify)										
5. RELATED REPORTS <input type="checkbox"/> MPR <input type="checkbox"/> M OR D <input type="checkbox"/> OTHER (Specify) <input type="checkbox"/> NONE						6. NTSB INVESTIGATOR			7. FAA COORD./INVESTIGATOR										
M DISPOSITION																			
1. REPORT SUBMITTED BY (Signature)				2. OFFICE		3. DATE		4. RECEIVED IN FS-50 TIME _____ INIT _____				DISTRIBUTION OF REPORT							

(reverse of FAA Form 8020-5)

g. Sample Factual Aircraft Accident Report - General Aviation,
NTSB Form 6120.4, Page 1

NATIONAL TRANSPORTATION SAFETY BOARD FACTUAL AIRCRAFT ACCIDENT REPORT - GENERAL AVIATION -		NTSB FORM 6120.1 SUBMITTED <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES	NTSB ACCIDENT IDENT. NO.					
DISTANCE AND DIRECTION FROM NEAREST CITY OR PLACE, STATE 3 miles east of Airville, Arkansas		REGISTRATION MARK N 1234A	DATE OF ACCIDENT 02-05-75					
ELEVATION 350 MSL		TIME (Local) 1232	TIME ZONE c.s.t.					
Part A - WHEN ACCIDENT OCCURRED DURING APPROACH TO OR DEPARTURE FROM AN AIRPORT - COMPLETE FOLLOWING:								
AIRPORT NAME Airville Mun.	RUNWAY IN USE DIRECTION: 040 °MAG. LENGTH: 7,000 FT.	ON AIRPORT <input type="checkbox"/> OFF AIRPORT <input checked="" type="checkbox"/>	FROM AIRPORT DEGREES: 215 MILES: 1/4	RUNWAY SURFACE TYPE: Concrete CONDITION: wet				
Part B - AIRCRAFT DATA								
AIRCRAFT MAKE AND MODEL Beechcraft S35	SERIAL NO. V-111	AIRCRAFT TOTAL TIME 1,435 hrs.	DATE LAST ANNUAL OR PROGRESSIVE INSP. 12-14-74	TIME SINCE ANNUAL OR PROGRESSIVE INSP. 65 hours				
ENGINE MAKE AND MODEL Cont. IO-520-B	ENGINE TOTAL TIME/TIME SINCE O.H. NO. 1 650 hrs, N/A NO. 2 /		TIME SINCE LAST 100 HOUR INSPECTION 65 hours					
NAME AND ADDRESS OF OWNER OR OPERATOR R. L. Smith 100 Main Street, Airville, Ark.			CATEGORY OF AIRWORTHINESS CERTIFICATE Standard					
PURPOSE AND TYPE OF OPERATION (Check all applicable boxes)								
<input type="checkbox"/> LOCAL <input type="checkbox"/> SCHEDULE <input type="checkbox"/> PASSENGER <input type="checkbox"/> PRACTICE <input type="checkbox"/> _____ <input checked="" type="checkbox"/> PLEASURE <input type="checkbox"/> MAIL <input type="checkbox"/> BUSINESS <input type="checkbox"/> INSTRUCTIONAL <input type="checkbox"/> AIR TAXI <input type="checkbox"/> CARGO <input type="checkbox"/> CORP./EXEC. <input type="checkbox"/> AERIAL APPLICATION								
Part C - PILOT-IN-COMMAND DATA								
NAME AND ADDRESS R. L. Smith 100 Main St. Airville, Ark.		SEAT OCCUPIED left front	PILOT CERTIFICATE NO. 000000					
		DEGREE OF INJURY Serious	SOCIAL SECURITY NO. Not used					
		OCCUPATION Contractor	NATIONALITY USA					
<input type="checkbox"/> AIRLINE TRANSPORT <input type="checkbox"/> AIRPLANE <input type="checkbox"/> COMMERCIAL <input type="checkbox"/> HELICOPTER <input type="checkbox"/> FLT. INSTRUCTOR <input type="checkbox"/> ROTORCRAFT <input checked="" type="checkbox"/> PRIVATE <input type="checkbox"/> GYROPLANE <input type="checkbox"/> STUDENT <input type="checkbox"/> GLIDER <input type="checkbox"/> OTHER <input type="checkbox"/> INSTRUMENT		TYPE RATINGS OR STUDENT ENDORSEMENTS AUTOPSY: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES TOXICOLOGY: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES	MEDICAL CERTIFICATE DATE OF ISSUE: 10/24/74 CLASS: Third LIMITATIONS/EXEMPTIONS: Must wear corrective glasses for distant vision					
<input type="checkbox"/> MULTI-ENGINE: LAND <input type="checkbox"/> SEA <input type="checkbox"/> <input checked="" type="checkbox"/> SINGLE-ENGINE: LAND <input checked="" type="checkbox"/> SEA <input type="checkbox"/>		DATE OF BIRTH 10-11-25						
PILOT TIME		LAST 24 HOURS		LAST 90 DAYS		TOTAL TO DATE		
		DUAL	PIC	DUAL	PIC	DUAL	PIC	TOTAL
1. THIS MAKE AND MODEL			5	15	15	250	300	550
2. NIGHT (All Models)				2	2	10	25	35
3. DAY (All Models)			5	15	15	300	350	650
4. INSTRUMENTS		ACTUAL		SIMULATED				
						2	5	7
						10	6	16
SOURCE OF TIME <input checked="" type="checkbox"/> PILOT FLIGHT LOG <input type="checkbox"/> PILOT/OPERATOR EST. <input type="checkbox"/> FAA RECORD <input type="checkbox"/> OTHER (Specify)		5. SINGLE ENG. FIXED WING		6. MULTI-ENG. FIXED WING		7. GLIDER		
		8. ROTORCRAFT		9. OTHER:				
		TOTAL FLIGHT TIME (5, 6, 7, 8, 9)						650

NEW FORM

DEPARTMENT OF TRANSPORTATION U. S. COAST CG-1365 (Rev. 5-75)		BOATING ACCIDENT REPORT		FORM APPROVED OMB No. 04-23012	
<p>The operator of every vessel involved is required to file a report in writing whenever a boating accident results in loss of life, loss of consciousness, medical treatment or disability in excess of 24 hours or property damage in excess of \$100. Reports in death and injury cases must be submitted within 48 hours. Reports in other cases are required within 5 days. All reports must be submitted (a) to the state where the vessel number is issued (b) if the vessel has no number, where the vessel is principally used (c) the state where the casualty or accident occurs, if it occurred outside the state where the vessel is numbered or the place where the accident occurred. See addresses on reverse.</p>					
COMPLETE ALL BLOCKS (Indicate those not applicable by "NA")					
NAME AND ADDRESS OF OPERATOR		AGE	OPERATOR'S EXPERIENCE		
OPERATOR TELEPHONE NO.		OWNER TELE. NO.	THIS TYPE OF BOAT <input type="checkbox"/> UNDER 20 HOURS <input type="checkbox"/> UNDER 20 HOURS EXP <input type="checkbox"/> 20 TO 100 HOURS <input type="checkbox"/> 20 TO 100 HOURS <input type="checkbox"/> 100 TO 500 HOURS <input type="checkbox"/> 100 TO 500 HOURS <input type="checkbox"/> OVER 500 HOURS <input type="checkbox"/> OVER 500 HOURS		
NAME AND ADDRESS OF OWNER		RENTED BOAT <input type="checkbox"/> YES <input type="checkbox"/> NO	NO. OF PERSONS ON BOARD	FORMAL INSTRUCTIONS IN BOATING SAFETY <input type="checkbox"/> NONE <input type="checkbox"/> USCG AUXILIARY <input type="checkbox"/> U.S. POWER SQUADRON <input type="checkbox"/> AMERICAN RED CROSS <input type="checkbox"/> STATE <input type="checkbox"/> OTHER (Indicate)	
VESSEL NO. 1					
BOAT NUMBER	BOAT NAME	BOAT MAKE	BOAT MODEL	NPR HULL IDENTIFICATION NO.	
TYPE OF BOAT <input type="checkbox"/> OPEN MOTORBOAT <input type="checkbox"/> CABIN MOTORBOAT <input type="checkbox"/> AUXILIARY SAIL <input type="checkbox"/> SAIL (ONLY) <input type="checkbox"/> ROWBOAT <input type="checkbox"/> OTHER (Specify)	HULL MATERIAL <input type="checkbox"/> WOOD <input type="checkbox"/> ALUMINUM <input type="checkbox"/> STEEL <input type="checkbox"/> FIBERGLASS (Plastic) <input type="checkbox"/> OTHER (Specify)	ENGINE <input type="checkbox"/> OUTBOARD <input type="checkbox"/> INBOARD GASOLINE <input type="checkbox"/> INBOARD DIESEL <input type="checkbox"/> INBOARD-OUTDRIVE <input type="checkbox"/> OTHER (Specify)	BOAT DATA (Propulsion) NO. OF ENGINES MAKE OF ENGINE HORSEPOWER (Total) YEAR BUILT (Engine) TYPE OF FUEL	BOAT DATA (Construction) LENGTH WIDTH BEAM DEPTH (From Transom To Keel) YEAR BUILT (Hull)	
ACCIDENT DATA					
DATE OF ACCIDENT	TIME AM PM	NAME OF BODY OF WATER		LOCATION (Give location precisely)	
STATE	NEAREST CITY OR TOWN		COUNTY		
WEATHER	WATER CONDITIONS		TEMPERATURES (Estimate)	WIND	VISIBILITY
<input type="checkbox"/> CLEAR <input type="checkbox"/> RAIN <input type="checkbox"/> CLOUDY <input type="checkbox"/> SNOW <input type="checkbox"/> FOG <input type="checkbox"/> HAZY	<input type="checkbox"/> CALM <input type="checkbox"/> CHOPPY <input type="checkbox"/> ROUGH <input type="checkbox"/> VERY ROUGH <input type="checkbox"/> STRONG CURRENT		AIR _____ ° WATER _____ °	<input type="checkbox"/> NONE <input type="checkbox"/> LIGHT (7-16 MPH) <input type="checkbox"/> MODERATE (17-24 MPH) <input type="checkbox"/> STRONG (25-33 MPH) <input type="checkbox"/> STORM (Over 33 MPH)	<input type="checkbox"/> GOOD <input type="checkbox"/> FAIR <input type="checkbox"/> POOR
OPERATION AT TIME OF ACCIDENT (Check all applicable)		TYPE OF ACCIDENT		WHAT, IN YOUR OPINION, CAUSED THE ACCIDENT	
<input type="checkbox"/> CRUISING <input type="checkbox"/> AT ANCHOR <input type="checkbox"/> APPROACHING DOCK <input type="checkbox"/> TIED TO DOCK <input type="checkbox"/> WATER SKIING <input type="checkbox"/> FUELING <input type="checkbox"/> RACING <input type="checkbox"/> FISHING <input type="checkbox"/> TOWING <input type="checkbox"/> HUNTING <input type="checkbox"/> BEING TOWED <input type="checkbox"/> SKIN DIVING OR SWIMMING <input type="checkbox"/> DRIFTING <input type="checkbox"/> OTHER (Specify)		<input type="checkbox"/> GROUNDING <input type="checkbox"/> COLLISION WITH FIXED OBJECT <input type="checkbox"/> CAPSIZING <input type="checkbox"/> COLLISION WITH FLOATING OBJECT <input type="checkbox"/> FLOODING <input type="checkbox"/> FALLS OVERBOARD <input type="checkbox"/> SINKING <input type="checkbox"/> FALLS IN BOAT <input type="checkbox"/> FIRE OR EXPLOSION (Fuel) <input type="checkbox"/> FALLS IN BOAT <input type="checkbox"/> FIRE OR EXPLOSION (Other than fuel) <input type="checkbox"/> BURNS <input type="checkbox"/> COLLISION WITH VESSEL <input type="checkbox"/> HIT BY BOAT OR PROPELLER <input type="checkbox"/> OTHER (Specify)		<input type="checkbox"/> WEATHER CONDITIONS <input type="checkbox"/> FAULT OF HULL <input type="checkbox"/> EXCESSIVE SPEED <input type="checkbox"/> FAULT OF MACHINERY <input type="checkbox"/> NO PROPER LOCKOUT <input type="checkbox"/> FAULT OF EQUIPMENT <input type="checkbox"/> OVERLOADING <input type="checkbox"/> OTHER (Specify) <input type="checkbox"/> IMPROPER LOADING <input type="checkbox"/> HAZARDOUS WATERS <input type="checkbox"/> RESTRICTED VISION	
PERSONAL FLOTATION DEVICES			FIRE EXTINGUISHERS		
WAS THE BOAT ADEQUATELY EQUIPPED WITH CG APPROVED LIFESAVING DEVICES? <input type="checkbox"/> YES <input type="checkbox"/> NO WERE THEY ACCESSIBLE <input type="checkbox"/> YES <input type="checkbox"/> NO WERE THEY USED <input type="checkbox"/> YES <input type="checkbox"/> NO		WAS THE VESSEL CARRYING NON-APPROVED LIFESAVING DEVICES? <input type="checkbox"/> YES <input type="checkbox"/> NO WERE THEY ACCESSIBLE <input type="checkbox"/> YES <input type="checkbox"/> NO WERE THEY USED <input type="checkbox"/> YES <input type="checkbox"/> NO		WERE THEY USED (If yes, list type(s) and number used) <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT APPLICABLE	
PROPERTY DAMAGE (Est.)	DESCRIBE PROPERTY DAMAGE				
THIS BOAT \$ OTHER BOAT \$ OTHER PROPERTIES \$	NAME AND ADDRESS OF OWNER (Damaged Property)				
DECEASED					
NAME	ADDRESS	DATE OF BIRTH	WAS VICTIM <input type="checkbox"/> SWIMMER <input type="checkbox"/> NON-SWIMMER	DEATH CAUSED BY <input type="checkbox"/> DROWNING <input type="checkbox"/> DISAPPEARANCE <input type="checkbox"/> OTHER	
NAME	ADDRESS	DATE OF BIRTH	WAS VICTIM <input type="checkbox"/> SWIMMER <input type="checkbox"/> NON-SWIMMER	DEATH CAUSED BY <input type="checkbox"/> DROWNING <input type="checkbox"/> DISAPPEARANCE <input type="checkbox"/> OTHER	
NAME	ADDRESS	DATE OF BIRTH	WAS VICTIM <input type="checkbox"/> SWIMMER <input type="checkbox"/> NON-SWIMMER	DEATH CAUSED BY <input type="checkbox"/> DROWNING <input type="checkbox"/> DISAPPEARANCE <input type="checkbox"/> OTHER	
INJURED					
NAME	ADDRESS	DATE OF BIRTH	NATURE OF INJURY	INCAPACITATED OVER 24 HOURS <input type="checkbox"/> YES <input type="checkbox"/> NO	
NAME	ADDRESS	DATE OF BIRTH	NATURE OF INJURY	INCAPACITATED OVER 24 HOURS <input type="checkbox"/> YES <input type="checkbox"/> NO	
NAME	ADDRESS	DATE OF BIRTH	NATURE OF INJURY	INCAPACITATED OVER 24 HOURS <input type="checkbox"/> YES <input type="checkbox"/> NO	

PREVIOUS EDITIONS ARE OBSOLETE

Reverse of CG-1449 (Rev. 5-75)

ACCIDENT DESCRIPTION		
DESCRIBE WHAT HAPPENED (Sequence of events. Include Failure of Equipment. If diagram is needed attach separately. Continue on additional sheets if necessary.)		
VESSEL NO. 2		
NAME OF OPERATOR	ADDRESS	BOAT NUMBER
TELEPHONE NUMBER		BOAT NAME
NAME OF OWNER	ADDRESS	
WITNESSES		
NAME	ADDRESS	TELEPHONE NUMBER
NAME	ADDRESS	TELEPHONE NUMBER
NAME	ADDRESS	TELEPHONE NUMBER
PERSON COMPLETING REPORT		
SIGNATURE	ADDRESS	DATE SUBMITTED
QUALIFICATION (Check one) <input type="checkbox"/> OPERATOR <input type="checkbox"/> OWNER <input type="checkbox"/> INVESTIGATOR <input type="checkbox"/> OTHER		TELEPHONE
(do not use) - FOR REPORTING AUTHORITY REVIEW (use agency date stamp)		
NAME OF REVIEWING OFFICE	DATE RECEIVED	CAUSES BASED ON (Check one) <input type="checkbox"/> THIS REPORT <input type="checkbox"/> INVESTIGATION AND THIS REPORT <input type="checkbox"/> INVESTIGATION <input type="checkbox"/> COULD NOT BE DETERMINED
PRIMARY CAUSE OF ACCIDENT		REVIEWED BY
SECONDARY CAUSE OF ACCIDENT		
STATE BOATING LAW ADMINISTRATORS		
<p>Dept. of Cons. & Nat'l Res. - Water Safety Div. Administrative Building Montgomery, AL. 36104</p> <p>Commission of Public Safety Pouch "N" Capitol Building Juneau, AK. 99901</p> <p>Government of American Samoa Pago Pago, AS. 96910</p> <p>Arizona Game and Fish Department 222 W. Greenway Road Phoenix, AZ. 85023</p> <p>Arkansas Game and Commission State Capitol Grounds Little Rock, AR. 72201</p> <p>Dept. of Navigation & Coastal Development 1416 Trinity Street Sacramento, CA. 95814</p> <p>Division of Park & Outdoor Recreation 1945 Sherman Denver, CO. 80203</p> <p>Boating Div. - Dept. of Environmental Protection State Office Building Hartford, CT. 06115</p> <p>Dept. of Nat'l Resources & Environmental Comm. D Street Dover, DE. 19901</p> <p>Metropolitan Police Dept. - Harbor Section, 500 850 Waterfront Street, S.W. Washington, D. C. 20020</p> <p>Dept. of Natural Resources Larson Building Tallahassee, FL. 82304</p> <p>Game & Fish Div. - Dept. of Nat'l Resources Room 707-C, Trinity - Washington Building Atlanta, GA. 30334</p> <p>Dept. of Public Safety Agana, GU. 96910</p> <p>Dept. of Transportation - Harbor Division 79 S. Nimitz Highway Honolulu, HI. 96813</p> <p>Dept. of Law Enforcement P.O. Box 34 Boise, ID. 83731</p> <p>Conservation Department 400 South Spring Street Springfield, IL. 62706</p> <p>Dept. of Wildlife Resources 604 State Office Building Indianapolis, IN. 46204</p> <p>State Conservation Commission 300 Fourth Street Des Moines, IA. 50319</p> <p>Forestry, Fish & Game Commission Box 1028 Pratt, KA. 67124</p>	<p>Division of Water Enforcement Frankfort, KY. 40601</p> <p>Wildlife & Fisheries Commission 400 Royal Street New Orleans, LA. 70130</p> <p>Bureau of Watercraft Reg. and Safety State Office Building Augusta, ME. 04330</p> <p>Natural Resources Police Tampa State Building Annapolis, MD. 21401</p> <p>Marine & Recreational Vehicles 64 Causeway Street Boston, MA. 02114</p> <p>Michigan Dept. of State Police 714 S. Harrison Road Lansing, MI. 48933</p> <p>Dept. of Natural Resources Centennial Office Building St. Paul, MN. 55155</p> <p>Boat & Water Safety Commission Room 403, Robert E. Lee Bldg. Jackson, MS. 39201</p> <p>Division of Water Safety P.O. Box 603 Jefferson City, MO. 65101</p> <p>Enforcement Div. - Dept. of Fish & Game Helena, MT. 59601</p> <p>State Game and Parks Commission 1220 North Third Street Lincoln, NE. 68503</p> <p>Fish and Game Department P.O. Box 10679 Reno, NV. 89510</p> <p>Department of Safety Concord, NH. 03301</p> <p>Dept. of Environmental Protection Division of Marine Services P.O. Box 1889 Trenton, NJ. 08625</p> <p>Park and Recreation Commission P.O. Box 1147 Santa Fe, NM. 87501</p> <p>State Park & Recreation South Swan Street, Bldg. - South Hill Albany, NY. 12223</p> <p>Wildlife Resources Commission Raleigh, NC. 27611</p> <p>State Game and Fish Department Bismarck, ND. 58501</p> <p>Dept. of Natural Resources Fountain Square Columbus, OH. 43224</p>	<p>Dept. of Public Safety P.O. Box 11415 Oklahoma City, OK. 73111</p> <p>Oregon Marine Board Director 1000 Market Street, P.E. #505 Salem, OR. 97310</p> <p>State Fish Commission P.O. Box 1627 Harrisburg, PA. 17120</p> <p>Operation Division Marine Department Puerto Rico Authority GPO Box 2319 San Juan, PR. 00935</p> <p>Division of Boating Safety Oposset Administration Building Davisville, RI. 02854</p> <p>Division of Boating P.O. Box 12559, Ft. Johnson Road Charleston, SC. 29412</p> <p>Dept. of Game, Fish and Parks State Office Building Pierre, SD. 57501</p> <p>Wildlife Resources Agency Ellington Agriculture Center P.O. Box 40707 Nashville, TN. 37204</p> <p>Parks and Wildlife Department John Reagan Building Austin, TX. 78701</p> <p>Division of Parks and Recreation 1526 W. North Temple Street Salt Lake City, UT. 84116</p> <p>Marine Division Department of Public Safety Montpelier, VT. 05402</p> <p>Charlotte Amalie St. Thomas, VI. 00801</p> <p>Commission of Game & Inland Fisheries P.O. Box 11104 Richmond, VA. 23210</p> <p>Boat & Water Safety Washington State Park & Recreation P.O. Box 1129 Olympia, WA. 98504</p> <p>Dept. of Natural Resources Charleston, WV. 25305</p> <p>Dept. of Natural Resources P.O. Box 450 Madison, WI. 53701</p> <p>Game & Fish Department P.O. Box 1529 Cheyenne, WY. 82001</p>



Ministry of the
Solicitor
General

Office of
the Fire
Marshal

590 Keele Street
Toronto, Ontario
M6N 4X2

634

Fire Casualty Report

Casualty
name

Address

Page no.

(132) Incident no.

	location	year	month	day	hour	minute	
1							13

Record type

14 B

Report status (Fire Marshal use)

15

(132) Casualty number

16 18

(132) Age

19 21

(132) Sex

22

(132) Status

23

(132) Condition of casualty

24 25 (Impaired by Alcohol)

(133) Action of casualty

26 27

(133) Ignition of clothing or other fabric

28 29

(133) Type of fabric or material ignited

30 31

(133) Cause of failure to escape

32 33

(133) Date of death (if applicable)

	year	month	day	
34				39

Remarks

Date

----- 19 ----- Signed -----

Chief of Fire Dept.

Instructions

Do you require a new supply of this form? yes How many? (one year supply) -----

Complete a Fire Casualty Report for each victim.
Enter same Incident number on every Fire Casualty Report as on related Fire Report.
Retain white copy for your records — send pink copy to the above address.

...submitted from a moving motor vehicle collision

Owner Owner-occupant Occupant

Casualty yes

Incident Number location year month day hour minute 13

Suspected crime yes

No-alarm fire yes

Name Family name Given name initials 14 29 31 45

or Company Name Company name 14 45

Address of Fire Street name 46 56 57 A=Avenue D=Drive S=Street E=East W=West B=Boulevard L=Lane X=Other N=North S=South C=Crescent R=Road 58

Street or lot # 59 62 Apt. # or Concess. # 63 66 67 City-town or township 79 80 2

- Record type 14 A (80) Inter. fire protn. 33 (93) Extinguishment 45
Report status (F.M. use) 15 (81) Last inspected 34 (95) Level of origin 47
(2) Day of week 16 (82) Sprinkler protection 35 (96) Extent of fire 48
(3) Property complex 17 (83) A.F.D.S. 36 (97) Extent of damage 49
(4 or 45) Property class. 19 (84) Outside fire protn. 37 (98 or Area of origin 103) 50
(72) Property type 22 (85) Water supply-flow 38 (107) Occupant of area 52
(73) Property management 23 (86) Size of water main 39 (108) Source of ignition 53
(74) General construction 24 (87) Fire service 40 (117) Fuel or energy 55
(75) Building height 25 (90) Alarm to F.D. 41 (118) Form of heat 56
(76) Ground floor area 27 (91) Incident 42 (119 or Matl first ignited 125) 57
(77) Building capacity 28 (92) Action taken 44 (129) Act or omission; (alcohol, drugs...) 59
(78) Property value 29 (130A) Response time 61
(79) Year of const. 30

Estimated Dollar Loss (131) 64 71 80 1

Insurance coverage? yes no (if available) Name of insurance co.

Remarks

Fire dept. Mailing Address Tel. #

Date 19 Signed Chief of Fire Dept.

Northern California Burn Council, Inc.

BURN REGISTRY REPORT FORM

Deceased

#B _____

Date of Burn _____

Address _____

Admit Date _____

Time of Burn _____ am _____ pm

Release Date _____

Date of Birth _____

Medicare Medi-Cal Work Comp

M F

Marital Status: Mar Sing

Ethnic Background _____

Div Sep Child

Type of Burn: Flame ___ Scald ___ Electrical ___ Contact ___ Chemical ___ Flam. Lig ___

Other (specify) _____

Smoke Inhalation? Yes No

Severity of Burn: % of Degree; 1st ___ 2nd ___ 3rd ___ 4th ___, Face? ___ Hands? ___

Where Burn Happened: Indoors (what room?) _____

Outdoors (where?) _____

Chronic Disorder? Disabled ___ ETOH Drugs ___ Psychiatric ___ Other _____

Child Abuse? Suicide Attempt?

Fabric Ignited? (describe) _____

Patient Burned Before? Yes No

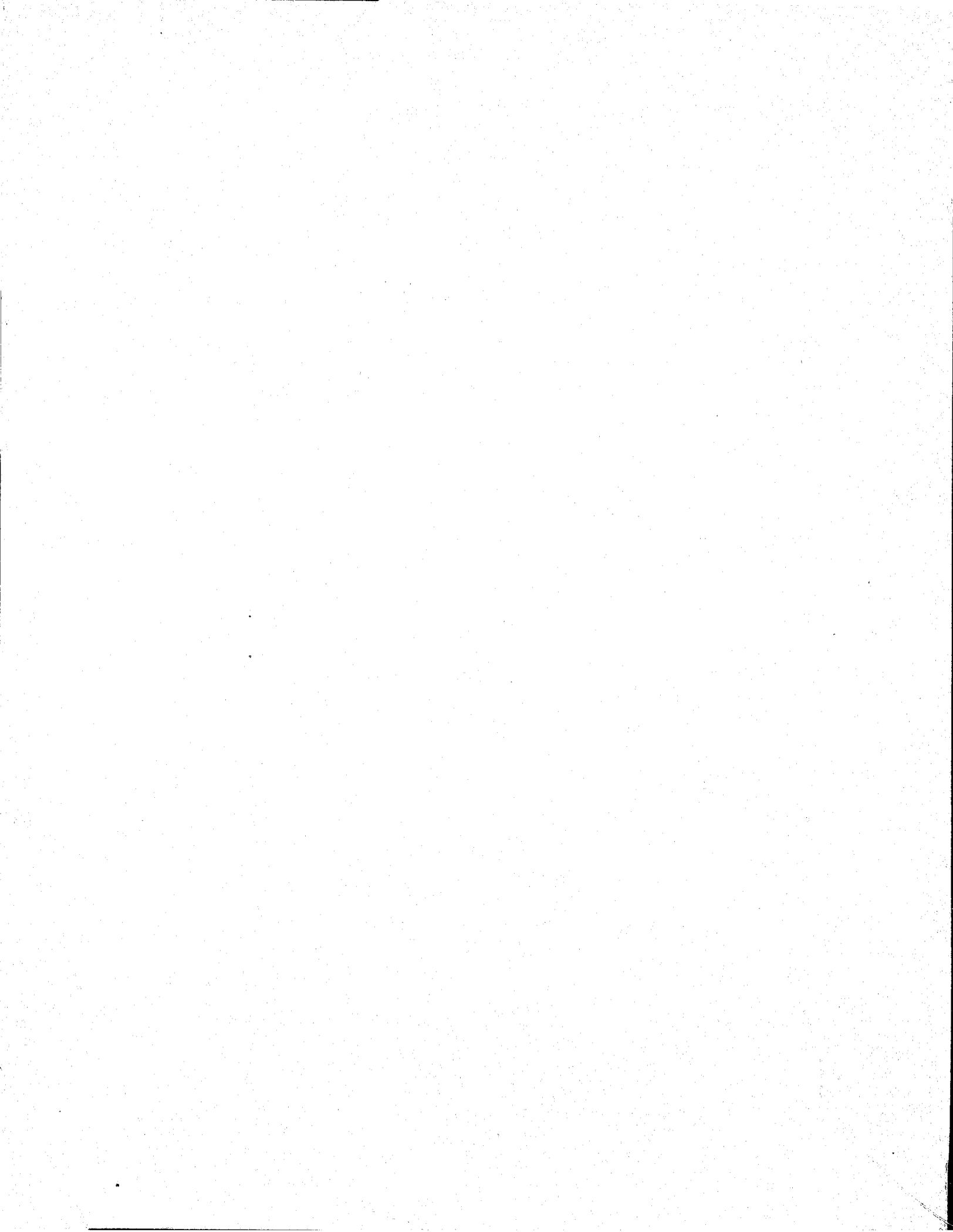
Patient transferred to other hospital? Yes No

Patient transferred from other hospital? Yes No

How Accident Occurred? _____

SAN FRANCISCO GENERAL HOSPITAL
Department of Surgery
San Francisco, California 94110
(415) 565-3314

ANDREW McGUIRE
Executive Director



Sample Fire Fatality Case

VICTIM, PERSONAL DATA

NAME Doe, Jane AGE 46 SEX F RACE W
 MARITAL STATUS M EDUCATION College INCOME Middle
 MEDICAL HISTORY N.A. OCCUPATION School teacher

SCENE REPORT

CASUALTIES 3 FATAL 2 SMOKE/GAS 1 BURN 1 OTHER 0
 CIVILIANS 2 FIREMAN 1

ESCAPES 2 AGES 14, 48

PATIENT DISPOSITION Dead at scene

RESUSCITATION ATTEMPT 10 MINUTES ESCAPE ATTEMPT Y

VICTIM LOCATION Bedroom, rear, near window

CONTRIBUTING FACTORS

HANDICAPPED <u>---</u>	BLOCKED EXITS <u>---</u>
MEDICATED <u>---</u>	TRAPPED <u>X</u>
INTOXICATED <u>X</u>	PANIC <u>---</u>
ASLEEP <u>---</u>	REENTERING <u>---</u>
OTHER <u>---</u>	OTHER <u>---</u>

FIRE DATA

CAUSE Smoking in bed

INITIAL MATERIAL IGNITED Mattress and bedding

MATERIAL BURNED Mattress and bedding, bed
 AND ORDER bedroom furnishings

SAMPLES Y WHAT Soot, mattress, rug

LOCATION Bedroom, rear

EXTENT Bedroom, bathroom

SPREAD FACTOR Bedroom furnishings

OCCUPANCY

RESIDENCE --- APARTMENT X OTHER ---

TYPE Garden

NUMBER OF FLOORS 2 TYPE OF HEATING Gas

TYPE OF CONSTRUCTION Brick and frame

NUMBER APTS/FLOOR 2 NUMBER OF EXIT DOORS 1

FIRE FLOOR 1 VICTIM FLOOR 1

BUILDING MATERIALS

EXTERIOR Brick veneer

INTERIOR Drywall, Plaster ceiling

OTHER FEATURES ---

AUTOPSY REPORT Y

COHB Y RAD 56 MED 50 ETOH !!

DRUGS N HEART CONDITION N EDEMA Y

SOOT Y EXTENT Branchial passages covered

BURNS Y PERCENT 60 DEGREE 3 OTHER ---

DATE OF DEATH 9-17-73 TIME OF DEATH 12:10 AM

CAUSE OF DEATH CO poisoning

OTHER ---

LAB ANALYSIS ---

GAS OUT Not done

METAL ANAL Cd, Pb, Sb, positive

SOOT HCl, 4% by wt.

APL NO. 121
 RAD NO. 36

RELATED CASES 122

SINGLE MULTIPLE X

SPECIAL ---

SITE INVEST Y

DATE 9-17-73

TIME 12:10 AM

LOCATION P.G. County

PERTINENT CASE ---

BERL AND HALPIN, 1976

BESS KAISER HOSPITAL, Portland, Oregon

TODAY'S DATE _____

PLEASE DO NOT MARK IN THE SHADED AREAS

DISREGARD ALL NUMBERS IN PARENTHESES

01								
(1-2)	(3-8)	(9)	(10-13)	(14-21)	(22-23)	(24)	(25-30)	(31)

Your cooperation in answering the following questions will aid your physician and will provide information to help the Health Plan improve service. Please read the questions carefully and fill in the blanks or check the appropriate boxes. Your answers will be strictly confidential. Thank you

ADDRESS _____

1. DATE OF BIRTH: (Month, Day & Year) _____ (32-35) _____ mo/yr
2. WHAT IS YOUR PRESENT MARITAL STATUS: (Please check appropriate box)

<input type="checkbox"/> Never Married (0)	<input type="checkbox"/> Remarried (2)	<input type="checkbox"/> Widowed (4)
<input type="checkbox"/> Married (1)	<input type="checkbox"/> Divorced (3)	<input type="checkbox"/> Separated (5)

 (36) _____
3. WHAT SERIOUS ILLNESSES HAVE YOU HAD? (Like Pneumonia, Typhoid, etc.)

Disease	Year	Disease	Year

 (37) _____
4. HOW MANY CHILDREN DO YOU HAVE? _____ (38) _____
5. HOW MANY PEOPLE LIVE IN YOUR RESIDENCE? (Include yourself) _____ (39) _____
6. HOW MANY ROOMS ARE IN YOUR RESIDENCE? (Exclude bathrooms) _____ (40) _____ (41) _____
7. DO YOU PRESENTLY SMOKE CIGARETTES? No (0) Yes (1) (42) _____
8. IF YOU DON'T SMOKE CIGARETTES NOW, DID YOU EVER REGULARLY SMOKE CIGARETTES?

<input type="checkbox"/> No (0)	<input type="checkbox"/> Yes (1)
---------------------------------	----------------------------------

 (43) _____

..... IF YES, WHEN DID YOU QUIT SMOKING? _____ (44) _____
9. IF YOU SMOKE CIGARETTES NOW, OR IF YOU EVER REGULARLY SMOKED CIGARETTES:

HOW MANY YEARS HAVE YOU SMOKED (OR DID YOU SMOKE)? _____ (45) _____
APPROXIMATELY HOW MANY CIGARETTES PER DAY DO (DID) YOU SMOKE? _____ (46) _____
10. DO YOU REGULARLY SMOKE CIGARS OR A PIPE? No (0) Yes (1) (47) _____
11. DO YOU DRINK ALCOHOLIC BEVERAGES:

<input type="checkbox"/> Never (0)	<input type="checkbox"/> Occasionally (2)
<input type="checkbox"/> Seldom (1)	<input type="checkbox"/> Frequently (3)
	<input type="checkbox"/> Daily (4)

 (48) _____
12. WHEN YOU DRINK, HOW MANY OF THE FOLLOWING DO YOU USUALLY DRINK DURING A DAY?

_____ Glasses of wine, and/or _____ Bottles (glasses) of beer, and/or _____ Drinks of liquor
--

 (49) _____
13. COMPARED TO LAST YEAR ARE YOU NOW DRINKING:

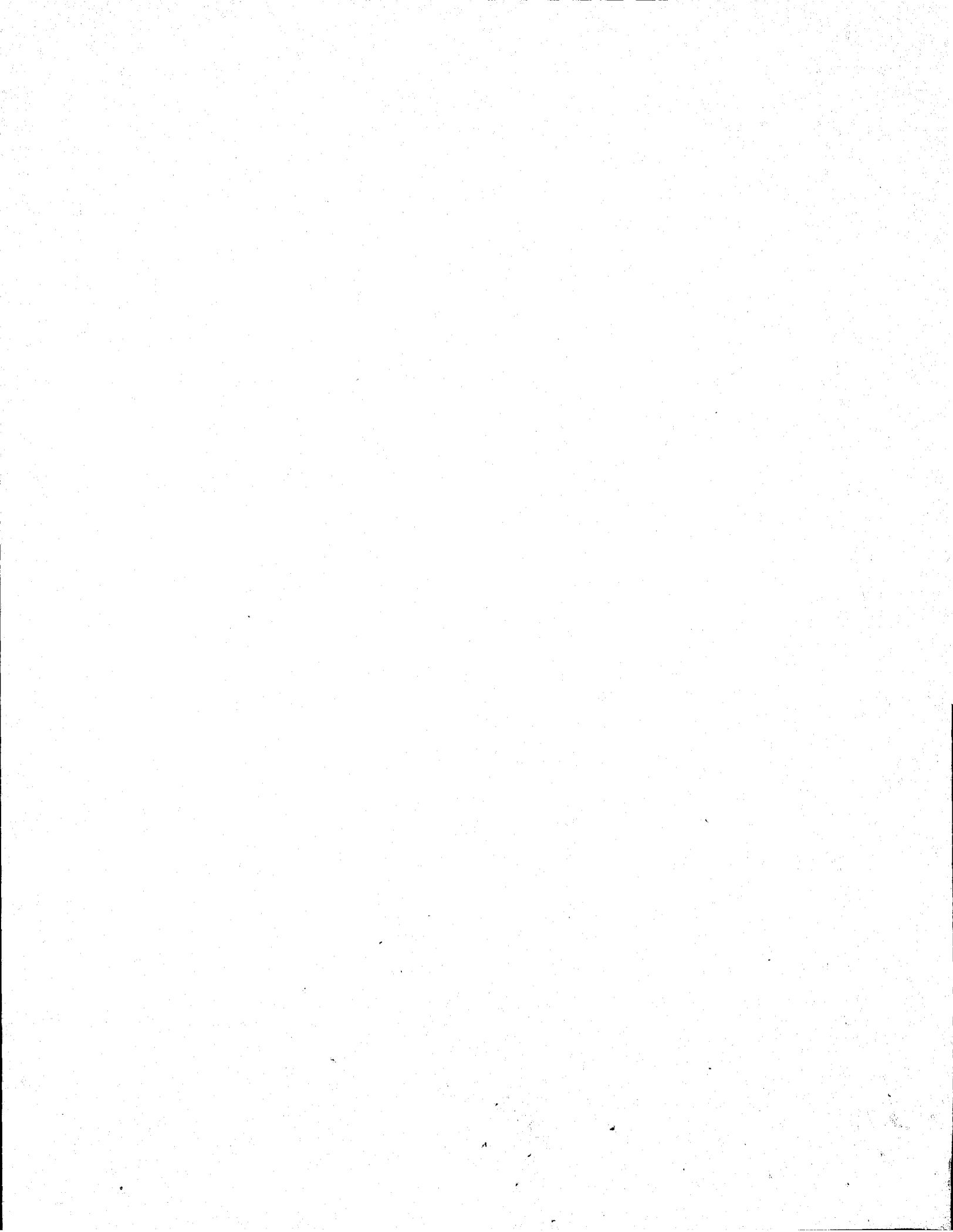
<input type="checkbox"/> More (1)	<input type="checkbox"/> Less (2)
<input type="checkbox"/> About the same amount (3)	

 (50) _____
14. DURING THE LAST YEAR HAVE YOU EVER BEEN WORRIED OR CONCERNED ABOUT YOUR DRINKING?

<input type="checkbox"/> No (0)	<input type="checkbox"/> Yes (1)
---------------------------------	----------------------------------

 (51) _____

PLEASE COMPLETE THE QUESTIONS ON THE OTHER SIDE OF THIS FORM



Sample Fire Fatality Case

VICTIM, PERSONAL DATA

NAME Doe, Jane AGE 46 SEX F RACE W
 MARITAL STATUS M EDUCATION College INCOME Middle
 MEDICAL HISTORY N.A. OCCUPATION School teacher

SCENE REPORT

CASUALTIES 9 FATAL 2 SMOKE/GAS BURN OTHER
 CIVILIANS 2 FIREMAN 1

ESCAPES 2 AGES 14, 48

PATIENT DISPOSITION Dead at scene

RESUSCITATION ATTEMPT 10 MINUTES ESCAPE ATTEMPT Y

VICTIM LOCATION Bedroom, rear, near window

CONTRIBUTING FACTORS

HANDICAPPED <u>--</u>	BLOCKED EXITS <u>--</u>
MEDICATED <u>--</u>	TRAPPED <u>X</u>
INTOXICATED <u>X</u>	PANIC <u>--</u>
ASLEEP <u>--</u>	REENTERING <u>--</u>
OTHER <u>--</u>	OTHER <u>--</u>

FIRE DATA

CAUSE Smoking in bed

INITIAL MATERIAL IGNITED Mattress and bedding

MATERIAL BURNED AND ORDER Mattress and bedding, bed
bedroom furnishings

SAMPLES Y WHAT Soot, mattress, rug

LOCATION Bedroom, rear

EXTENT Bedroom, bathroom

SPREAD FACTOR Bedroom furnishings

OCCUPANCY

RESIDENCE -- APARTMENT X OTHER --

TYPE Garden

NUMBER OF FLOORS 2 TYPE OF HEATING Gas

TYPE OF CONSTRUCTION Brick and frame

NUMBER APTS/FLOOR 2 NUMBER OF EXIT DOORS 1

FIRE FLOOR 1 VICTIM FLOOR 1

BUILDING MATERIALS

EXTERIOR Brick veneer

INTERIOR Drywall, Plaster ceiling

OTHER FEATURES --

AUTOPSY REPORT Y

COHB Y RAD 56 MED 50 ETOH !!

DRUGS N HEART CONDITION N EDEMA Y

SOOT Y EXTENT Branchial passages covered

BURNS Y PERCENT 60 DEGREE 9 OTHER --

DATE OF DEATH 9-17-73 TIME OF DEATH 12:10 AM

CAUSE OF DEATH CO poisoning

OTHER --

LAB ANALYSIS --

GAS OUT Not done

METAL ANAL Cd, Pb, Sb, positive

SOOT HCl, 4% by wt.

APL NO. 121
RAD NO. 96

RELATED 122
CASES --

SINGLE --
MULTIPLE X

SPECIAL --

SITE --
INVEST Y

DATE 9-17-73

TIME 12:10 AM

LOCATION P.G. County

PERTINENT --
CASE --

BESS KAISER HOSPITAL, Portland, Oregon

TODAY'S DATE _____

PLEASE DO NOT MARK IN THE SHADED AREAS

DISREGARD ALL NUMBERS IN PARENTHESES

01								
(1-2)	(3-8)	(9)	(10-13)	(14-21)	(22-23)	(24)	(25-30)	(31)

Your cooperation in answering the following questions will aid your physician and will provide information to help the Health Plan improve service. Please read the questions carefully and fill in the blanks or check the appropriate boxes. Your answers will be strictly confidential. Thank you

ADDRESS _____

1. DATE OF BIRTH: (Month, Day & Year) _____

(32-35) _____
mo/yr

2. WHAT IS YOUR PRESENT MARITAL STATUS: (Please check appropriate box)

- Never Married (0) Remarried (2) Widowed (4)
- Married (1) Divorced (3) Separated (5)

(36) _____

3. WHAT SERIOUS ILLNESSES HAVE YOU HAD? (Like Pneumonia, Typhoid, etc.)

Disease	Year	Disease	Year

(37) _____

4. HOW MANY CHILDREN DO YOU HAVE? _____

(38) _____

5. HOW MANY PEOPLE LIVE IN YOUR RESIDENCE? (Include yourself) _____

(39) _____

6. HOW MANY ROOMS ARE IN YOUR RESIDENCE? (Exclude bathrooms) _____

(40) (41) _____

7. DO YOU PRESENTLY SMOKE CIGARETTES? No (0) Yes (1)

(42) _____

8. IF YOU DON'T SMOKE CIGARETTES NOW, DID YOU EVER REGULARLY SMOKE CIGARETTES?

- No (0) Yes (1)

(43) _____

..... IF YES, WHEN DID YOU QUIT SMOKING? _____

(44) _____

9. IF YOU SMOKE CIGARETTES NOW, OR IF YOU EVER REGULARLY SMOKED CIGARETTES:

HOW MANY YEARS HAVE YOU SMOKED (OR DID YOU SMOKE)? _____

(45) _____

APPROXIMATELY HOW MANY CIGARETTES PER DAY DO (DID) YOU SMOKE? _____

(46) _____

10. DO YOU REGULARLY SMOKE CIGARS OR A PIPE? No (0) Yes (1)

(47) _____

11. DO YOU DRINK ALCOHOLIC BEVERAGES: Never (0) Occasionally (2)

Seldom (1) Frequently (3)

Daily (4)

(48) _____

12. WHEN YOU DRINK, HOW MANY OF THE FOLLOWING DO YOU USUALLY DRINK DURING A DAY?

_____ Glasses of wine, and/or _____ Bottles (glasses) of beer, and/or _____ Drinks of liquor

(49) _____

13. COMPARED TO LAST YEAR ARE YOU NOW DRINKING: More (1) Less (2)

About the same amount (3)

(50) _____

14. DURING THE LAST YEAR HAVE YOU EVER BEEN WORRIED OR CONCERNED ABOUT YOUR DRINKING? No (0) Yes (1)

(51) _____

PLEASE COMPLETE THE QUESTIONS ON THE OTHER SIDE OF THIS FORM

15. HOW MANY TIMES IN THE PAST THREE YEARS HAVE YOU BEEN HOSPITALIZED?
(Exclude this time) _____

(52) _____

16. BEFORE THIS ILLNESS WERE YOU: (Check one)

- Employed or self employed (1) Student (4)
- Retired (2) Housewife (6)
- Unemployed (3) Other (specify) _____ (5)

(MALE)

(53) _____

IF EMPLOYED, WHAT COMPANY DO YOU WORK FOR? _____

WHAT IS THE SPECIFIC JOB? _____

(If retired, please state former occupation) _____

(54-56) _____

17. IS YOUR SPOUSE: (Check one)

- Employed or self-employed (1) Student (4)
- Retired (2) Housewife (6)
- Unemployed (3) Other (specify) _____ (5)

(FEMALE)

(57) _____

IF EMPLOYED, WHAT COMPANY? _____

WHAT IS THE SPECIFIC JOB? _____

(If retired, please state former occupation) _____

(58-60) _____

18. GENERALLY, HOW WOULD YOU COMPARE YOUR HEALTH WITH THAT OF OTHER PEOPLE YOUR AGE BEFORE BEING HOSPITALIZED:

- Excellent (1) Fair (3)
- Good (2) Poor (4)

(61) _____

19. GENERALLY, HOW DO YOU THINK YOUR HEALTH WILL BE WHEN YOU ARE RELEASED FROM THE HOSPITAL:

- Excellent (1) Fair (3)
- Good (2) Poor (4)

(62) _____

20. WHEN YOU LEAVE THE HOSPITAL, WILL YOU HAVE SOMEONE TO HELP YOU:

- Day and Night (1) Only for meals and/or occasional chores (4)
- Night only (2) Part of the day and a night (5)
- Day only (3) NO HELP WILL BE ABAILABLE (0)

(63) _____

21. WHEN YOU LEAVE THE HOSPITAL, DO YOU PLAN TO GO TO:

- A convalescent or nursing home (1) Your own residence (3)
- A home of a friend or relative (2) Other (specify) _____ (4)

(64) _____

22. WHAT IS YOUR RELIGIOUS PREFERENCE: Protestant (1) Jewish (3)
 Catholic (2) None (0)
OTHER (specify) _____

(65) _____

23. HAVE YOU GRADUATED FROM HIGH SCHOOL? Yes No
HAVE YOU GRADUATED FROM COLLEGE?..... Yes No

(MALE)

HOW MANY TOTAL YEARS OF SCHOOL HAVE YOU COMPLETED? (Count grade school, high school and college) _____

(66-67) _____

24. HAS YOUR SPOUSE GRADUATED FROM HIGH SCHOOL? Yes No
HAS YOUR SPOUSE GRADUATED FROM COLLEGE?..... Yes No

(FEMALE)

HOW MANY TOTAL YEARS OF SCHOOL HAS YOUR SPOUSE COMPLETED? (Count grade school, high school and college) _____

(68-69) _____

25. WHAT IS YOUR TOTAL FAMILY INCOME: (Family income is the income of the head of the family plus the income of all relatives in the household.)

- Under \$2,500 (01) \$10,000-12,499 (05) \$25,000-29,999 (11)
- \$2,500-4,999 (02) \$12,500-14,999 (06) \$30,000-34,999 (12)
- \$5,000-7,499 (03) \$15,000-19,999 (09) \$35,000-39,999 (13)
- \$7,500-9,999 (04) \$20,000-24,999 (10) \$40,000 & over (14)

(70) 0

This income information is used for statistical purposes only.

(71-72) _____

26. WHO COMPLETED THIS QUESTIONNAIRE:

- Patient (1) Relative (specify) _____ (2)
- Non-relative (specify) _____ (3)

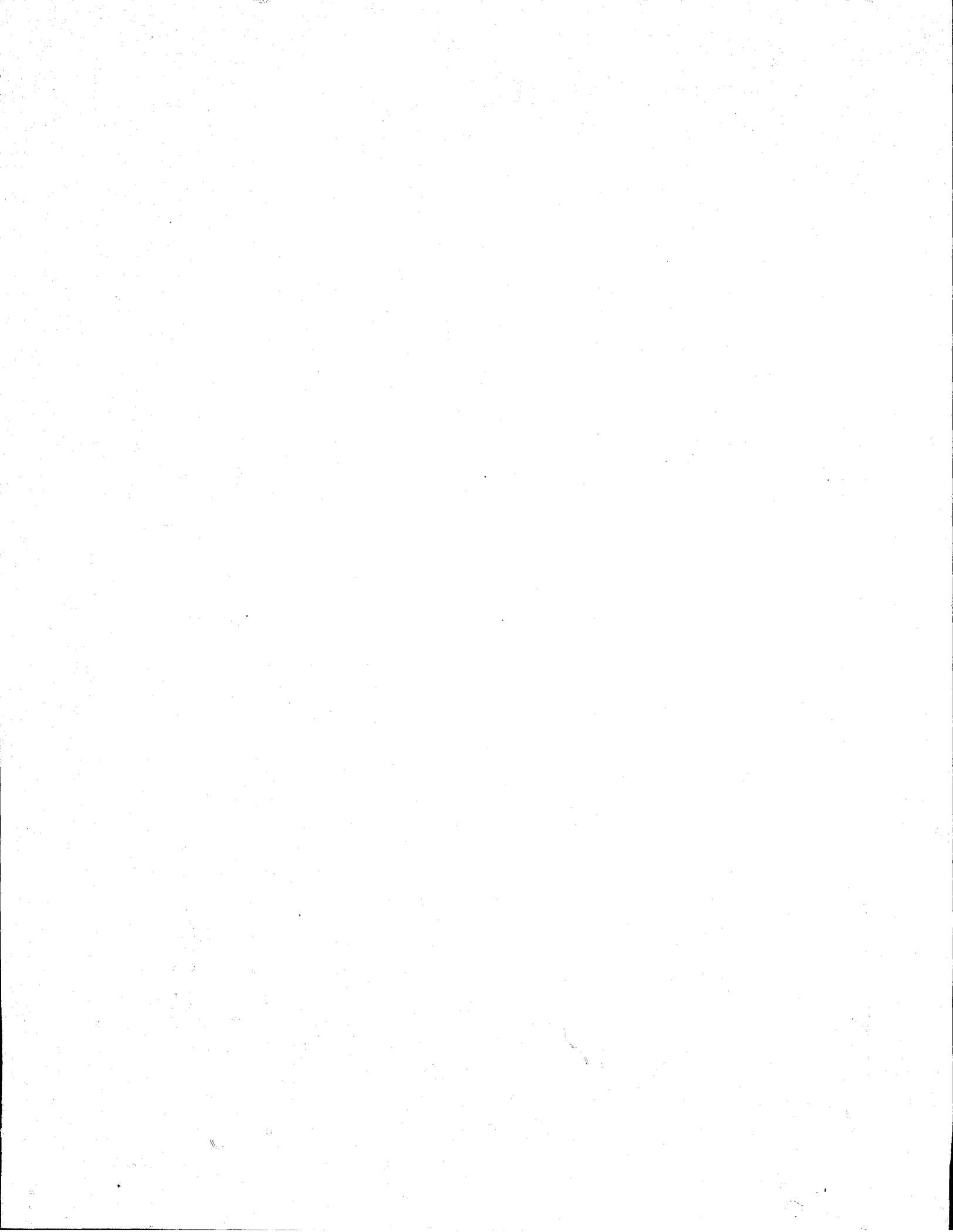
(73) _____

THANK YOU FOR ANSWERING THESE QUESTIONS. YOUR ANSWERS WILL BE VERY USEFUL TO YOUR PHYSICIAN, THE HOSPITAL AND TO THE HEALTH PLAN.

Figure 1

DROWNING STUDY										NAME OF STATE																													
1. NAME OF DECEASED										3. SEX M F																													
2. AGE OF DECEASED										4. DATE OF DEATH																													
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	M	C																		
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	D	A	Y							
5. DEATH CERTIFICATE NUMBER										6. PLACE OF OCCURRENCE																													
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
7. STATE CODE (01-50)										8. DROWNING SITE																													
0	1	2	3	4	5	6	7	8	9	River	Quarry	Lake	Pond	Public swim. pool	Private swim. pool	Swimming pool	Beach	Bay	Other																				
0	1	2	3	4	5	6	7	8	9	Y	N	Unk.	(alcohol mentioned in accompanying narrative)																										
0	1	2	3	4	5	6	7	8	9	Y	N	Unk.																											
0	1	2	3	4	5	6	7	8	9	Y	N	Unk.																											
0	1	2	3	4	5	6	7	8	9	Y	N	Unk.																											

INTERSTATE DROWNING STUDY
PRESS, et al., 1968



APPENDIX G
LIST OF DATA FILES ACTIVELY SOUGHT

Researcher, Data Information	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
<u>ACCIDENTS</u>						
1966 Berthold Brenner, Center for Epidemiological Studies, Rockville, Md. Sample N = approx. 5,000 man-years experience of 2700 interviewed adults Listed as National I & II resides at SRG	X					X
1954-1957 Berthold Brenner (as above) N = 1343 persons admitted to California alcohol treatment centers followed over time to measure mortality			3			X
1972 - ongoing Emmett Condon, Deputy Chief, San Francisco Fire Department, 260 Golden Gate Ave., S.F. 94102 N = 100 fire fatalities	X					
1948 - ongoing The Framingham Study, Framingham, Mass., by the U.S. Department of H.E.W. and the National Health Institute N = 6600 randomly selected adults followed over time			2			X
1974-1976 and ongoing Lowell Gerson, Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, Canada N = 600 fire deaths	X					

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

	Have on Hand	Study in Progress	Researcher Refused*	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
ACCIDENTS (Continued) 1967 - 1973 and ongoing Merwyn R. Greenlick, Kaiser Hospital, Portland, Oregon N = 2500 adults	X					X
1972 - 1976 Paul Haberman, Columbia University, N.Y. and Michael Baden, Chief Medical Examiner, N.Y. N = 2000 (400 homicides, 400 accidents, 300 suicides)		X				X
1971 - 1974 and ongoing Byron M. Halpin, Johns Hopkins University, Applied Physics Lab 8621 Georgia Ave., Silver Spring, Md. 20910 N = 400 at present, ongoing rate of about 100 per year autopsied victims of fires who survive less than 6 hours.		X	X			X
1972 - 1973 and ongoing Dr. Gordon Lange and Randolph Mueller St. Mary's Hospital, Milwaukee, Wisconsin N = 83 burn patients				3		X
1973 - ongoing Andrew McGuire, San Francisco General Hospital Burn Center, San Francisco, CA N = 258 burn patients (we have 60 data sheets on burn patients with alcohol reported)	X					
1974 - ongoing National Household Fire Survey, U.S. Census Bureau for the Consumer Product Safety Commission, Washington, D.C. N unspecified				2		

* Promised but never received

1 = methodological never received

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
<u>ACCIDENTS (Continued)</u>						
Ongoing Consumer Safety Commission, Washington, D.C. National Electronic Injury Surveillance System Data N = approx. 1,000 per year				2		
1965 (National I) Social Research Group, 1912 Bonita Ave., Berkeley, CA 94704 N = 2746 interviews with probability samples of adult household population of the U.S. exclusive of Hawaii and Alaska	X					X
1967 (National II) Social Research Group, 1912 Bonita Ave., Berkeley, CA 94704 N = 1359 interviews with subsample of respondents initially interviewed in 1964-65 National Survey (I)	X					X
1974 - 1975 (National Youthful Drug Study) Social Research Group, 1912 Bonita Ave., Berkeley, CA 94704. N = 2510 interviews with a National sample of males aged 20-30.	X					X
1966 - 1967 Henry Wechsler, The Medical Foundation, 29 Commonwealth Ave., Boston, Mass. 02116 N = 11,644 persons admitted to Boston General Hospital Emergency Service					X	X
1956 - 1975 Karen Wells, Director National Center for the Study of Acute Drug Reactions, University of Miami, Miami, Fla. 33512 N = 13,000 emergency room patients N = 1526 emergency patient in-depth interviews		X				

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
TRAFFIC						
Milton Argeriou Household Survey to the Boston Alcohol Safety Action Program (ASAP)					X	X
1962 - 1963 Robert F. Borckenstein, Indiana University, Department of Police Administration, Bloomington, Indiana N = 9,353 persons in accidents N = 7,590 control cases (random roadside survey)					X	X
1974 - 1975 Jim Fell, MDAIS (Multi-Disciplinary Accident Investigation Study) National Highway Traffic Safety Administration, Washington, D.C. N = unspecified fatalities in Baltimore, N = 300 fatalities in Boston N = 220 fatalities in Albuquerque and N = 50 fatalities in Oklahoma City				1		X
1974 Lyle D. Filkins, Highway Safety Research Institute, University of Michigan, Ann Arbor, Mich. N = 616 Michigan fatalities, N = 2400 Hurley Hospital alcoholics, N = 169 DUIL/DWI Detroit Court Records, N = 1071 Michigan drivers' profiles					X	X
1971 - ongoing Highway Safety Research Institute, University of Michigan, Ann Arbor, Michigan N > 200,000 samples from Colo., Wash., Texas, Fla., Michigan Fatalities File 64-70, 2% State Sample				3		X

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

	Have on Hand	Study in Progress	Researcher Refused*	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
<u>TRAFFIC (Continued)</u>						
1968 - 1972 Fred McGuire, Department of Psychiatry and Human Behavior, University of California, at Irvine N = 1115 drivers (roadside survey), N = 1661 fatalities (drivers and pedestrians)				3		X
1968 - 1971 Donald C. Pelz, Institute for Social Research, University of Michigan, Ann Arbor, Mich. N = probability sample of 3000 interviews and N = 2774 drivers (1673 young men) and 230 unlicensed men and women	X					X
1974 David K. Damkot (formerly headed by H.W. Perrine) Project ABETS, University of Vermont, Burlington, VT 05401 N = 1700 roadside instrument (cameras, etc.) survey				1,3		X
1945 - 1972 Lloyd Shupe (retired) by Richard Pfau, Police Chemist, Scientific Crime Laboratory, Police Department, Columbus, Ohio Data includes all DWI's since 1945, records for these years of accident and fatalities, many alcohol variables. N is undetermined.			X*		X	X
1974 Grant Smith, Ministry of Transportation, Canada N = 9744 Canadian nighttime drivers				3		X

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

TRAFFIC (Continued)

1970 - 1974
 Art Wolfe, Highway Safety Research Institute
 University of Michigan, Ann Arbor, Michigan
 48105
 N = 75,183 nighttime drivers and 2,701
 passengers (this comprises all 77 files for
 the Alcohol Safety Action Project)

X

X

- * Promised but never received
 1 = methodological problems.
 2 = not enough alcohol data, or inadequate measures
 3 = similar data available elsewhere
 4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
<u>CRIME:</u> 1971-1975 (continuing data collection) County-wide C.A.P.E.R. (Crime Analysis Project Evaluation Research), Marilyn Johnson, Director 447 N. 1st St., San Jose, CA 95112 N=125,000 crimes committed in Santa Clara Co.	X					
1960-1964 Criminal Justice Commission, Inc. (private, closed), Dr. William Durr, Sociology Dept., University of Maryland, College Park, Md. 20742 N=578 Homicide cases, 628 offenders, 578 victims					X	X
1974 Lynn Curtis, Bureau of Social Science Research, Washington, D.C. N=10% sample of police reports in 17 cities 4 crimes = homicide, assault, rape, robbery N=172 criminal homicides in Washington D.C., 201 offenders and 172 victims			X*			X
1974 Gerald Globetti, Walter Bennett University of Alabama, Tuscaloosa, Ala. N=242 inmates of Mississippi State Penitentiary			X*			X
1963 Shaw Earl Grigsby, "The Raiford Study" University of Florida, Gainesville (retired) N=351 male prisoners at Raiford Prison, Fla.					X	X

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information
 CRIME (continued)

	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
1962 Samuel B. Guze, Washington University School of Medicine, St. Louis, Mo. N=233 prisoners or former prisoners			X			X
1972-1975 Frank Hartleroad, Villanova University Sociology Department, Villanova, PA 19380 Sample = replication of Wolfgang study using 50% of all homicides in Philadelphia for three years		X				
1975-1976 Law Enforcement Assistance Administration Bureau of the Census, Washington, D.C. 20233 Survey of Inmates of State Correctional Facilities, N = 9040 Survey of Inmates of Local Jails, N=4238 Survey of Local Jails, Institutions, N=3580	X X X					X X X
1972 Demmie Mayfield, M.D., Chief, Psychiatry Service, Veterans Administration Hospital, Davis Park, Providence, R.I., 02908 N=282 prison inmates (we have data on 282)	X					X
current Donald Miller, Scientific Analysis Corporation 2410 Lombard St., San Francisco, CA N=300 randomly selected male offenders		X				

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

CRIME (continued)

	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
1960-1966 Andre Normandeau, Department of Sociology, University of Pennsylvania, Philadelphia, PA 19174 1% random sample 1960-1966 of robberies listed N=1722 robbery incidents				3		X
1976 James Robison, Margo Robison, Criminological Research Associates 1030 Miller Avenue, Berkeley, CA 94708 (large unspecified N) Parolees				2		
current Donna Schramm, Battelle, Human Affairs Research Centers, 4000 N.E. 41st Street, Seattle, Washington 98105 N=50 rapists, N=96 victims		X				
1965 H.L. Voss, University of Kentucky Sociology Department John Hepburn University of Missouri, St. Louis, Mo. Replication of Wolfgang study N=395 cases of criminal homicide in Chicago					X	X
1975 Social Research Group, 1912 Bonita Avenue, Berkeley, CA 94704 N=1513 San Francisco N= 979 Marin Interviews with new probability samples aged 18+	X					

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
CRIME (continued)						
1969 (National III) Social Research Group, 1912 Bonita Avenue, Berkeley, CA 94704 N=978 interviews within a new probability samples of U.S. men aged 21-59	X					X
1973 (National IV) Social Research Group, 1912 Bonita Avenue, Berkeley, CA 94704 N=725 reinterviews with National III respondents (above)	X					X

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
SUICIDE						
1976 - ongoing Dr. Aaron Beck and Dr. Marika Kovacs, Department of Psychiatry, University of Pennsylvania, 429 Stouffer Bldg, Philadelphia General Hospital, 700 Civic Center Blvd., Philadelphia, PA 19104 N=400 attempted suicides	X					X
1957-1958 Dr. Theodore Dorpat, Seattle, Washington N=109 completed suicides, 114 attempted suicides					X	X
1966-1967 Dr. Norman Farberow, Co-Director, Suicide Prevention Center and University of Southern California Medical School, Los Angeles, CA N=50 suicide cases					X	X
1970 Dr. Herbert Ripley, University of Washington Medical School, Seattle, Washington N=104 attempted suicide cases	X					X
1975 Social Research Group, 1912 Bonita Avenue, Berkeley, CA 94704 N=1513 San Francisco N=979 Marin Interviews with new probability samples aged 18+	X					

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
<u>FAMILY ABUSE</u>						
1975 Willem G.A. Bosma, M.D. Director, Alcohol and Drug Abuse Program University of Maryland N = 300, Follow-up = 80, Control = 50 Child Abuse				3		
1975-1977 Dario Chapa San Antonio Child Abuse/Neglect Project 118 Broadway, Suite 327, San Antonio, Tx. 78207 N=200 Child Abuse		X				
1976 Carolyn Eldred, Westat, Inc. 11600 Nebel St., Rockville, Md. 20852 Sample = national Probability sample if feasible Child Abuse		X				
1941-1960 Paul H. Gebhard N = 1356 white male convicted sex offenders				4		X
1977 Richard J. Gelles University of Rhode Island, Kingston, R.I. N = 40 Child Abuse families, Control - 40 families		X	X			X

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
<u>FAMILY ABUSE (continued)</u>						
1966 David G. Gil, Florence Heller Graduate School for Advanced Studies in Social Welfare Brandeis University, Waltham, Mass. N = 1380 cases of reported child abuse.	X					X
1976 - on going Ted Jacob, University of Pittsburgh Department of Psychology, Pittsburg, PA 15213 N = 7-8 families only - child abuse		X				
1976 - present Charles A. Janeway and Eli Newberger Children's Hospital Medical Center 300 Longwood Ave, Boston, Mass. N = 1200 mothers, Follow-up = 400 families - child abuse		X				
1970 - on going James Kent, Ph.D. Los Angeles Children's Hospital Division of Psychiatry 4650 Sunset Blvd., Los Angeles, CA 90027 N = 60, Longitudinal Study - child abuse		X				
1976 - present Joseph Mayer, Rebecca Black Washingtonian Center for Addictions 41 Morton St., Boston, Mass. 02130 N - 200 alcohol and drug abusers, Control unspecified - child abuse		X				

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

	Have on Hand	Study In Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
<u>FAMILY ABUSE (continued)</u>						
1966 Charles McCaghy N = 158 males convicted of child molesting				4		X
1964 Social Research Group, 1912 Bonita, Berkeley, California 94704 N=970 interviews with a selected sample of San Francisco. 1962 respondents and their spouses; marital violence	X					X

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

Researcher, Data Information

	Have on Hand	Study in Progress	Researcher Refused	Not Suitable For Our Use (1, 2, 3, or 4)	Lost or Destroyed	Published Data Available
<u>JUVENILE DELINQUENCY</u>						
1965 Harold Demone, Jr., Division of Alcoholism, Massachusetts Department of Health N = 500 Delinquent Boys. Consecutive admissions at reception center					X	X
1967 Martin Gold, Institute for Social Research University of Michigan N = 829 young people ages 13-16 who resided in previously interviewed national survey households.	X					X
1972 Martin Gold, Institute for Social Research University of Michigan N = 1375 young people ages 11-18 national household survey.	X					X
1960 James McKay, Division of Alcoholism Massachusetts Department of Health N = 122 Boys at reception center ages 8-17					X	X
1971 Jane Widseth, Division of Alcoholism Massachusetts Department of Public Health N = 104 institutionalized girls				3		X

* Promised but never received

1 = methodological problems.

2 = not enough alcohol data, or inadequate measures

3 = similar data available elsewhere

4 = too general for our use (e.g., public opinion on traffic as compared to an accident file.)

ANNEX B

GUIDE TO A REPORT:

"THE EPIDEMIOLOGICAL LITERATURE
ON ALCOHOL, CASUALTIES AND CRIME:
SYSTEMATIC QUANTITATIVE SUMMARIES"

by

Marc Aarens

Anne Blau

Stuart Buckley

Tracy Cameron

Arba Goode

Ellen Lasser

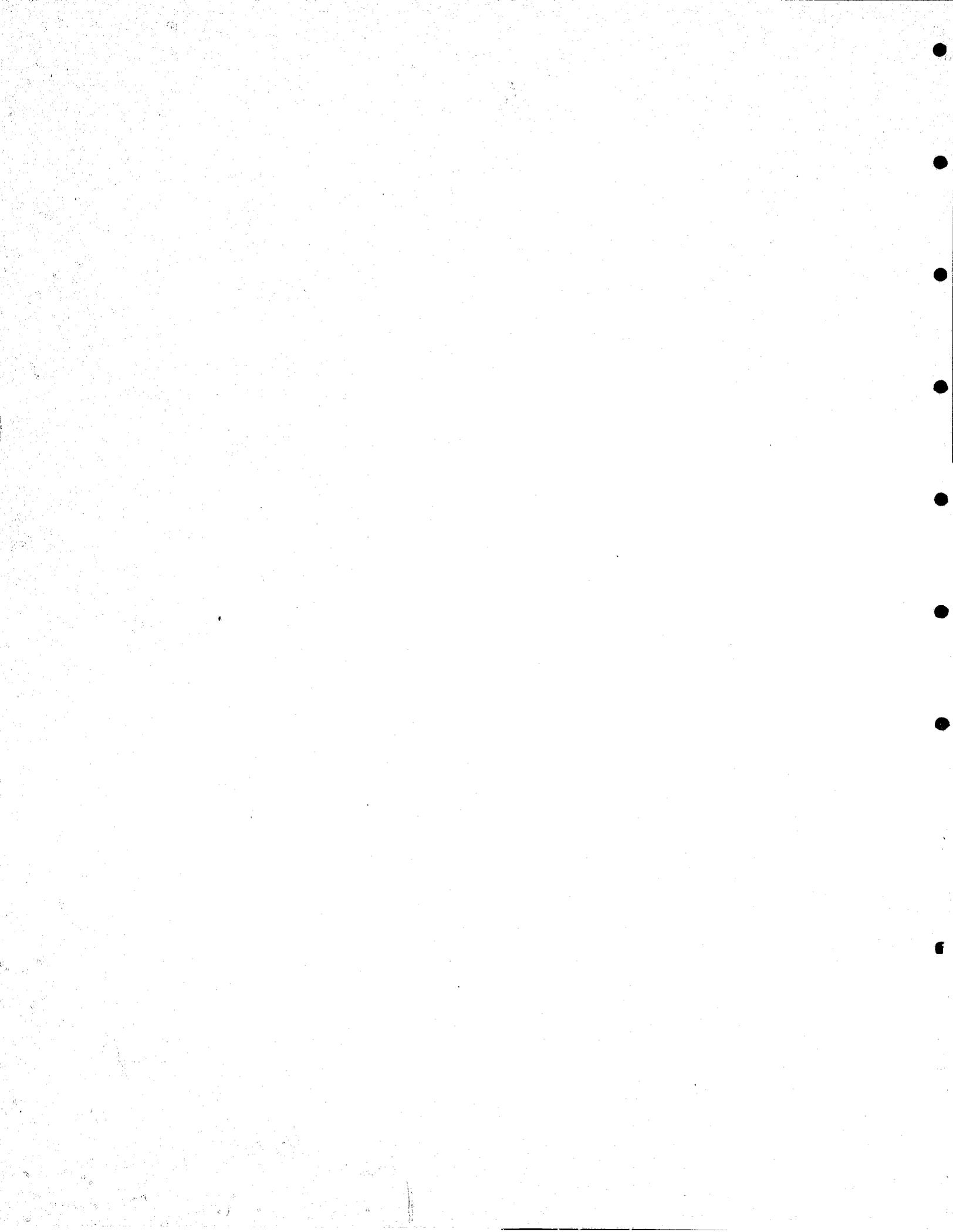
Judy Roizen

Gil Schaeffer

Dan Schneberk

Deborah Wingard

This annex includes the textual guides to and examples of the systematic quantitative summaries of epidemiological studies prepared as a 2000-page report (Report No. C19) to NIAAA.



This annex includes examples of the systematized abstract used in each casualty area -- general accidents, traffic accidents, crime, suicide, and family abuse -- preceded by short introductions in each area explaining the abstracts. Across all the casualty areas, the abstracts are limited to empirical non-experimental research published in English.

A large and diverse literature can be found in each of these areas. In order to compare estimates of alcohol involvement across casualty areas the literatures in each area were reviewed and abstracted in a common frame. The abstracts were intended to categorize in as much detail as possible in a common review the alcohol indicator, the indicator of the serious event, the nature of the sample and the types of analysis used. The purpose was not simply to record the findings of each study but also to provide a method for locating comparable articles.

The common types of studies of alcohol and serious events do not use a general sample of persons or situations, but rather depend on sampling frames which focus on rare situations or cases. Most studies use a sample frame defined either around the occurrence of serious events, or around the presence of an alcohol indicator. There are three major types of such studies, and the reviews are organized around these types.*

I. Studies of alcohol use at the time of the serious event

In studies of this type, the sampling frame is a population of serious events. The sample is collected through one or another institutional "window" on the serious event. Mortality is usually measured using the deaths coming into a particular coroner's office or record-keeping system; injury is usually measured with emergency-room samples; crime is usually measured with a sample of arrests or of those incarcerated for a crime. In principle, the population measured is a

* See Chapter One, Introduction for a more complete description of the three types of studies.

population of events or people-in-events rather than a population of persons, but since the same person cannot enter a mortality sample twice and will usually not enter an injury or arrest sample twice in the period of data collection, such samples are conventionally treated as if they were samples of people. Thus in most studies alcohol is measured in only one person in the event, usually the person defined as the victim or as the person responsible for the event.

Exceptions to this are case-specific crime studies in which alcohol is measured for both the victim and the offender, and some traffic studies in which alcohol is measured for more than one person in the event.

The focus on alcohol in the event is usually directed at one or both of two specific aspects of alcohol: (a) evidence of alcohol influence at the time of the event; (b) evidence of attaining a given level of intoxication at the time of the event. The major means for determining alcohol's presence are self-report by the person in the event; report by another, usually official person, that the person in the event "had been drinking"; and measurement of the alcohol level in the breath, urine, or blood.

II. Studies of drinking history and drinking problems of persons in the serious event

Like the first type of study, this type uses as its sampling frame a population of serious events. The difference from the first type is the explicit emphasis on the person rather than the event or person-event as the unit of analysis. Thus these studies are concerned with drinking measures which are general characterizations of patterns of the person singled out as involved in an event. There are a very wide variety of such measures, so that there is probably less comparability of alcohol measures in this type of study than in either of the other two major types. Measures used have included characterizations of general

current drinking patterns, such as quantity-frequency measures; measures of recent or lifetime drinking problems history, such as overall problems scores or general problem-drinking or alcoholism measures; treatment or other institutional history as a labelled alcoholic; characterization by a knowledgeable -- usually official -- person as a problem drinker or alcoholic; history of specific alcohol problems -- e.g. drunk driving arrests. Sometimes measures of alcohol in the event are treated as characterizing the person's general patterns: e.g. it has been argued in the traffic literature that anyone with a BAC over 0.25 must be viewed as a problem drinker.

Studies of this type are of course focussed on longer rather than shorter term effects of alcohol. In these studies, there is of course no necessary temporal connection between the drinking and the event; they simply study the joint occurrence of the drinking measure and the event in a person over a substantial period of time -- often a lifetime. Sometimes, the focus is in fact on the overlapping of problems in the population -- the existence and size of a multiproblem population.

III. Studies of the involvement in serious events of labelled alcoholics

In studies of this type, the sampling frame is the alcohol dimension rather than the event dimension. Typically, these studies will examine the casualty or crime experience of a sample of clinical or otherwise labelled alcoholics over a considerable period of time -- either prospectively after the labelling has occurred, or retrospectively in the person's life prior to the institutionalization which defined the case into the sample. Since serious events are rare even in high-risk populations, rates of occurrence of events in these samples are uniformly much lower than rates of occurrence of alcohol indicators in event-defined samples. Many studies which report data of this type do not discuss

it, as they regard it as incidental to the main purpose of the study, which is often evaluation of treatment or drinking history. Sometimes, in fact, the relevant data is reported as an element of the sampling procedure in the main study -- e.g., enumerating the deaths at follow-up of a treatment population while discussing sample attrition.

While there is considerable variation in the alcohol-related measure used as the sampling frame in this type of study, the criteria used in the measure are often not spelled out, but rather hidden in an institutional label or category. The measure of serious events is also often not well defined, although of course the fact of death or arrest if not the cause or charge is self-explanatory.

Since clinical populations of alcoholics differ in a number of respects other than their drinking patterns and problems from the general population, a high rate of a serious event in this type of study cannot be ascribed to any particular effect of alcohol, or necessarily to alcohol at all.

Variables Describing the Sample

Most abstracting of research articles is done in essay form. Because of our interest in comparing large numbers of articles across casualty areas we tried to develop a common form across casualties. For describing most studies this system worked well. However, descriptions of some studies proved problematic.

Several pieces of information describing the sample were abstracted from each article: sample population (e.g., prison); the sampling frame (i.e. the base of sample selection); the type of event (e.g., robbery; single vehicle accidents; aviation accidents). The sample parameters should be read together to describe a sample. The forms are not perfectly comparable across casualties, reflecting differences in the casualty literatures.

Many studies present only the vaguest sample description. It is often unclear whether the sample is all events within a specific time period; a sample of events; a sample of those on whom a measure of alcohol involvement was taken. Ambiguities in the abstracts often reflect those found in the articles themselves.

The form retains some ambiguity. For example, a detailed list of events included in each sample is given under "Sample/Event Type". However, in some cases the sample is chosen by the event type (e.g. robbery offenders); in other cases the events are just a chance selection (e.g. any of several casualties that come into an emergency room). Thus, in some cases "Sample/Event Type" denotes a purposive fact of the sample definition, while in other cases the events included in a sample occurred by chance. Another difficulty stems from the description of sample restrictions. Many samples are clearly restricted by age and sex, and cases not falling within the criteria are excluded. Other restrictions are less clear. Two stand out: "death within a certain time period following the event"; "those on whom a BAC was taken." In studies where these function as sample restrictions authors often will not cite them as such; only in the description of the alcohol measure is it clear that the sample is restricted. In some cases restrictions are implied. A study of criminal offenders which includes only offenders on whom a BAC was taken actually has a tacit restriction which includes only those captured within six hours of the crime.

These issues have particular bearing on the estimates of alcohol involvement in these events. It is not always clear from the published reports whether the base N used for the alcohol findings is, for example, all events within a time period, all events in which the victim died within six hours, or all events for which a BAC was taken. The estimates can vary dramatically as a function of the base used. The reviewers have attempted to include all of the information

available in the articles. Often, therefore, there are two or more Sample N's. With reference to the review page on alcohol involvement findings:

--"Total Events" is used to denote all the events in a given period, e.g. "all fatalities in a three month period," "1000 consecutive admissions to an emergency room." Sometimes this is not the stated sample definition of the investigator, although it may be used as the base for some parts of his analysis.

---"Sample N" is the N, that in the best judgment of the reviewer the investigator appears to define as the population sample being investigated.

--"Alcohol Measured N" or "Base of alcohol analysis" is the number of cases on which an alcohol measure is outlined.

All three of these bases are variously used in this literature as the base for measuring alcohol involvement. Usually the presentation of alcohol findings in the reviews follows that in the article.

The alcohol data in these literatures is often a small part of a study and is often treated as a serendipitous finding. This accounts for some of the lack of consistency in reporting.

Alcohol Measures

Alcohol measurement has two foci in these literatures: alcohol use at the time of the event and reports of the drinking histories and drinking problems of persons involved in serious events. The same check list of alcohol measures is used in all reviews. The measure used is noted on the alcohol-involvement-findings page of the review form. The choice of alcohol measure reflects the reviewer's attempt to match the intentions of the investigator. If a study reports drinking histories but uses the term "alcoholism" then it is coded

in the "alcoholic column." The same measure may be a measure of problem drinking to another investigator and is so coded for that study.

Reviews of Type 3 studies -- studies of samples of labelled alcoholics use the same form in all casualty areas except crime. The "Sample Population" column can be used to select out all articles based on samples of alcoholics.

All forms include a column to indicate studies which analyze alcoholics or heavy drinkers as a separate group. This column is checked both when the study in toto is based on a sample of alcoholics as well as when alcoholics or heavy drinkers are treated separately in a casualty sample.

Studies which include two populations (e.g. victims and offenders) and, in some cases, which use two alcohol measures (e.g. an event measure and a drinking history measure) are reviewed on two forms. If a second form is used the primary review has a check in the right hand corner. The second review has the same form number followed by a "B".

Each review form includes a checklist of types of analysis used in each study. It is noted which of the demographic or contextual variables are analyzed by an alcohol measure. In some cases, a variable is both analyzed by an alcohol measure and analyzed in other ways. In a large proportion of the articles the alcohol related analyses are limited to one or two tables only.

Mortality and some accident studies contain data on several casualty areas. Studies of this type are reviewed in each area. These reviews will generally be the last section of reviews for each casualty area.

The comments section on the last page of the review form may have citations to other articles using the same data.

The numbering system for the reviews is as follows:

Accidents	10-N-A or B
Traffic	20-N-A or B
Crime	30-N-A or B and 35-N-A or B
Suicide	40-N-A or B
Family Abuse	50-N-A or B

Cross-casualty studies have as many I.D. numbers as there are relevant casualties. When data are given on more than a single casualty, note is made on the last page of the review form.

Number of studies reviewed:

Accidents	71
Traffic	89
Crime	86
Suicide	83
Family Abuse	23

Some notation and terminology on the review forms requires elaboration. This is covered in the introduction to each area.

Accidents

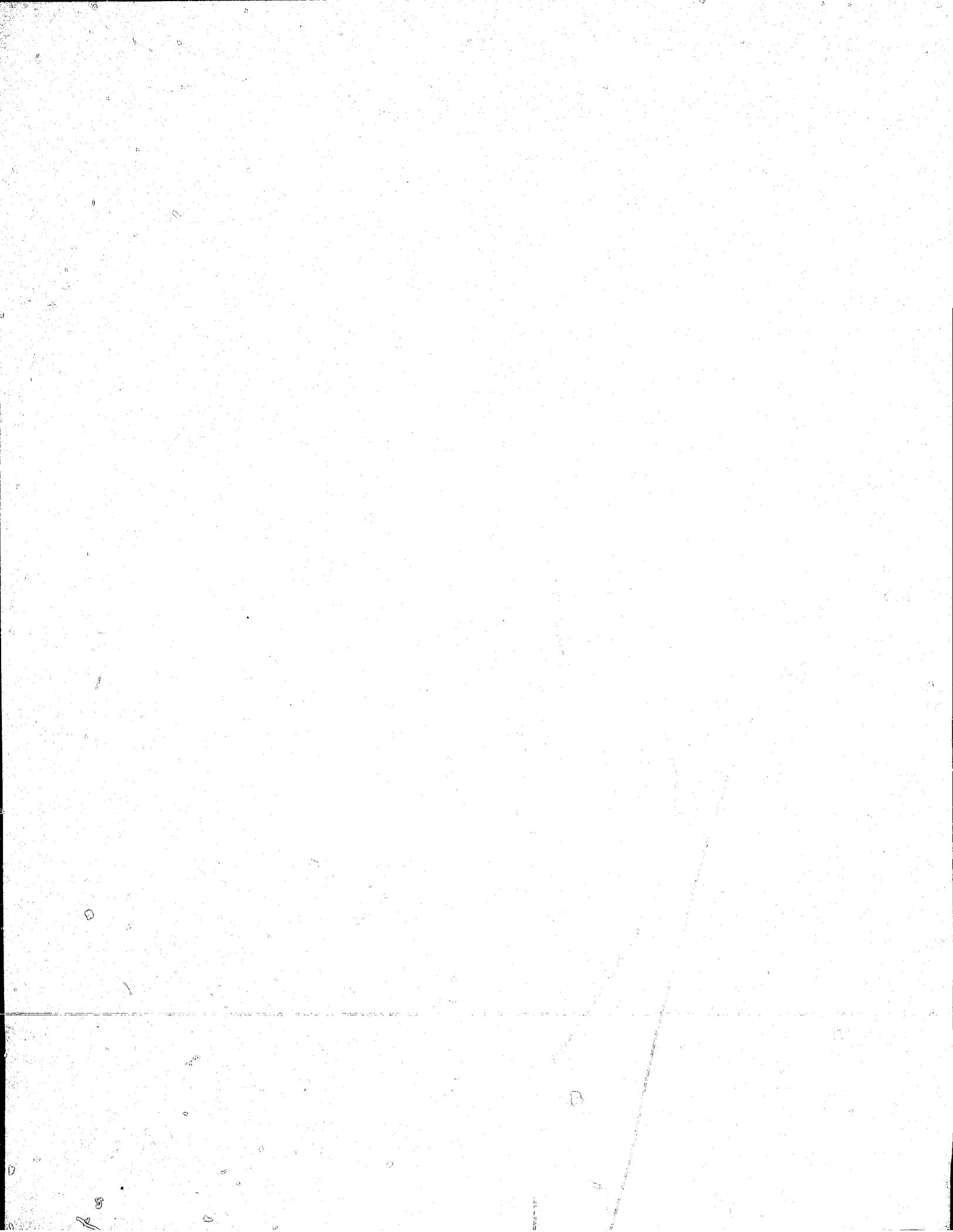
This report has covered the American literature on accidents fairly comprehensively. The foreign literature, though, is limited to those articles within the bibliographies and retrieval systems we used, and by their availability in American libraries and in English. Only articles in English (or completely translated) are reviewed on the Accident Review Forms.

The first page of the Accident Review Form defines the sample. "Sample Population(s)" gives the most general description. Either the sample is defined by an event or by a person. Event studies are generally retrospective, that is the sample is chosen on the basis of some event (i.e. all deaths in New York, all injuries seen in a hospital emergency room or all victims of a fire) and then it is determined if sample members are alcoholics or were drinking prior to the event (Type 1 and Type 2 studies). Alcohol use in these studies is determined after the event. When the sample is defined by persons, the study is generally prospective. For these, a group of persons is defined by drinking status (i.e. alcoholic, heavy, normal drinker or abstainer) and then followed to see if they have elevated rates of accidental death or injury (Type 3 studies). Drinking practices in these studies is determined before the event.

Event studies are further defined by whether they measure mortality or injury. In some cases the sample is a general one, e.g. all "violent"* deaths; in others the sample is "cause specific", e.g. a sample of fire events. See "Sample/Event Type" for a detailed description of events included under each of these terms.

A third sample type defined under "Sample Population(s) By Event" is an "Alcoholic" sample. Studies of this type choose their sample by event (e.g.

* Violent is a term used often in the literature and defined differently for each study. See events included under "Sample/Event Type" or article for specific definition.



CONTINUED

8 OF 9

all deaths in New York) but only consider those cases identified after the event as alcoholics.

"Sample Population(s) by Person" are samples chosen from the "General Population" (e.g. Health Plan members or a Household Survey) or from identified "Alcoholic" populations (e.g. AA members or hospital treatment center patients). All of the above samples are followed for mortality or injury experience.

A few other terms on the first page of the accident review form might need some explanation. Under "Sample/Event Type, Totals": "Unnatural Mortality/Accidents" includes any accidental death or injury; "Natural Mortality/Illnesses" includes any death or illness from a disease process (heart attack, polio, diabetes); "Total Mortality/Accidents" includes both of the above.

On page two of the Accident Review Form under "Sample Parameters": "Date of Collection" refers to the time period within which the data were collected. For prospective studies this is actually the date of sample selection (i.e. the years when general population members of alcoholics were identified for study). Followup years are listed under "Follow-up Period."

"Alcohol Involvement Findings" are reported on pages four and five, for event and person studies respectively. Event studies are identified as Types 1 and 2 by the alcohol measure used: measures 1 to 6 are Type 1 and 7 to 23 are Type 2. Findings for these studies are reported as the proportion of the sample involving alcohol. Person studies, Type 3, generally report findings in a relative risk format; that is, the observed over the expected number (or rate) of accidents. The expected figures are usually based on an age-sex specific control group or some standard population group (such as state or national statistics). To determine which, see "control" column under "Base of Sample Selection" on page one.

* See "Sample Description" on page one and "Alcohol Measure" on page 3 of the form for a more exact definition of the subjects used in a particular study.

ACCIDENT REVIEW FORMS INDEX

Form#/Source/Date

10-01-A, Galbraith et al., 1975	10-28-A, Zeller, 1975
10-02-A, Waller, 1973	10-29-A, Stiehl, 1975
10-03-A, Observer and Maxwell, 1959	10-30-A, Arner, 1973
10-04-A, LeGard and Hudson, 1975	10-31-A, Ryan and Mohler, 1972
10-05-A, Weyman, Greenbaum, Grace, 1974	10-32-A, Mohler et al., 1968
10-06-A, Waller and Lamborn, 1973	10-33-A, Medhus, 1975
10-07-A, Gibbons, Ellis, Plechus, 1967	10-34-A, Lang and Mueller, 1976
10-08-A, Davis, 1968	10-35-A, Crikelair et al., 1968
10-09-A, Gibbons and Plechus, 1965	10-36-A, Halpin et al., 1973
10-10-A, Davis, 1973	10-37-A, Halpin, Fisher, Caplan, 1976
10-11-A, Press, Walker, Crawford, 1968	10-38-A, Berl and Halpin, 1976
10-12-A, Plueckhahn, 1972	10-39-A, Halpin et al., 1975
10-13-A, Adams, 1966	10-40-A, Hollis, 1974
10-14-A, Karaharu and Stjernwall, 1974	10-41-A, Hollis, 1973
10-15-A, Wechsler et al., 1969	10-42-A, Ottoson, 1974
10-15-B, Weschler et al., 1969	10-43-A, MacArthur and Moore, 1975
10-16-A, Brickley, 1915	10-44-A, Phelps, 1911
10-17-A, Honkanen, Visuri, Kilpio, 1975	10-45-A, Trunkey and Lim, 1974
10-18-A, Gay et al., 1970	10-46-A, Fisher, 1952
10-19-A, Suchman, 1970	10-47-A, Wilentz, 1953
10-20-A, Kirkpatrick and Taubenhaus, 1967	10-47-B, Wilentz, 1953
10-21-A, Brenner, Cisin, Newcomb, 1966	10-48-A, Metropolitan Life Ins., 1968
10-22-A, Haberman and Baden, 1974	10-49-A, Brenner, 1967
10-22-B, Haberman and Baden, 1974	10-50-A, Joss, 1947
10-23-A, Dietz and Baker, 1974	10-51-A, Pell and D'Alonzo, 1973
10-24-A, Giertsen, 1970	10-52-A, Nicholls, Edwards, Kyle, 1974
10-25-A, Harper and Albers, 1964	10-53-A, Schuckit and Gunderson, 1974
10-26-A, Smith, Lacefield, Crane, 1970	10-53-B, Schuckit and Gunderson, 1974
10-27-A, Underwood, 1975	10-54-A, Ipsen, Moore, Alexander, 1952

ACCIDENT REVIEW FORMS INDEX (Continued)

Form#/Source/Date

10-55-A, Choi, 1975
10-56-A, De Lint and Levinson, 1975
10-57-A, Dahlgren, 1951
10-58-A, Davies, 1965
10-59-A, Menge, 1950
10-60-A, Schmidt and de Lint, 1969
10-61-A, Schmidt and de Lint, 1972
10-62-A, Waller, 1972
10-63-A, Spain, Bradess, Eggston, 1951
10-64-A, Cutler and Morrison, 1971
10-65-A, Dijk and Dijk-Hoffeman, 1973
10-66-A, Nørvig and Nielsen, 1956
10-67-A, Honkanen and Ottelin, 1976(a)
10-68-A, Honkanen and Visuri, 1976(c)
10-69-A, Honkanen et al., 1976(b)
10-70-A, Deasy, Ruppert, Nordmoe, 1973
10-71-A, Westermeyer and Bratner, 1972

ACCIDENT REVIEW FORM

Article Reviewed On
Additional Form

Citation: Observer and Maxwell, Milson A.

1959 "A study of absenteeism, accidents, and sickness payments in problem drinkers in one industry." QJSA, Vol. 20, pp. 302-312.

Sample Population(s)

By Event (Retrospective):

- Mortality - General
- Violent Only
- Cause Specific
- Alcoholic
- Accidents - General
- Cause Specific
- Alcoholic

By Person (Prospective):

General Population

- Follow-Up Mortality
- Follow-Up Accidents

Alcoholics

- Follow-Up Mortality
- Follow-Up Accidents

Sample/Event Type

- Industry
- Aviation
- Drowning
- "Home"
- Fire/Burns
- Falls
- _____
- _____
- _____
- Traffic
- Assault
- Homicide
- Suicide
- Other Accidents

Base Of Sample Selection

- | Sample | Control |
|-------------------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> Coroner's Report |
| <input type="checkbox"/> | <input type="checkbox"/> Emergency Room Records |
| <input type="checkbox"/> | <input type="checkbox"/> Hospital/Medical Records |
| <input type="checkbox"/> | <input type="checkbox"/> Treatment-Facility
Records _____ |
| <input type="checkbox"/> | <input type="checkbox"/> Health Plan |
| <input type="checkbox"/> | <input type="checkbox"/> Household Survey |
| <input type="checkbox"/> | <input type="checkbox"/> General Population
Statistics _____ |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Other <u>industry medical</u> records, matched on sex, age, length
<u>of service, job type and ethnic background.</u> |
| <input type="checkbox"/> | <input type="checkbox"/> Unspecified |

Totals

- Unnatural Mortality/Accidents
- Natural Mortality/Illnesses
- Total Mortality/Accidents

Sample Description:

48 Employees identified as problem drinkers by supervisors. (32 men and 16 women.)
196 Fellow workers comprised the control group.

Sample ParametersLocation (City/State/Country): One industry in the U.S.A.Date Of Collection (Month/Year): None available

If Prospective

Follow-Up Period (Yr. To Yr.): _____

Years Exposure: _____

Author/Agency Addiction Agencies MD/Coroner Epidemiologist/Public Health Other _____ UnspecifiedData Type Original Data Reanalysis Of Existing Data UnknownSample Restrictions Age Restrictions _____ Race Restrictions _____ Time Restrictions - Event To Death _____ Time Restrictions - Event To Alcohol Measure _____ Men Only Women Only Other _____

ALCOHOL MEASURE

<u>ALCOHOL USE AT TIME OF EVENT</u>	Measured <u>N</u>	<u>DRINKING HISTORY (Con't.)</u>	Measured <u>N</u>
<input type="checkbox"/> BAC/BAL/UAC (1)	_____	<u>Labelled Alcoholic</u>	
<input type="checkbox"/> Police Report (2)	_____	<input checked="" type="checkbox"/> History of Treatment Diagnosis	-
<input type="checkbox"/> Other Official Report (3)	_____	For Alcoholism (16)	
<input type="checkbox"/> Self-Report (4)	_____	<input type="checkbox"/> Post-Event Hospital/Psychiatric	
<input type="checkbox"/> Family/Friend Report (5)	_____	Diagnosis (17)	
<input type="checkbox"/> Unspecified (6)	_____	<input type="checkbox"/> Other Official Report (18)	
		<input type="checkbox"/> Self-Report (19)	
<u>DRINKING HISTORY</u>		<input type="checkbox"/> Family/Friend Report (20)	
<input type="checkbox"/> Autopsies (7)	_____	<input type="checkbox"/> Drinking Practices/Problems (21)	
		<input type="checkbox"/> Autopsy (22)	
<u>Quantity/Frequency</u>		<input type="checkbox"/> Unspecified (23)	
<input type="checkbox"/> Official Report (8)	_____		
<input type="checkbox"/> Self-Report (9)	_____	<u>Other</u>	
<input type="checkbox"/> Family/Friend Report (10)	_____	<input type="checkbox"/> Alcohol Discussed But No Alcohol	
<input type="checkbox"/> Unspecified (11)	_____	Measure Specified	
		<input type="checkbox"/> Alcohol Not Mentioned	
<u>Drinking Problems</u>			
<input checked="" type="checkbox"/> Official Report (12)	-		
<input checked="" type="checkbox"/> Self-Report (13)	-		
<input checked="" type="checkbox"/> Family/Friend Report (14)	-		
<input type="checkbox"/> Unspecified (15)	_____		

Comments:

Each of the measures checked was used by supervisors to identify problem drinkers.
(Drinking problem official report consists of arrests for drunkenness.)

Alcoholics/Problem Drinkers

- Mentioned As Separate Group, But No Empirical Analysis
- Analyzed As Separate Group

ALCOHOL INVOLVEMENT FINDINGS

Event Studies (Retrospective): Percent Alcohol Involved In Accident/Mortality

<u>Total N</u>	<u>Sample N</u>	<u>Event Type</u>	<u>Base N Of Alcohol Analysis</u>	<u>Alcohol Involved N</u>	<u>Event %</u>	<u>Alcohol Measure*</u>
_____	_____	Industry	_____	_____	_____	_____
_____	_____	Aviation	_____	_____	_____	_____
_____	_____	Drowning	_____	_____	_____	_____
_____	_____	"Home"	_____	_____	_____	_____
_____	_____	Fire/Burns	_____	_____	_____	_____
_____	_____	Falls	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	Traffic	_____	_____	_____	_____
_____	_____	Assault	_____	_____	_____	_____
_____	_____	Homicide	_____	_____	_____	_____
_____	_____	Suicide	_____	_____	_____	_____
_____	_____	Other Accidents	_____	_____	_____	_____
_____	_____	<u>Totals</u>	_____	_____	_____	_____
_____	_____	Unnatural Mort- ality/Accidents**	_____	_____	_____	_____
_____	_____	Natural Mortal- ity/Illnesses	_____	_____	_____	_____
_____	_____	Total Mortality/ Accidents**	_____	_____	_____	_____

* Code 1 through 23 from Alcohol Measure List on previous page. If BAC list level used.

** Includes all event types filled-in above, if specified in article.

Comments:

673

Person Studies (Prospective): Relative Risk

Event Type	Sample		Control		Relative Risk (Sample/Control)
	N	Rate	N	Rate	
Industry	55**		27.5***		2
Aviation					
Drowning					
"Home"					
Fire/Burns					
Falls					
Off Job	44		0		
Traffic					
Assault					
Homicide					
Suicide					
Other Accidents					
Totals					
Unnatural Mortality/Accidents*	99		27.5		3.6
Natural Mortality/Illnesses					
Total Mortality/Accidents*					

Sample Base N: 48

Control Base N: 196

Total N From

Which Sample

Taken: 10,000 employees

Rate: -

* Includes all event types filled in above, if specified in article.

Comments: "Accidents for inclusion in this study met the industrial standards for reporting, namely, any traumatic injury suffered by a worker and considered serious enough by its victim to be reported to supervision, or any accident or its results observed and reported by supervision."

** Number of Accidents in the problem drinker group.

*** Comparable rate among controls.

Traffic

The empirical literature on alcohol and highway safety is vast. The majority of these studies exhibit a substantial empirical concern with alcohol as a factor in various types of traffic accidents and violations. However, the number of potential articles and reports available for abstracting was limited by several factors. First, substantial emphasis was placed on obtaining reports based on U.S. data. Only a small number of foreign articles were reviewed and these were limited to articles published in English. Second, we had considerable difficulty in obtaining hundreds of articles and reports listed in computer searches. The articles and reports in question were primarily Department of Transportation (DOT) publications, not available in any of the common journals or other research publications (see Annex A above).

Although the traffic literature has generated considerable research on prevention strategies, countermeasure programs, and the legal problems associated with drunk driving, articles in these areas have not been abstracted. The focus of attention here is empirical research on the statistical association between drinking and traffic accidents and violations. As in other areas included in this report, empirical data on alcohol and traffic crashes and violations has been organized around three common types of empirical research. Research focusing on the proportion of accident-involved persons who were drinking prior to traffic crashes (Type I) is reported on the top of page 3 of the traffic review form. The proportion of accident-involved persons or drivers convicted of DWI (driving while intoxicated) whom researchers deter-

mined were alcoholics or problem drinkers (Type II) is reported on the bottom of page 3 of the review form. The proportion of labelled alcoholics with histories of traffic accidents and violations (Type III) is reported on the bottom of page 2 of the review form.

Information on the size and type of sample is presented on page 1 of the review form. A general description of the sample, as well as the basis for the sample selection are both reported. With the exception of roadside surveys of non-accident-involved persons in the general driving population, the basis of sample selection is recorded in the section on page 1 entitled "Base of Sample Selection." The basis of sample selection for roadside surveys is recorded on page 1 in the section entitled "Base of Roadside Survey."

Further information on the size and type of sample(s) in each article is reported in the three sections which record findings on the statistical association between alcohol and traffic accidents and violations (discussed above). The specific types of samples (i.e., single-vehicle accidents, pedestrian fatalities, etc.) reflect common distinctions used in the literature.

Certain notations and terminology on the review form may require some elaboration. First, on page 1 in the section on "Base of Sample Selection," the category entitled "Researcher Identification of Alcoholics" is checked when the sample of alcoholics analyzed in the article is actually a subsample of a larger group of persons (usually persons involved in accidents), from which the researcher has drawn the sample of alcoholics. As this group of alcoholics was not selected as a sample in its own right on the basis of hospital or alcoholism treatment center records covering a specified period of time, but rather was identified after coming to the researcher's attention for other reasons (usually involvement in a traffic accident), this notation is used.

Second, the term "ASAP" used on page 1 refers to Alcohol Safety Action Projects, a large interrelated network of countermeasure programs concerned with drunk driving.

Third, on page 3 in the section entitled "BAC at the Time of the Event" several sample Ns are recorded. Under "Total" both an "Event N" and a "Person N" are reported. If an article reports that 400 accidents involving 450 persons formed the basis of the sample, both the event N (400 accidents) and the person N (450 persons) are recorded. The distinction between the "Total" Ns and the "Sample" N reflects the inconsistency with which the literature describes samples of accident-involved persons. "Total" N refers to all accidents or persons involved in accidents in a given period of time in a given area (i.e. all fatalities in Baltimore between January, 1969 and March, 1972). "Sample" N refers to some type of restricted sample, rather than to all accidents or all persons in accidents. Common restrictions include, for example, only persons 15 years of age or older or those who survived less than 6 hours after the accident. These restrictions are recorded on the top of page 2.

In addition, the N forming the "Base of Alcohol Analysis" (persons tested for BAC) is also recorded as it is often either the only sample N given or it differs from the sample N reported earlier in the article. All figures reporting the proportion of persons with specific BAC levels are based on this latter sample N.

On page 3 under "Alcoholics/Problem Drinkers" the sample type entitled "Alcohol-Related Crashes" refers to accidents which the researcher determined involved drivers who had been drinking prior to the crash (extent of drinking is often unspecified). "Non-Alcohol-Related Crashes" are, conversely, those

accidents which according to the researcher did not involve drivers who had been drinking prior to the crash.

TRAFFIC REVIEW FORMS INDEX

Form#/Source/Date

20-01-A, Traffic Injury Research Foundation of Canada, 1975	20-27-A, Baker, 1975
20-02-A, Hossack, 1972	20-28-A, Davis, 1974
20-03-A, Gerber, Joliet, Feegel, 1966	20-29-A, Waller, 1970
20-04-A, Baker and Fisher, 1976	20-30-A, Waller, 1968
20-05-A, Neilson, 1963	20-31-A, Schmidt and Smart, 1959
20-06-A, Tonge, 1972	20-32-A, Selzer, 1969
20-07-A, Filkins et al., 1970	20-33-B, Selzer, 1969
20-07-B, Filkins et al., 1970	20-34-A, Boston Univ. School of Law, 1976
20-07-C, Filkins et al., 1970	20-35-A, Selzer, 1969
20-08-A, Haddon and Bradess, 1959	20-30-B, Selzer, 1969
20-09-A, Wilson and Campbell, 1970	20-36-A, Smart and Schmidt, 1967
20-10-A, National Safety Council, 1965	20-37-A, Turk, McBay, Hudson, 1974
20-11-A, Marsden, 1972	20-38-A, Popham, 1956
20-12-A, Solheim, 1964	20-39-A, Yoder and Moore, 1973
20-13-A, Neilson, 1969	20-40-A, Fine, Scoles, Mulligan, 1975
20-14-A, California Highway Patrol, 1967	20-41-A, Baker and Spitz, 1970
20-15-A, Rosenberg, Laessig, Rawlings, 1974	20-42-A, Schmidt, Smart, Popham, 1962
20-16-A, Holcomb, 1938	20-42-B, Schmidt, Smart, Popham, 1962
20-17-A, McGuire, 1975	20-43-A, Selzer et al., 1963
20-17-B, McGuire, 1975	20-44-A, Waller and Turkel, 1966
20-18-A, McCarrol and Haddon, 1962	20-45-A, Selzer and Vinokur, 1975
20-19-A, Haddon et al., 1961	20-45-B, Selzer and Vinokur, 1975
20-20-A, Waller et al., 1969	20-46-A, Freimuth, Watts, Fisher, 1958
20-21-A, Laessig and Waterworth, 1970	20-47-A, Farris, Malone, Lilliefors, 1975
20-22-A, Birrel, 1971	20-47-B, Farris, Malone, Lilliefors, 1975
20-23-A, Kowalski, Rose, Fiorese, 1967	20-48-A, Borkenstein et al., 1964
20-24-A, Baker, Robertson, Spitz, 1971	20-48-B, Borkenstein et al., 1964
20-25-A, McBay et al., 1974	20-50-A, Boston Univ. Law-Medicine Institute, 1969
20-26-A, Schmidt et al., 1970	

680
TRAFFIC REVIEW FORMS INDEX (Continued)

Form#/Source/Date

20-51-A, Hossack and Brown, 1974	20-83-B, Schuckit and Gunderson, 1974
20-52-A, Sevitt, 1973	20-85-A, Davies, 1965
20-53-A, Filkins and Carlson, 1973	20-86-A, Menge, 1950
20-54-A, Waller, 1967	20-87-A, Schmidt and de Lint, 1972
20-54-B, Waller, 1967	20-88-A, Spain, Bradess, Eggston, 1951
20-55-A, Perrine, Waller, Harris, 1971	20-89-A, Cutler and Morrison, 1971
20-55-B, Perrine, Waller, Harris, 1971	20-90-A, Honkanen and Ottelin, 1976(a)
20-55-C, Perrine, Waller, Harris, 1971	20-91-A, Honkanen and Visuri, 1976(c)
20-59-A, Rosenberg et al., 1972	20-92-A, Honkanen et al. 1976(b)
20-59-B, Rosenberg et al., 1972	20-93-A, Deasy and Nordmoe, 1973
20-60-A, Kaestner, Howard, Warmoth, 1969	20-94-A, Westermeyer and Bratner, 1972
20-62-A, Argeriou and Paulino, 1976	
20-62-B, Argeriou and Paulino, 1976	
20-63-A, Kelleher, 1971	
20-64-A, Galbraith, 1975	
20-65-A, Waller and Lamborn, 1973	
20-66-A, Karaharu and Stjernvall, 1974	
20-67-A, Wechsler, 1969	
20-67-B, Wechsler, 1969	
20-69-A, Gay et al., 1970	
20-70-A, Brenner, Cisin, Newcomb, 1966	
20-71-A, Haberman and Baden, 1974	
20-71-B, Haberman and Baden, 1974	
20-73-A, Arner, 1973	
20-74-A, Medhus, 1975	
20-75-A, Phelps, 1911	
20-76-A, Trunkey and Lim	
20-77-A, Fisher, 1952	
20-78-A, Wilentz, 1953	
20-78-B, Wilentz, 1953	
20-80-A, Brenner, 1967	
20-81-A, Joss, 1947	
20-82-A, Nicholls, Edwards, Kyle, 1974	
20-83-A, Schuckit and Gunderson, 1974	

Article Reviewed on
Additional Form

Citation: McBay, Arthur J.; Hudson, R. Page; Hamrick, Nancy and Beaubier, Jeff
1974 "Alcohol involvement in highway fatalities in North Carolina,
1972." Journal of Safety Research, Vol. 6, No. 4, pp. 177-181.

Sample: All reports of fatal crashes occurring in North Carolina during 1972 were reviewed with particular attention paid to reported blood alcohol levels. 969 operators, 566 passengers and 433 pedestrians died in a total of 1732 fatal crashes.

Base of Sample Selection

- Coroner's Report
- Police Report
- Court Records
- DMV/Dept. of State Driving Records
- Alcoholism Treatment Center
- Hospital Admissions/Records
- Researcher Identification of Alcoholics
- Household Survey
- Other _____
- Unspecified

Data Type

- Original Data
- Re-Analysis of Existing Data
- Unknown

ASAP

- Data From ASAP Study

Comments:

Base of Roadside Survey

- Roadside Control Sites Matched by Place and Time To Accident Sample
- Roadside Sites Selected in High-Accident-Risk Areas
- Roadside Sites Selected As Random Sample
- Other _____
- Unspecified

Author/Agency

- Highway Safety/Government Agencies
- Medical Practitioner/Coroner
- Epidemiologist/Public Health
- Social Scientist/Psychologist
- Alcohol Researcher
- Other _____
- Unspecified

Sample Restrictions

Age
 15 And Older
 Young Drivers _____
 Other 16+ _____
Sex
 Men Only
 Women Only
Race
 Whites Only
 Non-Whites Only
Residence (City/County)
 Residents Only

Time/Sampling Frame I
 Holidays Only
Time/Sampling Frame II
 Nighttime Only
 Weekend Only
 Weekend Nighttime Only
 Other _____
Time/Accident To Death
 Within 1 Hour
 Within 6 Hours
 Other _____

Time/Accident to Alcohol Measure
 Within 6 Hours
 Other _____
Driver Status
 Licensed Only
 Licensed And Unlicensed
 With Driving Conviction/
 Crashes
Other
 Specify _____

ALCOHOL MEASURE

<u>ALCOHOL USE AT TIME OF EVENT</u>	Measured N	<u>Labelled Alcoholic</u>	Measured N
<input checked="" type="checkbox"/> BAC/BAL/UAC	791	<input type="checkbox"/> History Of Treatment/Diagnosis For Alcoholism	_____
<input type="checkbox"/> Police Report	_____	<input type="checkbox"/> Post-Event Hospital/Psychiatric Diagnosis	_____
<input type="checkbox"/> Other Official Report	_____	<input type="checkbox"/> Other Official Report	_____
<input type="checkbox"/> Self-Report	_____	<input type="checkbox"/> Self-Report	_____
<input type="checkbox"/> Family/Friend Report	_____	<input type="checkbox"/> Family/Friend Report	_____
<input type="checkbox"/> Unspecified	_____	<input type="checkbox"/> Drinking Practices/Problems	_____
<u>DRINKING HISTORY</u>		<input type="checkbox"/> Autopsy	_____
<input type="checkbox"/> Autopsies	_____	<input type="checkbox"/> Unspecified	_____
<u>Quantity/Frequency</u>		<u>Other</u>	
<input type="checkbox"/> Official Report	_____	<input type="checkbox"/> Alcohol Discussed But No Alcohol Measure Specified	_____
<input type="checkbox"/> Self-Report	_____	<input type="checkbox"/> Alcohol Not Mentioned	_____
<input type="checkbox"/> Family/Friend Report	_____	<u>Comments:</u>	
<input type="checkbox"/> Unspecified	_____		
<u>Drinking Problems</u>			
<input type="checkbox"/> Official Report	_____		
<input type="checkbox"/> Self-Report	_____		
<input type="checkbox"/> Family/Friend Report	_____		
<input type="checkbox"/> Unspecified	_____		

LABELLED ALCOHOLICS/DRIVING RECORD

Base N	%	
_____	_____	With Records Of Traffic Accidents
_____	_____	With Record Of DWI/DUIL



BAC AT THE TIME OF THE EVENT

Total Event Person N	Sample Person N	Sample Type	Base of Alcohol Analysis		BAC .00-.09		BAC ≥ .10%		BAC ≥ .15%	
			N	%	N	%	N	%	N	%
	969	<u>Drivers</u>								
		All Fatal Crashes	615		348	57	267	43		
		All Non-Fatal Crashes								
		All Accidents								
652	460	Single-Vehicle Fatal Crashes	308		114	37	194	63		
658	509	Multi-Vehicle Fatal Crashes	307		234	76	73	24		
		Responsible for Fatal Crashes								
		Not Responsible for Fatal Crashes								
		Roadside Survey								
	566	<u>Passengers</u>								
		Fatal Crashes								
		Non-Fatal Crashes								
		All Accidents								
		Roadside Survey								
	433	<u>Pedestrian</u>								
	299	Fatal Crashes	176		57	38	109	62		
		<u>Unspecified</u>								
1732		Fatalities								
		Non-Fatalities								
		Roadside Survey								
		Other								

ALCOHOLICS/PROBLEM DRINKERS

— Mentioned, but no empirical analysis

Sample Type	Base of Alcohol Analysis N	% Alcoholics/ Problem Drinkers	Alcohol Measure
<u>Drivers</u>			
Fatal Crashes			
Alcohol-Related Crashes			
Non-Alcohol-Related Crashes			
All Accidents			
<u>DWIs</u>			
Fatalities Unspecified			
Other			

CHECKLIST OF OTHER AVAILABLE EMPIRICAL INFORMATION

<u>Analyzed By</u>	<u>No Alcohol Analysis</u>	<u>Demographic</u>	<u>Driving Record</u>
<input checked="" type="checkbox"/> Alcohol		Age	<input checked="" type="checkbox"/> DWIs/DUIL
<input type="checkbox"/>	<input type="checkbox"/>	Sex	<input checked="" type="checkbox"/> Other Driving Violations
<input type="checkbox"/>	<input type="checkbox"/>	Race And Ethnicity	<input checked="" type="checkbox"/> Accidents
<input type="checkbox"/>	<input type="checkbox"/>	Marital Status	
<input type="checkbox"/>	<input type="checkbox"/>	Education	<u>Other Personal Data</u>
<input type="checkbox"/>	<input type="checkbox"/>	Occupation/SES	<input type="checkbox"/> Medical Record
<input type="checkbox"/>	<input type="checkbox"/>	Religion	<input checked="" type="checkbox"/> Coroner's Report
			<input type="checkbox"/> Personal History
		<u>Temporal Variation</u>	<input type="checkbox"/> Criminal Record
<input type="checkbox"/>	<input type="checkbox"/>	Time Of Day	<input type="checkbox"/> Psychological, Attitudinal
<input type="checkbox"/>	<input type="checkbox"/>	Day Of Week	<input type="checkbox"/> and Opinion Variables
<input type="checkbox"/>	<input type="checkbox"/>	Month	<input type="checkbox"/> Annual Mileage
		<u>Event Information</u>	<u>Additional Alcohol Information</u>
<input type="checkbox"/>	<input type="checkbox"/>	Road Conditions/Type	<input type="checkbox"/> Full Range Of BAC Available
<input type="checkbox"/>	<input type="checkbox"/>	Weather Conditions	<input type="checkbox"/> Drinking Patterns
<input type="checkbox"/>	<input type="checkbox"/>	Origin/Destination	<input type="checkbox"/> Drinking Capacity/Driving
<input type="checkbox"/>	<input type="checkbox"/>	Severity Of Accident	<input type="checkbox"/> Impairment
<input type="checkbox"/>	<input type="checkbox"/>	Detailed Accident Information	<input type="checkbox"/> Drinking/Driving Frequency
<input type="checkbox"/>	<input type="checkbox"/>	Safety Features of Vehicle	<input type="checkbox"/> Alcohol/Accident Time Sequence
<input type="checkbox"/>	<input type="checkbox"/>	Safety Features Of Environment	<input type="checkbox"/> Other Alcohol
<input type="checkbox"/>	<input type="checkbox"/>	Other _____	<input type="checkbox"/> Other Drug

Type Of Analysis

- One Way Tables
 Two Way Tables
 Three Way Tables
 Correlational Analysis
 Over-Time Analysis
 Cross-National Analysis
 Comparison of Means For Subgroups Or Samples
 Comparison To General Population
 Response-Rate Information _____

Information On Other Casualties

- Accidents/Mortality
 Crime
 Suicide
 Child Abuse/Family Violence
 Juvenile Delinquency

Additional Information

- Tables Run By Variables Not Mentioned Here

Comments:

Crime

In abstracting the empirical literature on the relationship between drinking and criminal behavior and careers we have emphasized contemporary English language research. Studies not readily available in English and studies which cited only a single number with no discussion of how the estimate was arrived at (e.g., 60% of homicides in small towns are alcohol involved) were not abstracted. Although there are a number of nineteenth century studies of drinking and crime, they were not covered in the abstracts, though several are cited in the bibliography.

Most of the Type I studies in this literature focus on a single crime and are studies of either victims or offenders. Some research since the fifties (the best of which is research we call "case-specific") offers data on both victims and offenders. Although a large part of the research on drinking and crime is academic or quasi-academic, many studies amount to little more than a count of the presence of alcohol in victims of a crime.

Little research on drinking and crime uses as precise an alcohol measure as a blood alcohol level chemical analysis. Much of the Type I research is witness observation of the presence of alcohol; Type II research often depends primarily on self-reports or witness observations.

Studies of the criminal histories of labelled alcoholics are reviewed on a separate form.

The first page of the crime review form defines various aspects of the sample. Studies in this area are of victims and/or offenders. Occasionally, a study samples "cases" (allowing for single or multiple offenders and victims in a single event). (Alcoholic populations, Type III, are reviewed on the form titled "Criminal Histories of Labelled Alcoholics.") The column labelled

"Sample population" should be read as prison offenders, arrested offenders, victims, paroled offenders, etc. and should not be confused with "sample/location" which is used to describe the location of the data sources. The events included in each sample are listed under "Sample/crime."

CRIME REVIEW FORMS INDEX

Form#/Source/Date

30-01-A, Voss and Hepburn, 1968	30-32-A, U.S. Dept. of Justice, LEAA 1976
30-02-A, Pittman and Handy, 1964	30-33-A, McGeorge, 1963
30-02-B, Pittman and Handy, 1964	30-34-A, Dervillee et al., 1961
30-04-A, Wolfgang and Strohm, 1956	30-35-A, Baker, 1959
30-04-B, Wolfgang and Strohm, 1956	30-36-A, Grigsby, 1963
30-06-A, Hollis, 1974	30-37-A, Ward, Jackson, Ward, 1969
30-06-B, Hollis, 1974	30-37-B, Ward, Jackson, Ward, 1969
30-07-A, Marek, Wikacki, Hanausek, 1974	30-38-A, Calif. Dept. of Public Health, 1959
30-08-A, Gray and Moore, 1941	30-39-A, Washikhongo, 1976
30-08-B, Gray and Moore, 1941	30-40-A, Bartholomew, 1968
30-10-A, Harlan, 1950	30-40-B, Bartholomew, 1968
30-11-A, Winkler et al., 1954	30-41-A, Mayfield, 1972
30-12-A, Shupe, 1954	30-42-A, Bensing and Schroeder, 1960
30-13-A, Virkkunen, 1974	30-43-A, Criminal Justice Commission, 1967
30-14-A, Stearns, 1925	30-43-B, Criminal Justice Commission, 1967
30-15-A, Cassity, 1941	30-44-A, Edwards, Hensman, Peto, 1971
30-16-A, Levy, Kunitz, Everett, 1969	30-45-A, Hensman, 1969
30-17-A, Lanzkron, 1963	30-46-A, Edwards et al., 1976
30-18-A, Nicol, et al., 1973	30-47-A, Edwards et al., 1972
30-19-A, Gibbens and Silberman, 1970	30-48-A, Gilles, 1965
30-20-A, Maule and Cooper, 1966	30-49-A, Thum, Wechsler, Demone,
30-21-A, Banay, 1942	30-50-A, Galbraith et al., 1975
30-21-B, Banay, 1942	30-53-A, Karaharu and Stjernvall, 1974
30-22-A, Scott, 1968	30-54-A, Wechsler et al., 1969
30-23-A, Smith-Moorhouse and Lynn, 1966	30-54-B, Wechsler et al., 1969
30-24-A, Cal. State Dept. of Public Health, 1960	30-56-A, Haberman and Baden, 1974
30-25-A, Wenger, 1944	30-56-B, Haberman and Baden, 1974
30-27-A, Globetti, Bennett, Alsikafi, 1974	30-58-A, Arner, 1973
30-28-A, Cole, Fisher, Cole, 1968	30-59-A, Medhus, 1975
30-29-A, Abrahamsen, 1950	30-62-A, Phelps, 1911
30-30-A, Krauweel, 1955	
30-31-A, Virkkunen, 1974	

CRIME REVIEW FORMS INDEX (Continued)

Form#/Source/Date

30-63-A, Trunkey and Lim, 1974
30-64-A, Fisher, 1952
30-65-A, Wilentz, 1953
30-65-B, Wilentz, 1953
30-67-A, Joss, 1947
30-68-A, Choi, 1975
30-69-A, Davies, 1965
30-70-A, Menge, 1950
30-71-A, Schmidt and de Lint, 1972
30-72-A, Spain, Bradess, Eggston, 1951
30-73-A, Cutler and Morrison, 1971
30-74-A, Nørvig and Nielsen, 1956
30-75-A, Honkanen and Ottelin, 1976(a)
30-76-A, Honkanen and Visuri, 1976(c)
30-77-A, Deasy and Nordmoe, 1973
30-78-A, Westermeyer and Bratner, 1972
30-79-A, Amir, 1971
30-79-B, Amir, 1971
30-80-A, Normandeau, 1968
30-80-B, Normandeau, 1968
30-81-A, Gebhard et al., 1965
30-82-A, Henn et al., 1976
30-83-A, Frisbie, 1969
30-84-A, McCaghy, 1968
30-85-A, Wilschke, 1965
30-86-A, Rada, 1976
30-87-A, Swanson, 1968
30-88-A, Bard and Zacker, 1974
30-89-A, Guze et al., 1962
35-01-A, Hagnell, Nyman, Tunvig, 1973
35-02-A, Bartholomew and Kelley, 1965
35-03-A, Tathod and Thomson, 1971
35-04-A, Hughes, 1945
35-05-A, Ellerman, 1948
35-06-A, Hansen and Teilmann, 1954
35-07-A, Pittman and Gordon
35-08-A, Washbrook, 1976
35-09-A, Lindelius and Salum, 1973
35-10-A, Lindelius and Salum, 1975
35-11-A, Medhus, 1975
35-12-A, Weiner and Weaver, 1974
35-13-A, Tripkovic, 1967

(Article Reviewed on
Additional Form)

CRIME REVIEW

Citation: Voss, Harwin L. and Hepburn, John R.

1968 "Patterns in criminal homicide in Chicago." Journal of Criminal
Law, Criminology and Police Science, Vol. 59, No. 4, pp. 499-508.Sample Population

- Prison
 Arrested
 Victims
 Paroled
 Convicted/Probation
 Mental Hospital
 Alcoholism Treatment Center
 Other _____

 Two or More Populations Analyzed
 Separately

Sample/Crime

- All/Many Differentiated
 Violent Offenders
 Homicide
 Assault
 Rape
 Robbery
 Status Offenses
 Child Molesting
 Other _____

 Crime -- Unspecified/General

Sample Source(s)

- Police Prison Records
 Probation Report
 Interview/Questionnaire
 Coroner's Records
 Court Records
 Other _____

Sample/Location

- City/County
 State
 Jail
 Prison
 Other _____

 Two or More Locations (Cities,
Prisons, etc.)

Sample Description: All 395 cases in which a charge of criminal homicide was filed in the urban area of Chicago during a 1 year period. Of the 429 offenders information was recorded for 415. Of the 395 victims information was available for 394. Information on alcohol involvement is for cases, not for victims or offenders separately.

Sample Restrictions

- Within Short Period After Arrest
- Recent Offenders
- Age Restrictions _____
- Race Restrictions _____
- _____
- Men Only
- Women Only
- Other _____
- _____

Data Type

- Original Data
- Reanalysis of Existing Data
- Unknown

Author/Agency

- M.D./Medical Examiners
- Coroner
- Penologist
- Psychologist/Psychiatrist
- Epidemiologist
- Other Sociologists

Sample Parameters

Date of Data Collection (Mo./Yr.): 1965

Location(s) (City/State/Country): Chicago's urban area, Ill., U.S.A.

ALCOHOL MEASURE

<u>ALCOHOL USE AT TIME OF EVENT</u>	<u>Measured</u> <u>N</u>
<input type="checkbox"/> BAC/BAL/UAC (1)	_____
<input checked="" type="checkbox"/> Police Report Victims (2)	<u>370</u>
<input checked="" type="checkbox"/> Police Report Offenders (3)	<u>370</u>
<input type="checkbox"/> Other Official Report (4)	_____
<input type="checkbox"/> Self-Report (5)	_____
<input type="checkbox"/> Family/Friend Report (6)	_____
<input type="checkbox"/> Unspecified (7)	_____

DRINKING HISTORY

Autopsies (8) _____

Quantity/Frequency

Official Report (9) _____

Self-Report (10) _____

Family/Friend Report (11) _____

Unspecified (12) _____

Drinking Problems

Official Report (13) _____

Self-Report (14) _____

Family/Friend Report (15) _____

Unspecified (16) _____

Comments:

DRINKING HISTORY (Con't.)Labelled Alcoholic

	<u>Measured</u> <u>N</u>
<input type="checkbox"/> History of Treatment/Diagnosis For Alcoholism (17)	_____
<input type="checkbox"/> Post-Event Hospital/Psychiatric Diagnosis (18)	_____
<input type="checkbox"/> Other Official Report (19)	_____
<input type="checkbox"/> Self-Report (20)	_____
<input type="checkbox"/> Family/Friend Report (21)	_____
<input type="checkbox"/> Drinking Practices/Problems(22)	_____
<input type="checkbox"/> Autopsy (23)	_____
<input type="checkbox"/> Unspecified (24)	_____

Other

Alcohol Discussed But No Alcohol Measure Specified _____

Alcohol Not Mentioned _____

CHECKLIST OF OTHER AVAILABLE EMPIRICAL INFORMATION

<u>Analyzed by Alcohol Involvement*</u>	<u>Not Analyzed by Alcohol Involvement</u>	<u>Demographic Variation</u>	<u>Additional Alcohol Information</u>
<u> </u>	<u> X</u>	Age	<u> </u> Full range BAC available
<u> X</u>	<u> X</u>	Race	<u> </u> Drinking Patterns (Where, When, With Whom)
<u> </u>	<u> </u>	Marital Status	<u> </u> Other Drug Involvement
<u> </u>	<u> </u>	Education	<u> </u> Other _____
<u> </u>	<u> </u>	Occupation/SES	
<u> </u>	<u> </u>	Religion	
<u> X</u>	<u> X</u>	Other <u> Sex</u>	
		<u>Temporal Variation</u>	<u>Other Personal Data</u>
<u> </u>	<u> X</u>	Time of Day	<u> </u> Psychiatric Diagnosis
<u> </u>	<u> X</u>	Day of Week	<u> </u> Medical Records
<u> </u>	<u> X</u>	Month	<u> </u> Personal History
			<u> </u> Criminal Records
		<u>Event</u>	<u> </u> Psychological, Attitudinal and Opinion Variables
<u> </u>	<u> X</u>	Relationship of Victim and Offender	
<u> </u>	<u> X</u>	Site of Crime:	<u>Type of Analysis</u>
<u> </u>	<u> </u>	Bar or Other Drinking Establishment	<u> X</u> One & Two Way Tables
<u> </u>	<u> </u>	Home	<u> </u> Three Way Tables
<u> </u>	<u> </u>	Other Site	<u> </u> Correlational Analysis
<u> </u>	<u> </u>	Social Area Information	<u> </u> Overtime Analysis
<u> </u>	<u> X</u>	Precipitating Events	<u> </u> Cross-National Analysis
<u> </u>	<u> X</u>	Weapon	<u> </u> Comparison of Two or More Sample Populations
<u> </u>	<u> </u>	Other _____	
			<u>Information on Other Casualties</u>
			<u> </u> Accidents
			<u> </u> Traffic
			<u> </u> Suicide
			<u> </u> Family Violence/Child Abuse

Additional Information Tables By Variables Not Mentioned Here

Comments:

Suicide

The literature on suicide is large, comprising studies that have focussed on various aspects of this problem in different societies over two centuries. It is a problem that has been written about from both a literary and scientific point of view, a problem with a wide range of legal, moral, psychological and sociological implications. There are several excellent summary sources that provide an introduction to this literature.

Alvarez's book, The Savage God (1973) is an excellent discussion of literary and cultural attitudes towards suicide in Western society; Dahlgren's study Suicide and Attempted Suicide (1945) provides a good summary of early scientific studies of the subject. Many of those studies were used by Durkheim in his classic Suicide (1897), which along with Freud's writings on the subject helped establish the basic theoretical orientation that still influences suicide research.

With growing interest in suicide study beginning in the 1950s and 1960s, many new works in the field have appeared. The Bulletin on Suicidology and its successor Suicide and Life Threatening Behavior are good sources for articles and reviews on this subject. There are very useful bibliographies of the vast suicide literature, notably Bibliography on Suicide and Suicide Prevention (1972), and David Lester's review of suicide research, Why People Kill Themselves (1972). A number of good anthologies are available, including Farberow and Schneidman The Cry for Help (1965); Jack Gibbs Suicide (1968); H. Resnik Suicidal Behaviors (1968) and A. Beck, H. Resnik and D. Lettieri The Prediction of Suicide (1974).

Such works are useful both as introductions to the field and as sources of some of the best theoretical and empirical studies on suicidal behavior.

Bibliographical sources identify thousands of studies on suicide and suicide attempts. From there, we were especially interested in the empirically based research that had data on the alcohol-suicide relation. As alcohol abuse has long been identified as a possible precursor to suicide, many studies have presented alcohol data of various kinds and degrees of comprehensiveness. Often there was very good data in some of the older studies, and we made an effort to include them in our searches. Much important research on suicide has been done in foreign countries. We tried to locate as many of the most important Scandinavian, English, Australian, Swiss, French and German studies as we could. In addition to studies noted in bibliographies of suicide, we also looked at studies of alcoholics, as suicidal behavior has been frequently noted among the samples studied. Mortality studies, as well, are a source of data.

Those empirical studies on suicide that provided useful alcohol related data were summarized on the suicide review forms. Studies of fatalities, completed suicides, were analyzed separately from suicide attempts. Samples of attempted suicides were usually obtained from hospital admission data, though there is also data on self-reported attempts in some studies. The characteristics of the sample are reported on the first page of the review form.

The items on the second page indicate the sources of the alcohol characteristics that are to be found in the studies. It is very important to differentiate between studies that report on the history of treatment and diagnosis for alcoholism in the sample that predates the suicidal act and those studies

that provide post event diagnoses. All too often the criteria for such diagnoses are not given, making it difficult to make comparisons between the alcohol involvement findings (pg. 3 on form) in the various studies.

The last page of the form suggests some of the other important information found in these studies. Many suicide studies, especially those of suicide attempters, provide a wealth of demographic, psychological and contextual data on their sample. Precipitating events and seriousness of intent are two variables that we frequently found in studies of suicide.

Suicidologists are often interested in details surrounding the suicidal act itself, suggesting those factors thought to have precipitated it, and in the cases of suicide attempts, determining how seriously the subject intended to die. We have tried to indicate for all the variables -- demographic, temporal, and event -- if there is data comparing the part of the sample labelled as alcohol abusers with the rest of the sample. Studies that do so in a few or in many variables are especially good sources for examining the possible relations between alcohol and suicidal behavior.

SUICIDE REVIEW FORMS INDEX

Form #/Source/Date

- 40-01-A, Tuckman and Lavell, 1958
- 40-02-A, Ritson, 1968
- 40-03-A, Glatt, 1954
- 40-04-A, Batchelor, 1954
- 40-05-A, Achte and Ginman, 1966
- 40-06-A, Chandler, Hensman, Edwards, 1971
- 40-07-A, Gorceix, Zimbacca, 1965
- 40-08-A, Ohara, 1972
- 40-09-A, Haberman and Baden, 1974
- 40-10-A, Kendell and Staton, 1966
- 40-11-A, Kessel and Grossman, 1961
- 40-11-B, Kessel and Grossman, 1961
- 40-12-A, Norvig and Nielsen, 1955
- 40-13-A, Ovenstone and Kreitman, 1974
- 40-14-A, Arieff, McCulloch, Rotman, 1948
- 40-15-A, Barraclough et al., 1974
- 40-16-A, James, Scott-Orr, Curnow, 1963
- 40-17-A, Morgan et al., 1975
- 40-18-A, Yessler, Gibbs, Becker, 1961
- 40-19-A, Schmid, 1933
- 40-20-A, Spain, Bradess, Eggston, 1951
- 40-21-A, Keller and Castanos, 1968
- 40-22-A, James, 1966
- 40-23-A, Buegsegger, 1963
- 40-24-A, Virkkunen and Alha, 1970
- 40-25-A, Patel, 1974
- 40-26-A, Bridges and Koller, 1966
- 40-27-A, Ripley, 1973
- 40-28-A, Daumezon, Cor, Rudrauf, 1955
- 40-29-A, Whitlock and Schapira, 1967
- 40-30-A, Bratfos, 1971
- 40-31-A, Ibsen, Moore, Alexander, 1952
- 40-32-A, Ciompi and Eisert, 1969
- 40-33-A, Krupinski, 1963
- 40-34-A, Robins et al., 1959b
- 40-35-A, Schneidman and Farberow, 1965
- 40-36-A, Palola, Dorpat, Larson, 1962
- 40-36-B, Palola, Dorpat, Larson, 1962
- 40-37-A, Lerch, 1959
- 40-38-A, Virkkunen, 1971
- 40-39-A, Attkisson, 1970
- 40-40-A, Schmidt, O'Neal, Robins, 1954
- 40-41-A, Epps, 1957
- 40-42-A, Edwards and Whitlock, 1968
- 40-43-A, Heller, 1900
- 40-44-A, Achte and Lonquist, 1971

SUICIDE REVIEW FORMS INDEX

Form #/Source/Date

40-45-A, Moore, 1939
40-46-A, Battagary, 1965
40-47-A, Beck, Weissman, Kovacs, 1976
40-48-A, Lemere, 1953
40-49-A, Farkerow and Simon, 1969
40-49-B, Farkerow and Simon, 1969
40-50-A, Weyman, Greenbaum, Grace, 1974
40-51-A, Gibbons and Plechus, 1965
40-52-A, Press, Walker, Crawford, 1968
40-53-A, Plueckhahn, 1972
40-54-A, Gay et al., 1970
40-55-A, Haberman and Baden, 1974
40-56-A, Haberman and Raden, 1974
40-57-A, Arner, 1973
40-58-A, Medhus, 1975
40-59-A, Phelps, 1911
40-60-A, Trunkey and Lim, 1974
40-61-A, Wilentz, 1953
40-62-A, Wilentz, 1953
40-63-A, Brenner, 1967
40-64-A, Pell and D'Alonzo, 1973
40-65-A, Nicholls, Edwards, Kyle, 1974
40-66-A, Schuckit and Gunderson, 1974
40-67-A, Schuckit and Gunderson, 1974
40-68-A, Ipsen, Moore, Alexander, 1952
40-69-A, Choi, 1975
40-70-A, De Lint and Levinson, 1975
40-71-A, Dahlgren, 1951
40-72-A, Davies, 1965
40-73-A, Menge, 1950
40-74-A, Schmidt and de Lint, 1972
40-75-A, Spain, Bradess, Eggston, 1951
40-76-A, Cutler and Morrison, 1971
40-77-A, Dijk and Dijk-Hoffeman, 1973
40-78-A, Nørvig and Nielsen, 1956
40-79-A, Ettliger and Flordh, 1955
40-80-A, Honkanen and Ottelin, 1976a
40-81-A, Honkanen and Visuri, 1976c
40-82-A, Deasy, Gerald, Dennis, 1973
40-83-A, Westermeyer and Bratner, 1972

SUICIDE REVIEW FORM

Form # 40-02-A

Article Reviewed On
Additional Form

Citation: Ritson, E.R.

1968 "Suicide amongst alcoholics." Br. J. Med. Psychol., Vol. 41,
pp. 235-242.Sample Population

- Fatalities
 Attempted Suicides
 Alcoholics
 General Population

Data Type

- Original Data
 Reanalysis Of Existing Data
 Unknown

Base of Sample Selection

- Coroner's Report
 Hospital Admissions/Records
 Alcoholic Organization/Treatment
 Facility
 Other _____
 Unspecified

Author/Agency

- Suicide Agencies
 Coroner
 Epidemiologist/Public Health
 Psychiatrist/Psychologist
 Other _____
 Unspecified

Sample Description: Among the first 300 patients admitted to an alcoholism treatment center, 8 committed suicide. The characteristics of these eight are described in detail, and are compared with another group of 16 non-suicidal alcoholics admitted at the same time.

Sample ParametersLocation (City/State/County): Edinburgh, ScotlandDate Of Data Collection (Month/Year): 1965Follow-Up Period: 9 mo. - 2 yr.Sample Restrictions

- Age Restrictions _____
 Race Restrictions _____
 Men Only
 Women Only
 Other _____

ALCOHOL MEASURE

<u>ALCOHOL USE AT TIME OF EVENT</u>	Measured <u>N</u>	<u>DRINKING HISTORY (Con't.)</u>	Measured <u>N</u>
<u>BAC/BAL/UAC (1)</u>	_____	<u>Labelled Alcoholic</u>	
<u>Police Report (2)</u>	_____	<input checked="" type="checkbox"/> <u>History of Treatment/Diagnosis</u>	<u>300</u>
<u>Other Official Report (3)</u>	_____	<u>For Alcoholism (16)</u>	
<u>Self-Report (4)</u>	_____	<u>Post-Event Hospital/Psychiatric</u>	_____
<u>Family/Friend Report (5)</u>	_____	<u>Diagnosis (17)</u>	
<u>Unspecified (6)</u>	_____	<u>Other Official Report (18)</u>	_____
		<u>Self-Report (19)</u>	_____
<u>DRINKING HISTORY</u>		<u>Family/Friend Report (20)</u>	_____
<u>Autopsies (7)</u>	_____	<u>Drinking Practices/Problems (21)</u>	_____
		<u>Autopsy (22)</u>	_____
<u>Quantity/Frequency</u>		<u>Unspecified (23)</u>	_____
<u>Official Report (8)</u>	_____		
<u>Self-Report (9)</u>	_____	<u>Other</u>	
<u>Family/Friend Report (10)</u>	_____	<u>Alcohol Discussed But No Alcohol</u>	_____
<u>Unspecified (11)</u>	_____	<u>Measure Specified</u>	
		<u>Alcohol Not Mentioned</u>	_____
<u>Drinking Problems</u>			
<u>Official Report (12)</u>	_____		
<u>Self-Report (13)</u>	_____		
<u>Family/Friend Report (14)</u>	_____		
<u>Unspecified (15)</u>	_____		

Comments:



ALCOHOL INVOLVEMENT FINDINGS

<u>Total Events</u>	<u>Sample N</u>	<u>Completed Suicides</u>	<u>Base N of Alcohol Analysis</u>	<u>Drinking N</u>	<u>History %</u>	<u>Drinking @ Time N</u>	<u>Drinking @ Time %</u>	<u>Alcohol Measure*</u>
_____	_____	Men	_____	_____	_____	_____	_____	_____
_____	_____	Women	_____	_____	_____	_____	_____	_____
_____	_____	Total	_____	_____	_____	_____	_____	_____
_____	_____	<u>Attempted Suicides</u>	_____	_____	_____	_____	_____	_____
_____	_____	Men	_____	_____	_____	_____	_____	_____
_____	_____	Women	_____	_____	_____	_____	_____	_____
_____	_____	Total	_____	_____	_____	_____	_____	_____

<u>Total Events</u>	<u>Sample N</u>	<u>Labelled Alcoholics</u>	<u>Base N of Alcohol Analysis</u>	<u>Total Suicides</u>		<u>Drinking @ Time N</u>	<u>Drinking @ Time %</u>	<u>Alcoholic Measure*</u>
_____	_____	Men	_____	<u>Completed</u>	6	_____	_____	_____
_____	_____	Women	_____		2	_____	_____	_____
_____	300	Total	300		8	3%	_____	16
_____	_____		_____	<u>Attempted</u>	_____	_____	_____	_____
_____	_____	Men	_____		_____	_____	_____	_____
_____	_____	Women	_____		_____	_____	_____	_____
_____	_____	Total	_____		_____	_____	_____	_____

* Code 1 through 23 from alcohol measure list. If BAC, list level used.

702

CHECKLIST OF OTHER AVAILABLE EMPIRICAL INFORMATION

<u>Analyzed By Alcohol Involvement</u>	<u>Not Analyzed By Alcohol Involvement</u>	<u>Demographic Variation</u>	<u>Additional Alcohol Information</u>
<u>X</u>	—	Age	— Full Range BAC Available
—	—	Race	— Drinking Patterns (Where, When, With Whom)
<u>X</u>	—	Marital Status	— Other Drug Involvement
—	—	Education	— Other _____
<u>X</u>	—	Occupation/SES	
—	—	Religion	
—	—	Other _____	<u>Other Personal Data</u>
			— Psychiatric Diagnosis
			— Medical Records
		<u>Temporal Variation</u>	<u>X</u> Personal History
—	—	Time Of Day	— Criminal Records
—	—	Day Of Week	<u>X</u> Psychological, Attitudinal
—	—	Month	And Opinion Variables
		<u>Event</u>	<u>Type of Analysis</u>
—	—	Seriousness Of Intent	<u>X</u> One And Two Way Tables
<u>X</u>	—	Methods Of Suicide	— Three Way Tables
<u>X</u>	—	Precipitating Events	— Correlational Analysis
<u>X</u>	—	Other History of	— Overtime Analysis
—	—	<u>Previous Attempts</u>	— Cross-National Analysis
			<u>X</u> Comparison Of Two Or More
			Sample Populations
			— Response-Rate Information
<u>Additional Information</u>			<u>Information On Other Casualties</u>
— Tables By Variables Not Mentioned Here			— Accidents
— Historical Perspective			— Traffic
			— Crime
			— Family Violence/Child Abuse
			— Juvenile Delinquency
<u>Comments:</u>			

Family Abuse

The general title "Family Abuse" covers several specific serious events: "child abuse" refers to physical injuries inflicted on children by their caretakers; "child neglect" refers to failures on the part of parents or other caretakers to perform such expected functions as nurturance, protection, or supervision; "child molesting" is reserved for the sexual abuse of children by adults; "marital violence" refers to physical aggression between husbands and wives.

In keeping with the distinctions between types of serious events, articles in the area of family abuse have been abstracted on two types of review forms. Studies of child molesting, reflecting their criminological tradition, have been reviewed on the Crime Review Form (see above discussion of this form). All other types of studies have been reviewed on the Family Abuse Review Form. Under the heading "Sample Population(s)" child abuse refers to both child neglect and child abuse (often not differentiated in the literature). The category "children of alcoholics" refers, as would be expected, to samples of children with alcoholic parents.

Although the literatures that make up the area of family abuse are quite substantial, the empirical data on the involvement of alcohol in the events is limited. Thus the small number of review forms in this area. What limited

information that is available on alcohol involvement is often vague and based on extremely varied types of samples. The open-ended coding of the items recording information on the sample descriptions and restrictions reflects this variation.

This ambiguity in sample definitions and alcohol involvement reporting is also reflected on page 3 of the review form in the section on "Alcohol Involvement Findings" (Types I and II research). Under "Child Abuse" there are a variety of sample types. A review of these categories reveals that alcohol-involvement findings are variably reported for parents of abused children (including both the abusive parent and the non-abusive parent), for only abusive parents or for all child abusers (including parents and other caretakers). In addition, the terms "cases" of child abuse and "families" involved in child abuse often appear in the literature without specification as to whether more than one child is abused in a family or whether a case N of child abuse includes more than one child abused by the same parent(s). Thus, although all available information on the sample is recorded on the review form, ambiguity may still remain.

A special coding system has been used on page 4 in the "Checklist of Other Available (Empirical) Information." Codes, described in the comment section on the bottom of page 4 of every form in which they are used, differentiate whether the available information refers to abusers or their child victims, to husbands or wives, or to children of alcoholics or to their alcoholic parents.

FAMILY ABUSE REVIEW FORM INDEX

Form #/Source/Date

50-01-A, Andreini and Greene, 1975 50-23-A, Booz-Allen and Hamilton, 1974

50-02-A, Scott, 1973

50-03-A, Nau, 1967

50-04-A, Gelles, 1972

50-05-A, Johnson and Morse, 1968

50-06-A, Young, 1964

50-07-A, Gayford, 1975

50-08-A, Lemert, 1970

50-09-A, Chafetz, Blane, Hill, 1971

50-11-A, Scientific Analysis Corp., 1976

50-12-A, Gil, 1973

50-13-A, Gould, 1976

50-14-A, Bard and Zacker, 1974

50-15-A, Cork, 1969

50-16-A, Gebhard et al., 1965

50-17-A, Henn et al., 1976

50-18-A, Frisbie, 1969

50-19-A, McCaghy, 1968

50-20-A, Wilschke, 1965

50-21-A, Rada, 1976

50-22-A, Swanson, 1968

Citation: Young, Leontine

1964 Wednesday's Children. New York: McGraw-Hill.

Sample Population(s)

- Marital Violence
- Child Abuse
- Children of Alcoholics

Author/Agency

- Social Workers
- Social Scientists/Psychologists
- Medical Practitioners
- Epidemiologists/Public Health
- Alcohol Researchers
- Police Personnel
- Other _____
- Unspecified

Sample Description: Sample consists of two studies. The first study is only exploratory and involves 40 families each from active case files of two public child welfare agencies in two counties suburban to a large eastern metropolitan area and 40 additional families from the active case file of one private agency in the city that handles only cases of neglect and abuse. The second study of 180 families covers two rural areas in the Midwest, two medium sized cities (150,000-500,000) in the Midwest, one large urban area (greater than 1,000,000) in the Midwest, one medium sized city on the Pacific coast, and one rural area on the Pacific coast. Except for the large city in this sample all families came from the files of public child welfare departments. The families from the larger city came from the files of a private agency handling only cases of child neglect and abuse. All information was gathered by caseworkers.

Sample Restrictions:

ALCOHOL MEASURE

<u>ALCOHOL USE AT TIME OF EVENT</u>	<u>Measured</u> <u>N</u>
<input type="checkbox"/> BAC/BAL/UAC (1)	_____
<input type="checkbox"/> Police Report (2)	_____
<input type="checkbox"/> Other Official Report (3)	_____
<input type="checkbox"/> Self-Report (4)	_____
<input type="checkbox"/> Family/Friend Report (5)	_____
<input type="checkbox"/> Unspecified (6)	_____

DRINKING HISTORY Autopsies (7)Quantity/Frequency Official Report (8) Self-Report (9) Family/Friend Report (10) Unspecified (11)Drinking Problems Official Report (12) Self-Report (13) Family/Friend Report (14) Unspecified (15)DRINKING HISTORY (Con't.)Labelled Alcoholic History of Treatment/Diagnosis For Alcoholism (16) Post-Event Hospital/Psychiatric Diagnosis (17) Other Official Report (18) Self-Report (19) Family/Friend Report (20) Drinking Practices/Problems (21) Autopsy (22) Unspecified (23)Other Alcohol Discussed But No Alco-
hol Measure Specified Alcohol Not MentionedComments:

Other official reports (18) are caseworker reports

Alcoholics/Problem Drinkers Mentioned As Separate Group, But No Empirical Analysis Analyzed As Separate Group

ALCOHOL INVOLVEMENT FINDINGS

<u>Total N</u>	<u>Sample N</u>	<u>Sample Type</u>	<u>Base N of Alcohol Analysis</u>	<u>Drinking @ Time</u>		<u>Alcohol Measure*</u>	<u>Drinking History</u>		<u>Alcohol Measure*</u>
				<u>N</u>	<u>%</u>		<u>N</u>	<u>%</u>	
		<u>Marital Violence</u>							
		Cases							
		Families							
		Husbands/Men							
		Wives/Women							
		Other							
		<u>Child Abuse</u>							
		Cases							
	300	Families							
		Fathers							
		Mothers							
	496	Parents (Abusers and Non-Abusers)					186	38%	18
		Parents (Abusers Only)							
		Abusers (Par- ents and Other Caretakers)							
		Men							
		Women							
		<u>Children of Alcoholics</u>							
<u>Base N</u>	<u>%</u>	History of Emotional Neglect							
		History of Physical Abuse							

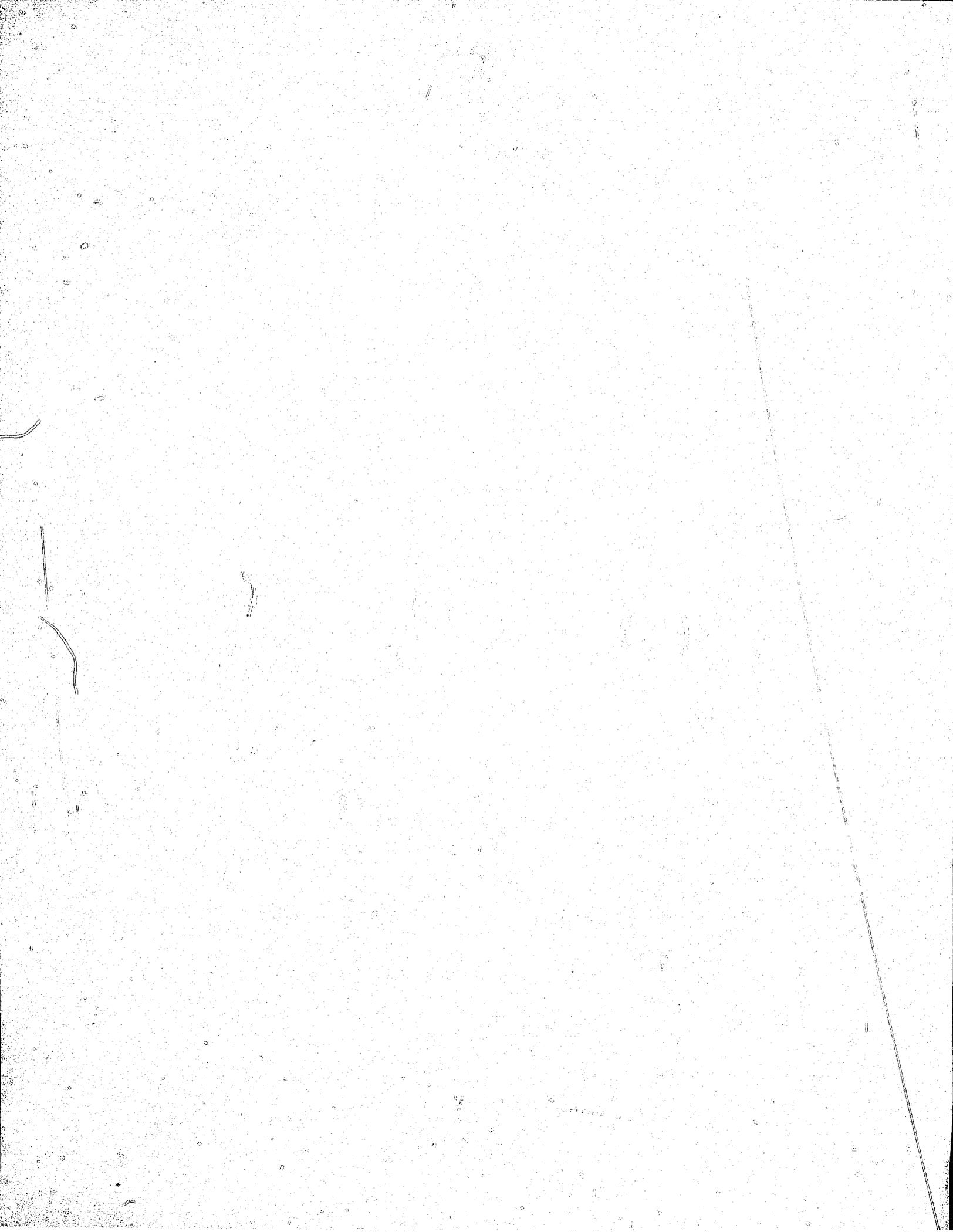
Comments: "One Hundred and Eighty Six parents were severe and chronic drinkers and their drinking constituted a primary family problem." Other parents did drink heavily, but this was not designated as a primary family problem.

* Code 1 through 23 from alcohol measure list.
If BAC, list level used.



CHECKLIST OF OTHER AVAILABLE (EMPIRICAL) INFORMATION

<u>Analyzed By Alcohol Involvement</u>	<u>Not Analyzed By Alcohol Involvement</u>	<u>Demographic</u>	<u>Additional Alcohol Information</u>
—	—	Age	— Full Range BAC Available
—	—	Sex	— Drinking Patterns (Where, When, With Whom)
—	X	Race/Ethnicity	— Drinking/Accident Time Sequence
—	X	Marital Status	— Other Drug Involvement
—	X	Education	— Other _____
—	X	Occupation/SES	
—	X	Religion	
—	X	Number of Children	
—	—	Other _____	
		<u>Temporal Variation</u>	<u>Other Personal Data</u>
—	—	Time of Day	— a History Of Abuse As Child
—	—	Day Of Week	X Quality of Life
—	—	Month/Season	— Recent Stress
		<u>Event</u>	a Personality Profile
—	X	Severity Of Violence/Abuse	c,a Psychiatric Record
—	—	Detailed Information	— Medical Record
—	—	Frequency Of Event	c,a Criminal Record
—	—	Location Of Event	X Other <u>isolation from community</u>
—	—	Other _____	
		<u>Additional Information</u>	<u>Type Of Analysis</u>
—	—	Tables By Variables Not Mentioned Here	X One And Two Way Tables
—	—	Historical Perspectives	— Three Way Tables
		<u>Comments:</u>	X Correlational Analysis
—	—	"c" refers to child	— Over-Time Analysis
—	—	"a" refers to abuser	X Cross-National Analysis
			X Comparison Of Two Or More Sample Populations
			X Comparison To General Population
			— Response-Rate Information
			<u>Information On Other Casualties</u> N
			— Accidents _____
			— Traffic _____
			X Crime 112 parents
			— Suicide _____
			X Juvenile Delinquency 71 children



END