

REHABILITATION OF THE DRUNKEN DRIVER  
IN THE UNITED STATES:  
AN EVALUATION OF THE APPROACH USED BY  
THE PHOENIX, ARIZONA ALCOHOL SAFETY ACTION PROJECT

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Thomas R. Clay

City of Phoenix  
Alcohol Safety Action Project  
251 West Washington Street  
Phoenix, Arizona 85003 U.S.A.

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T. R. CLAY

THE ASAP APPROACH

It has been ten years since the United States Department of Transportation issued its 1968 report on alcohol and highway safety (1). That report, which claimed alcohol as a factor in 50% of all fatal motor vehicle crashes, was the impetus for development of the Alcohol Safety Action Program (ASAP). Between 1970 and 1976, ASAPs were implemented and evaluated in 35 locations around the country. Although these projects shared a systems approach, the structure and content of their countermeasure activities varied greatly. This diversity should be viewed as a healthy adaptation of national program goals to local conditions. Nevertheless, differences among ASAP sites complicated the production of national evaluation reports (2). Program-level analyses, while providing much of value, have suffered from two inherent limitations. First, development of a national data base was hampered by the multiplicity of treatment variables and outcome measures used in local projects. Second, many ASAPs were plagued with inadequate experimental designs which precluded a definitive assessment of treatment effectiveness. For these reasons, it is instructive to examine the experience of a single ASAP site: Phoenix, Arizona.

PROGRAM OVERVIEW

Community Description

Phoenix, capitol city of the state of Arizona, is located in the southwestern part of the country. Situated in a large valley with mountains rising to the north and south, the city is typified by dry and warm climatic conditions. Phoenix covered a 277 square mile area at the end of 1976, and had a population of 675,000. The legal drinking age was lowered from 21 to 19 in 1972. Public drunkenness was abolished as a crime in 1974.

State law specified a .10% blood alcohol concentration as constituting presumptive evidence that a driver was under the influence. First conviction of driving while intoxicated (DWI) resulted in a mandatory imprisonment of one day (and up to six months), and a fine of up to \$300. A subsequent conviction within 24 months carried a much stiffer sanction: mandatory imprisonment for 60 days (and up to six months), and a fine of \$300. Suspension of driving privileges was discretionary for first offenders but mandatory for second offenders. Under the Implied Consent law, a six-month license suspension was imposed if the defendant refused to submit to a blood alcohol test.

The Phoenix ASAP

The City of Phoenix Alcohol Safety Action Project was operational from 1972 to 1976. Funding was a blend of City and Federal monies, with \$3.2 million contributed by the U. S. Department of Transportation. Revenues generated from client fees helped support alcohol treatment programs, and many community agencies provided services at reduced cost. Besides rehabilitation, the ASAP featured increased DWI enforcement, judicial and public information activity. Provision was also made for management and evaluation of the program. The overall objective was to achieve a significant reduction in alcohol-related traffic accidents.

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ACQUISITIONS

Evaluation of this project represents one of the most extensive and sustained attempts that has yet been made to determine the effectiveness of countermeasures against drunken driving. The experimental design was carefully developed to surmount the constraints imposed by doing research in a real-world context. Random assignment of DWI offenders to short-term treatment programs made it possible to assess rehabilitation effectiveness in terms of both arrest recidivism and other behavioral criteria relating to "client life status." To a large extent, this evaluation design overcame the deficiencies noted in earlier Federal studies of ASAP rehabilitation programs (3,4). Although it was not possible to document crash reduction (5), evidence of project impact was demonstrated by use of secondary indicators. The effectiveness of individual countermeasures must be considered in assessing the worth of the total program (6).

Before turning to the primary subject of this paper--evaluation of alcohol treatment programs--results of enforcement, judicial and public information activities will be briefly highlighted. This will help put ASAP rehabilitation in the proper context as one element of a total systems approach to the DWI problem (7).

#### ENFORCEMENT AND JUDICIAL OPERATIONS

With regard to enforcement, there is no doubt that success was achieved in meeting countermeasure objectives (8). Given a sizeable allocation of police resources, DWI arrests climbed 60% in the first year. A record 11,729 citations were written in 1976. (See Figure 1.) Rotation of a ten-officer motorcycle squad around the city revealed that this relatively high rate could be boosted even further--in 1976, for example, arrests jumped 277% when ASAP officers were present in a patrol sector. This suggests that detection procedures ordinarily brought only the most obvious cases to the attention of the police. The probability of arrest for DWI was actually quite low--despite the apparently high level of enforcement. The driving public was aware of this situation. Even though ASAP publicity emphasized enforcement activity (9), less than one-third of the respondents in a household survey estimated the apprehension risk to be high. This indicates that general deterrence of drunken driving will not occur without a much more substantial, well publicized jump in the DWI arrest rate.

The sharp rise in DWI arrests initially strained the ability of the judicial system to process the case load. But the long-term effect was to prod the Court and Prosecutor's Office into judicial reform (10). In response to a deteriorating situation, a diversion program was developed in 1974 under the sponsorship of ASAP. Known as Prosecution Alternative to Court Trial, or PACT, the program allowed DWI offenders to plea bargain for a lesser charge if an alcohol rehabilitation assignment was completed. Objectives of this program were clearly met. The trial backlog was eradicated. Referrals to rehabilitation doubled in number and were made 71% faster. Ultimately, of course, the worth of PACT as a referral device is dependent on the value of the treatment modalities in modifying DWI behavior.

#### EVALUATION OF ASAP REHABILITATION

##### Why Evaluation?

Although there is consensus that social intervention is needed to reduce the number of alcohol-related traffic casualties, there is considerably less agreement on how to best combat the problem. The traditional approach has been to impose legislatively

mandated sanctions, such as fine, jail and driver's license suspension. More recently, treatment programs have been developed in an attempt to modify the behavior of DWI offenders. One of the earliest programs was begun in Phoenix, Arizona in 1966. DWI Phoenix has served as the prototype for hundreds of similar programs in this country and others (11). From the very beginning, an attempt was made to evaluate this program and its offshoots in other communities (12). Unfortunately, evaluation efforts were largely confined to pencil and paper tests of knowledge and attitude change (13,14). Exigencies of doing research in the real world precluded more direct assessment of program effectiveness, such as a study of crash or arrest recidivism rates. Nevertheless, favorable reports on DWI Phoenix were widely disseminated to a receptive clientele of lower courts wanting to do something about the drunken driver problem. DWI Schools mushroomed. Yet many of these programs included no mechanism at all for evaluation, and almost none had experimental designs which were able to rise above organizational and budgetary constraints. An opportunity finally occurred in 1972 to rigorously evaluate DWI countermeasures in Phoenix, including the original DWI School, when the city was selected as an ASAP site.

### DWI School Recidivism

Over the years, a variety of treatment options existed to which ASAP referrals could be made (15). From January, 1972 to June, 1974, the Phoenix DWI School was offered through the Extension Division of Arizona State University. All persons, regardless of drinker screening, were directed to some phase of this countermeasure. According to the random assignment design, 60% of the referral population attended a four-session, ten-hour lecture course; 20% attended a one-session, 2½ hour presentation based on the four-session curriculum; 15% were given the same take-home literature that was distributed to the above two groups, but attended no lectures; and 5% were assigned to a control group which did not attend lectures or receive literature.

Treatment effects were assessed in terms of DWI arrest recidivism. The reason for using recidivism is that, indirectly at least, it reflects behavioral change by determining how many persons fail to respond to treatment and receive a repeat DWI citation (16). The major advantage is that actual behavior is measured. Knowledge, attitude and opinion questionnaires suffer greatly by comparison, since people may claim to have changed when in fact they have not.

Recidivism data were examined through the method of survival rate analysis. This technique was borrowed from the field of medical pathology, where survival has long been used as a criterion for measuring the effectiveness of cancer therapy (17). The method considers a given therapy as more effective if patients exposed to it experience significantly greater survival than those exposed to alternative treatments. Survival rate, therefore, is simply one minus the recidivism rate. The method has the advantage of using recidivism data for persons with follow-up for less than the total time being considered. The assumption is made that the survival experience of persons with shorter exposure is similar to that of persons remaining under follow-up. Significance for statistical testing was set at the .05 level (one-tailed tests).

Data were obtained through a complex computer program from the ASAP master file of DWI records. The sample size varied, depending on the length of the follow-up period: four-session school (2309-3848), one-session school (545-1147), literature (522-1084), control (222-275). Recidivist (rearrest) frequencies were plotted by quarter of occurrence and previously-entered treatment modality. An individual was counted as a recidivist only once against any given treatment. The total number of rehabilitation referrals were counted, including persons who failed to enter or dropped out

of treatment. This was done to preserve the integrity of the random assignment design, despite the possibility of masking positive results which might have been obtained by considering only persons benefiting from the entire course of rehabilitation. In order to eliminate this as an explanation for negative results, analyses were rerun using only those persons who had completed their treatment assignment.

Each of the four randomly assigned DWI School groups was compared with one another. The hypothesis was that survival would be maintained in direct relation to the amount of treatment exposure, i.e., in this order: four-session, one-session, literature only, no-treatment control group. Persons who received a further rehabilitation referral were excluded from the analysis, since this would confound the School effect.

Cumulative survival rates were comparable for the four-session, one-session and literature groups. (See Figure 2.) Statistical analysis revealed that survival for the no-treatment control group was significantly lower than any of the treatment groups at almost every quarter following treatment entry. None of the other comparisons achieved statistical significance. Survival after five years (20 quarters) was highest for the four-session group (76.1%), followed by the one-session (75.8%), literature (73.8%) and control (69.4%) groups.

These results give a fairly clear indication that some form of DWI School exposure produced higher survival than no treatment at all. Furthermore, it would appear that a one-session group or educational literature reduced recidivism as much as four sessions of the DWI School. The inferior performance of the four-session group is difficult to reconcile. The experimental hypothesis was that treatment effectiveness would manifest itself in direct relation to the length of exposure, especially since the substance of the one-session and literature groups was based on the four-session curriculum. Although the groups were ranked in the hypothesized order after five years, differences in survival were slight and not statistically significant. Furthermore, the ranking for all but the control group fluctuated over time; after one year, for example, survival was higher for the literature group (90.5%) and lower for the four-session group (89.1%).

It does not appear justified to explain the results on the basis of selection bias, not only because problem and social drinkers were referred to each group, but also because persons were randomly assigned. A check on the profile of those completing the DWI School revealed no significant differences between groups on the variables of sex, age, origin, occupation, or breath test reading. Survival rates remained essentially unchanged when computations included only persons who actually completed treatment.

#### Alcohol Awareness Program Recidivism

From July, 1974 to December, 1976, several innovative Alcohol Awareness modalities were administered by the Rehabilitation-Probation Center, a division of the City Court. Unlike the DWI School, persons were referred to treatment on the basis of problem/social drinker diagnosis. Random assignment was limited to nine months of 1975. During this period, following initial drinker screening, approximately 80% were randomly assigned to treatment, while 20% were assigned to a minimal-exposure Home Study Course (18). This comparison modality consisted of a single 30 minute session when a 32 page learning guide was distributed.

Most Alcohol Awareness Program referrals were made to one of three modalities. DWI Prevention Workshops, a four-session, ten-hour program designed for social drinkers, used a semi-structured group process to impart information concerning alcohol and its effect on driving and interpersonal relationships. DWI Therapy Workshops, a six-session, 15-hour program (plus exit/evaluation interview) designed for problem drinkers, included educational aspects but emphasized small group interaction and confrontation to develop personal awareness. Power Motivation Training, a 32-hour program designed for problem drinkers, employed a series of experiential exercises to give participants feedback on their level of risk-taking, strategies of goal setting and quality of interpersonal communication in stressful situations (19).

Treatment effects were assessed through survival rate analysis in the same way as for the DWI School. Once again, sample size varied according to the length of the follow-up period: Prevention Workshops (2555-3080), PW Home Study (550-760), Therapy Workshops (1087-1144), TW Home Study (308-344), Power Motivation Training (100-102), PMT Home Study (87-112).

Each of the three randomly assigned Alcohol Awareness treatment modalities was compared with its corresponding Home Study Course group. The hypothesis was that survival would be higher for the treatment groups. Persons who received additional treatment were included in the analysis, since this was an integral part of the referral mechanism.

Diagnosed social drinkers referred to Prevention Workshops or Home Study achieved virtually identical results, with survival rates differing by approximately 1%. (See Figure 3.) Survival after two years was slightly higher for Prevention Workshops (90.1%) compared to Home Study (88.8%). Statistical testing verified that the two curves were not significantly different at any of the periods following entry.

Diagnosed problem drinkers assigned to Therapy Workshops or Home Study experienced very similar survival, differing by less than 1% at all quarters following entry. (See Figure 4.) After two years, Therapy Workshops had a survival rate of 84.2% compared to 83.5% for Home Study, but statistical testing confirmed that the rates were not significantly different at any of the periods following treatment exposure.

Survival rates for diagnosed problem drinkers referred to Power Motivation Training or Home Study were more variable than the previous two comparisons because of the relatively small sample sizes. (See Figure 5.) This produced larger standard errors, resulting in no significant differences between the modalities, despite a 2.6% greater rate of survival for Home Study after two years.

Results for the three Alcohol Awareness modalities are most noteworthy for the marked similarity in Home Study survival which was observed at every time period following entry. These findings are viewed with confidence since persons were randomly assigned. A check on client profiles confirmed that random assignment had the desired effect of controlling between-group differences, at least for the variables of sex, age, origin, occupation, breath test reading, and arrest booking/release decision. As with the DWI School analysis, survival rates were unchanged when computations included only persons who completed treatment.

Differences in cumulative survival between the four-session DWI School and the Alcohol Awareness Program were also assessed. (See Figure 6.) The hypothesis was that survival would be greater for the new modalities. Somewhat higher survival was

achieved for persons entering an Alcohol Awareness modality (88.5% vs. 85.2%, after two years), with a small but discernable trend toward a larger spread as time after entry increases. Small percentage differences attained statistical significance due to the very large sample sizes. As in earlier comparisons, restricting the analysis to treatment completions did not alter the result.

Despite these negative results, it can be argued that the recidivism technique is too insensitive to detect small differences between treatment and comparison groups. Although an important criterion for evaluation of a traffic safety program, recidivism is subject to a number of measurement problems which restrict its utility. Furthermore, arrest data do not account for other client behaviors which alcohol treatment programs are typically intended to modify.

### Follow-Up Interview Results

To provide a more comprehensive evaluation of treatment effectiveness, the Short-Term Rehabilitation (STR) study was implemented at 11 ASAP sites in 1975 (20). In Phoenix, the STR sample was a subset of a much larger group of randomly assigned clients who were tracked on DWI arrest recidivism. An extensive data collection package was constructed especially for this study, although its development relied heavily on several earlier research efforts (21,22). Both personal interviews and self-administered questionnaires were used. Scales derived from these instruments closely correspond to the outcome measures utilized in the Rand evaluation of National Institute on Alcohol Abuse and Alcoholism (NIAAA) treatment programs (23).

Creation of scale scores was accomplished by the national STR evaluator, with adaptations for local use (24). The analytic method depended on the nature of the sample. Baseline data were collected on 351 DWI offenders referred to Prevention Workshops, Therapy Workshops, Power Motivation Training, or the Home Study Course. With two follow-up points (at six and twelve months), a multivariate analysis of variance approach was used. An adaptation of the STR design was used locally for 436 clients referred to Prevention Workshops, Therapy Workshops or Home Study. This portion of the study was termed STRIP, for STR In Phoenix. Less data were collected on this sample and there was only one contact made (after eight months). With only one follow-up, a repeated measures univariate analysis of variance was used. In all analyses, data were examined scale by scale. Attrition averaged 27% for both samples, a relatively low rate compared with other studies (25).

A detailed explanation of methodology and results is beyond the scope of this presentation. The overall conclusion, however, is that treatment programs had no more effect than the Home Study Course in improving the life situations of social or problem drinkers. In the STR study, negative results were obtained in the analysis of 15 scales measuring problems associated with alcohol use, physical health, employment stability, family status and social interaction. Analysis of 12 additional scales relating to personality traits/states also produced negative findings. Building on the STR research design, the STRIP study included a larger and more diverse sample of DWI offenders. As with STR, however, analysis of five scales measuring similar behavioral problems failed to indicate that exposure to treatment significantly altered life situations.

One interesting finding to emerge from the data was that a number of time main effects achieved statistical significance. More often than not, clients improved on their baseline performance. Unfortunately, it cannot be concluded that the improvement was the result of the intervention itself. It appears just as likely that external variables affected the internal validity of the experimental design (26).

To illustrate these findings, two of the scales will be described in some detail. STR Scale VI (from the Life Activities Inventory) is determined by six salient variables which are indicative of consequences of excessive drinking behavior. (See Figure 7.) High scores on this scale reflect self reports of relatively more immoderation. Therefore, improvement would be shown if scores were lowered over time, that is, the scale has a negative valence. Inspection of the groups' mean performance at each time interval indicates dramatic improvement in immoderate drinking behavior for all three groups from baseline to six months, with a slight slippage in group performance from the six to twelve month period. Also, there seems to be a trend toward greater improvement for the two treatment groups on this index.

STRIP Scale III is defined by 11 items which pertain to self reports of health related problems. (See Figure 8.) Since high scores are indicative of a substantial number of reported health problems, this scale is also negatively valenced. Once again, the test of interaction was found to be non-significant, indicating that mean number of physical complaints was similar over time for treatment and comparison groups. Another significant time main effect was obtained, with fewer reported problems for all groups at follow-up compared to initial contact. The two problem drinker curves are indicative of relatively more physical health complaints at both testing periods (they are more elevated), but with more improvement shown (they have slightly steeper slopes).

## CONCLUSIONS

### Summary and Discussion

Taken together, these analyses provide considerable evidence that Phoenix ASAP rehabilitation programs were largely ineffectual in reducing DWI arrest recidivism and alcohol-related problems. Nevertheless, as with any research focused on social intervention in the real world, several caveats could be added. While these may lead to the consideration of alternative explanations for the results, none is sufficient to overcome the overall negative conclusion.

The major problem concerns the adequacy of the control group. The experimental design for the DWI School included only a five percent control group, and legal restrictions precluded any no-treatment assignments for evaluation of the Alcohol Awareness Program. Instead, a minimal-exposure program was developed to test the effectiveness of the more extensive treatment. Unfortunately, this comparison group very likely resembled weak treatment more than a pure control. The recidivism results for the DWI School suggest this, both in terms of the inferior performance of the control and the fact that the literature group fared about as well as the four-session and one-session groups.

In the same vein, the strong showing by the Home Study Course in comparison to treatment programs can be cast in either a positive or negative light. It may be that when people are forced to read material in sufficient detail to answer written questions, they benefit as much as they do from exposure to a series of workshop sessions. If this is true, we may have learned something new about the way DWI behavior can be modified. The pessimist, taking the opposite view, would point out the very real possibility that treatment programs did not set a very high standard for the Home Study Course to match. Acceptance of this viewpoint would suggest that major alterations be made to the DWI rehabilitation system.

## Options for Program Planning

Rather than invoke design limitations to explain away negative findings, it would be better to admit that failures occurred and explore other avenues of approaching the problem. Three distinct options exist for DWI program planning.

One option would be to terminate all rehabilitation modalities and rely exclusively on punitive sanctions. The problem with this solution is that it shows even less promise as a deterrent to drunken driving. Stiff fines, jail and driver's license suspension have not lived up to their widely publicized claims of effectiveness, according to a number of carefully researched studies (27). The widespread belief in the deterrent effect of the Swedish and Norwegian laws, for example, has little solid support (28). Britain's experiment with harsher penalties did not meet with continued success, probably because there was little real increase in the likelihood of arrest and conviction (29).

Even if effectiveness could be demonstrated, greater reliance on punitive sanctions might be impractical. While a cogent argument can be made for the general deterrence afforded by intensive DWI enforcement and prosecution (30,31), this approach has never been put to a fair test. Even at an annual rate of 10,000 arrests in Phoenix, evidence exists that the surface was only being scratched. Furthermore, if DWI defendants really expected to go to jail or have their license suspended, many more would plead not guilty and demand jury trials. This would require a vastly increased investment in judicial resources.

A simpler and possibly more realistic solution might be to stick with the status quo and redefine rehabilitation objectives to embrace only those goals which could be met. Gains in knowledge and attitude might be enough to maintain public support, particularly in the absence of alternative approaches. Even with self-support in the form of client fees, though, programs with such limited goals might find it difficult to stay afloat. The hitch is that knowledge and attitude gains may not translate into behavioral change (32). Furthermore, the costs incurred in program operation must be weighed against the relative merit of the treatment. The Home Study Course, at less than \$6 per person, was by far the least expensive modality to operate. Prevention Workshops (\$23), Therapy Workshops (\$52) and Power Motivation Training (\$77) were much more costly. Considerable savings could be achieved at no measurable decrement in effectiveness if more referrals were made to a minimal-exposure modality such as the Home Study Course.

This suggests that the best course of action would be to systemically develop and test a different mix of programs. The "state of the art" in DWI rehabilitation is such that many innovative approaches remain to be put to the test of rigorous evaluation. Rather than expending energy in defense of current programs, it would be more beneficial to try again. There is little to lose by continuing to experiment and the potential gain makes the attempt worthwhile. Phoenix city officials originally took this tack in discontinuing the DWI School and Power Motivation Training, and in modifying the Home Study Course for use as a regular treatment modality. Political considerations are inhibiting the continued exploration of new approaches, however, and it is doubtful whether programs will be modified enough to warrant a new evaluation (33). According to a recent Phoenix newspaper editorial, city management plans to renew the present agency's contract without soliciting proposals from other alcoholism professionals (34). It makes little sense to continue the research effort if evaluation results are not used for decision-making.

In planning new programs, it should be realized that exposure to any form of short-term rehabilitation may not be sufficient to modify DWI behavior. The societal pressures surrounding drinking and driving may not be offset by education alone, especially in the case of DWI offenders with alcohol problems. While a Workshop or Home Study experience might be sufficient to modify the behavior of "light" (easily influenced) social drinkers, really intensive treatment is probably needed for problem drinkers and alcoholics. To help these people, session length would have to be expanded many times over. This presents a challenge to the criminal justice system, since it has limited control over the DWI misdemeanor. Nevertheless, the ASAP proved to be an extremely efficient early case-finding device for problem drinkers. By getting persons into treatment in the early stages of their disease, greater likelihood existed that the progression of alcoholism could be halted.

What is needed now are more efficacious treatment modalities. Lessons learned from this research should be the Force behind public policy debate, to ensure that funds for DWI rehabilitation programs are allocated to produce maximum impact.

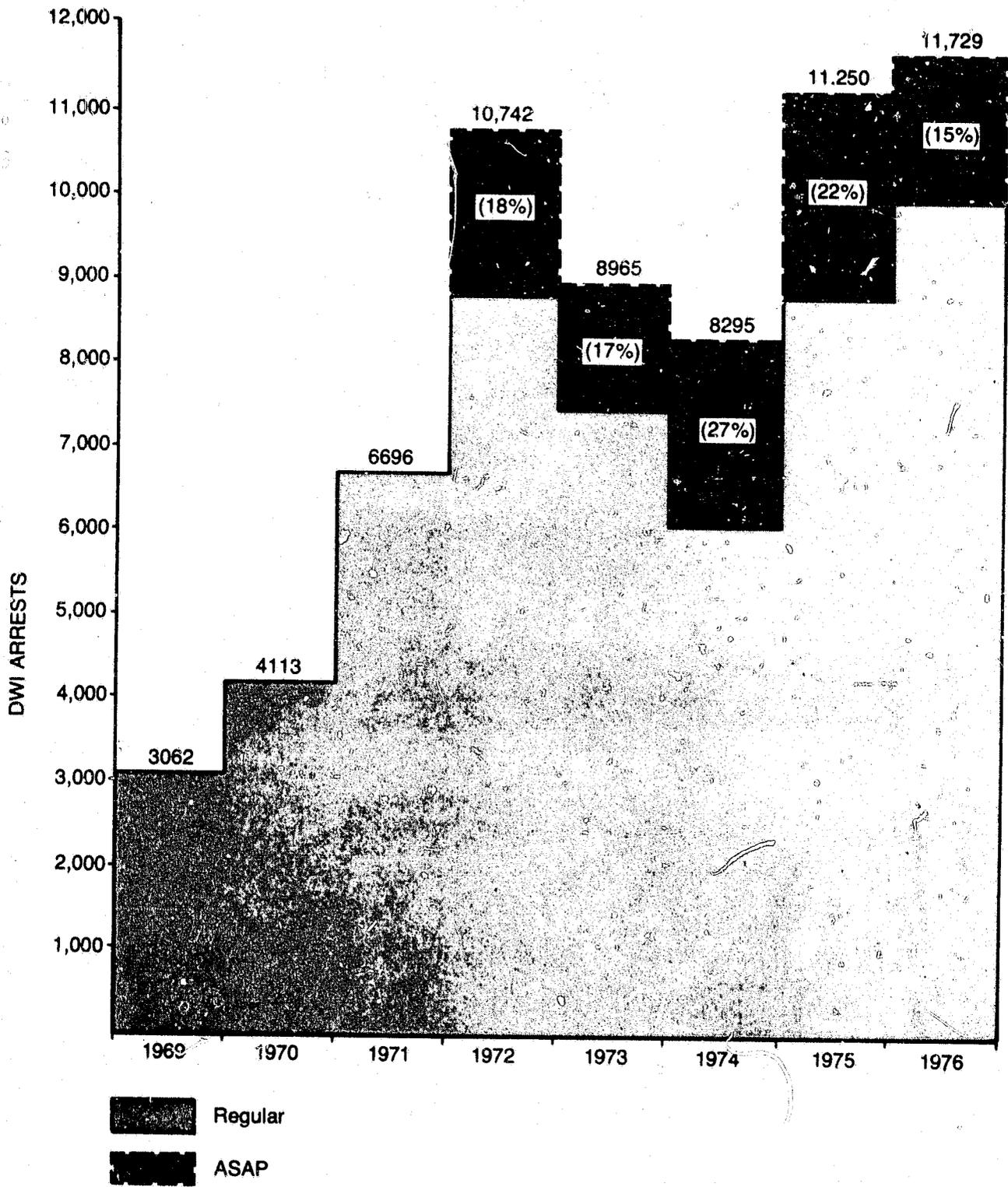


FIGURE 1  
 DWI ARRESTS MADE BY  
 REGULAR AND ASAP ENFORCEMENT GROUPS  
 1969-1976, BY YEAR

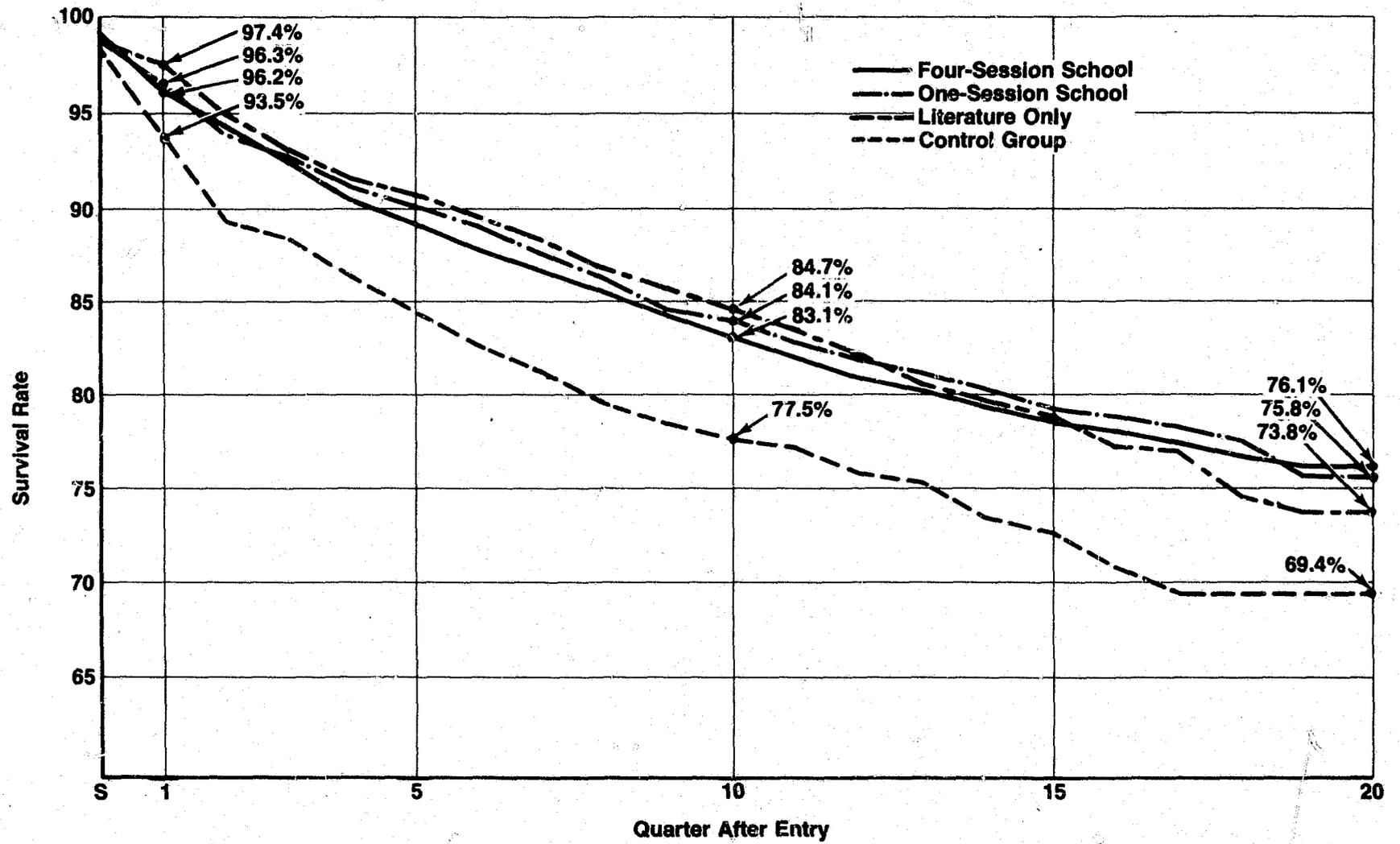


FIGURE 2  
CUMULATIVE SURVIVAL RATES FOR  
FOUR DWI SCHOOL GROUPS

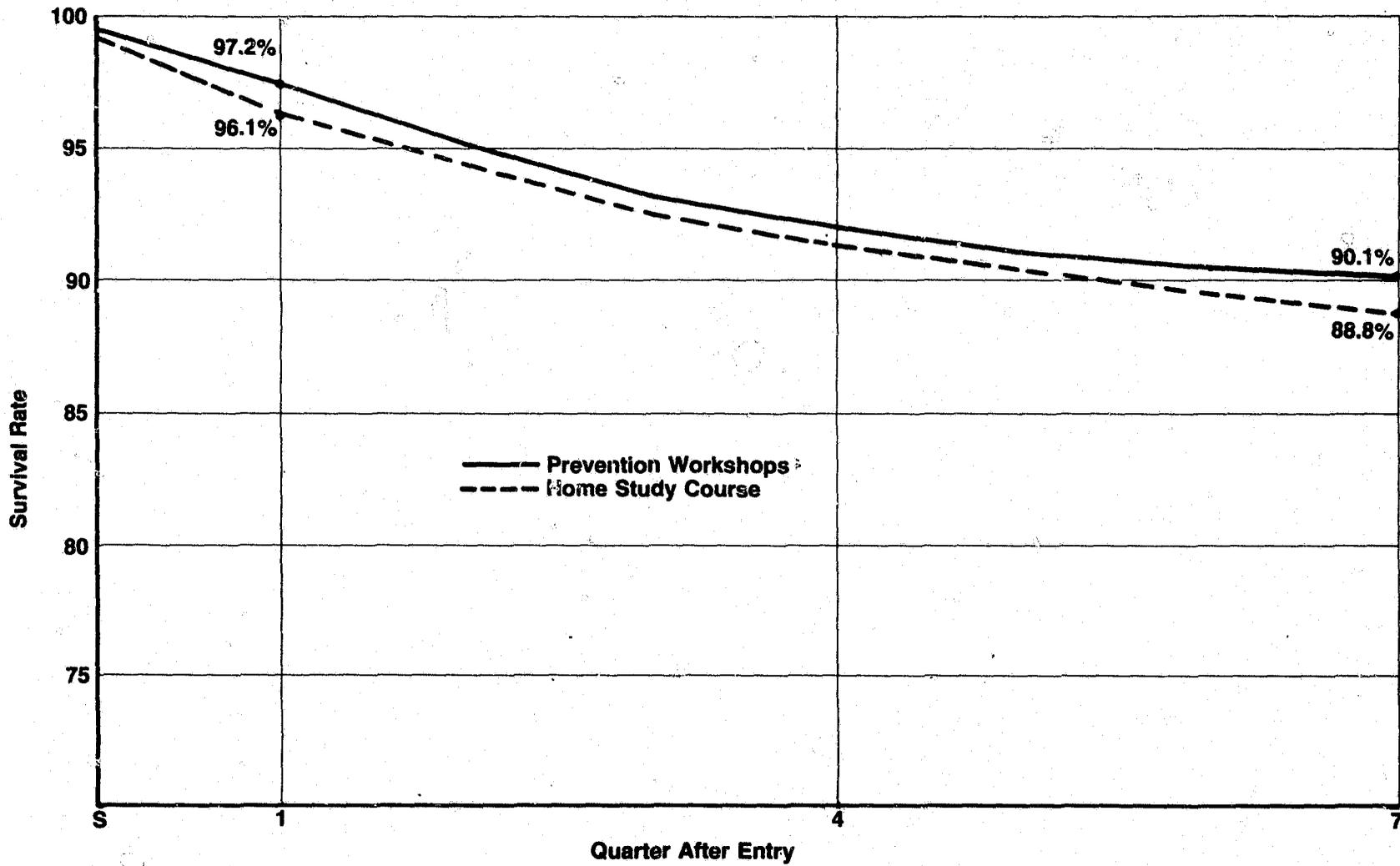


FIGURE 3  
CUMULATIVE SURVIVAL RATES FOR  
PREVENTION WORKSHOPS VS. HOME STUDY

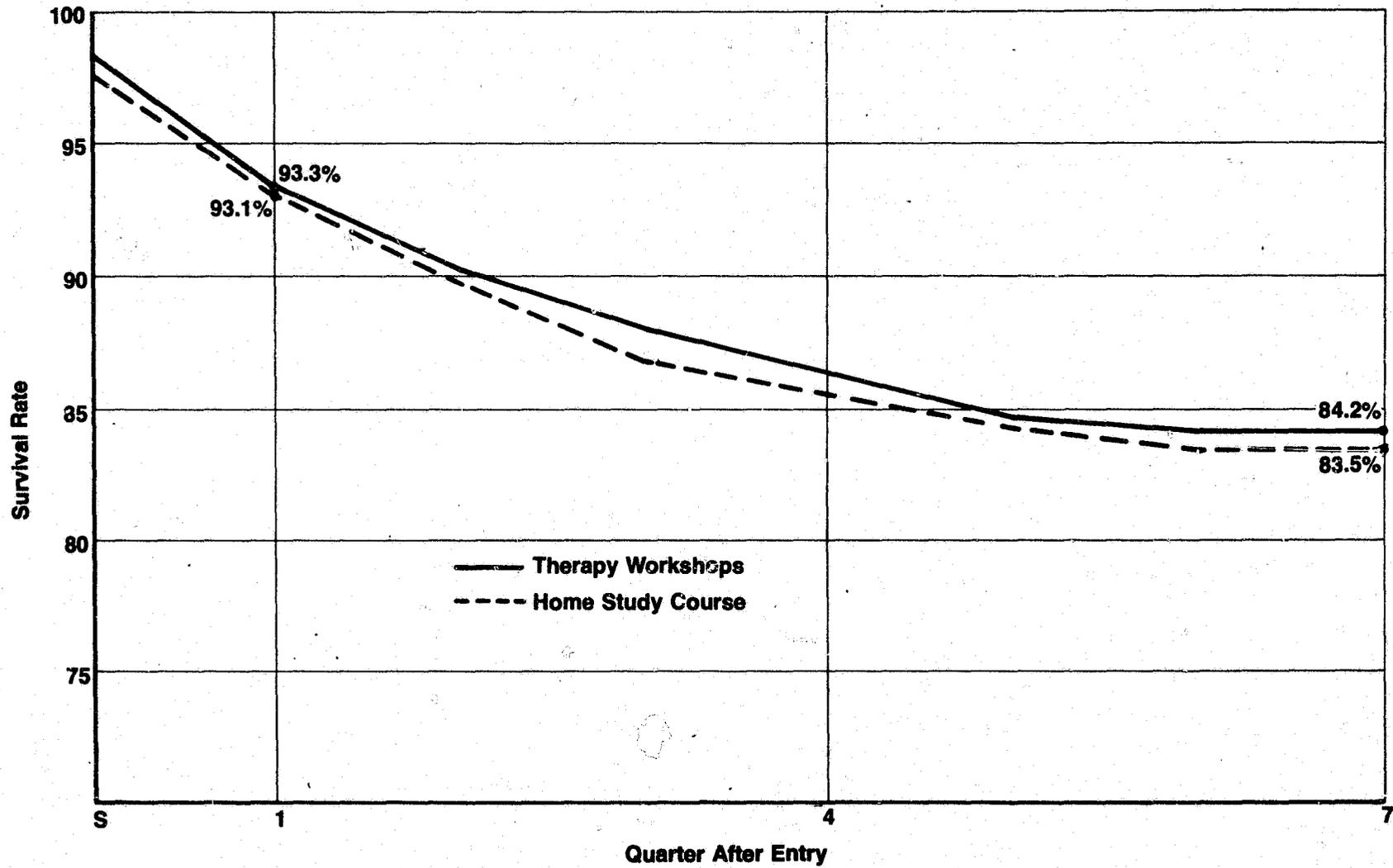


FIGURE 4  
CUMULATIVE SURVIVAL RATES FOR  
THERAPY WORKSHOPS VS. HOME STUDY

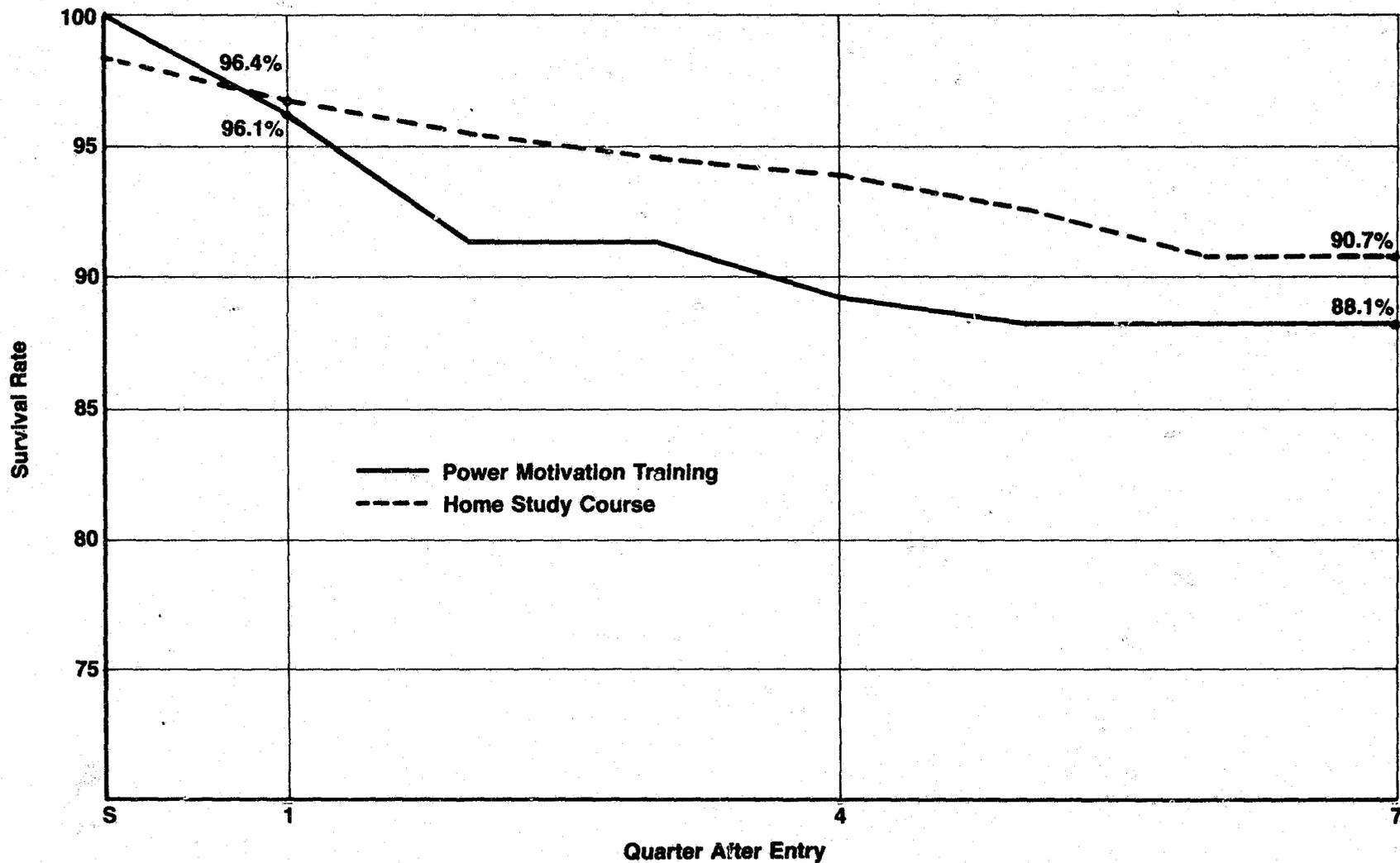


FIGURE 5  
CUMULATIVE SURVIVAL RATES FOR  
POWER MOTIVATION TRAINING VS. HOME STUDY

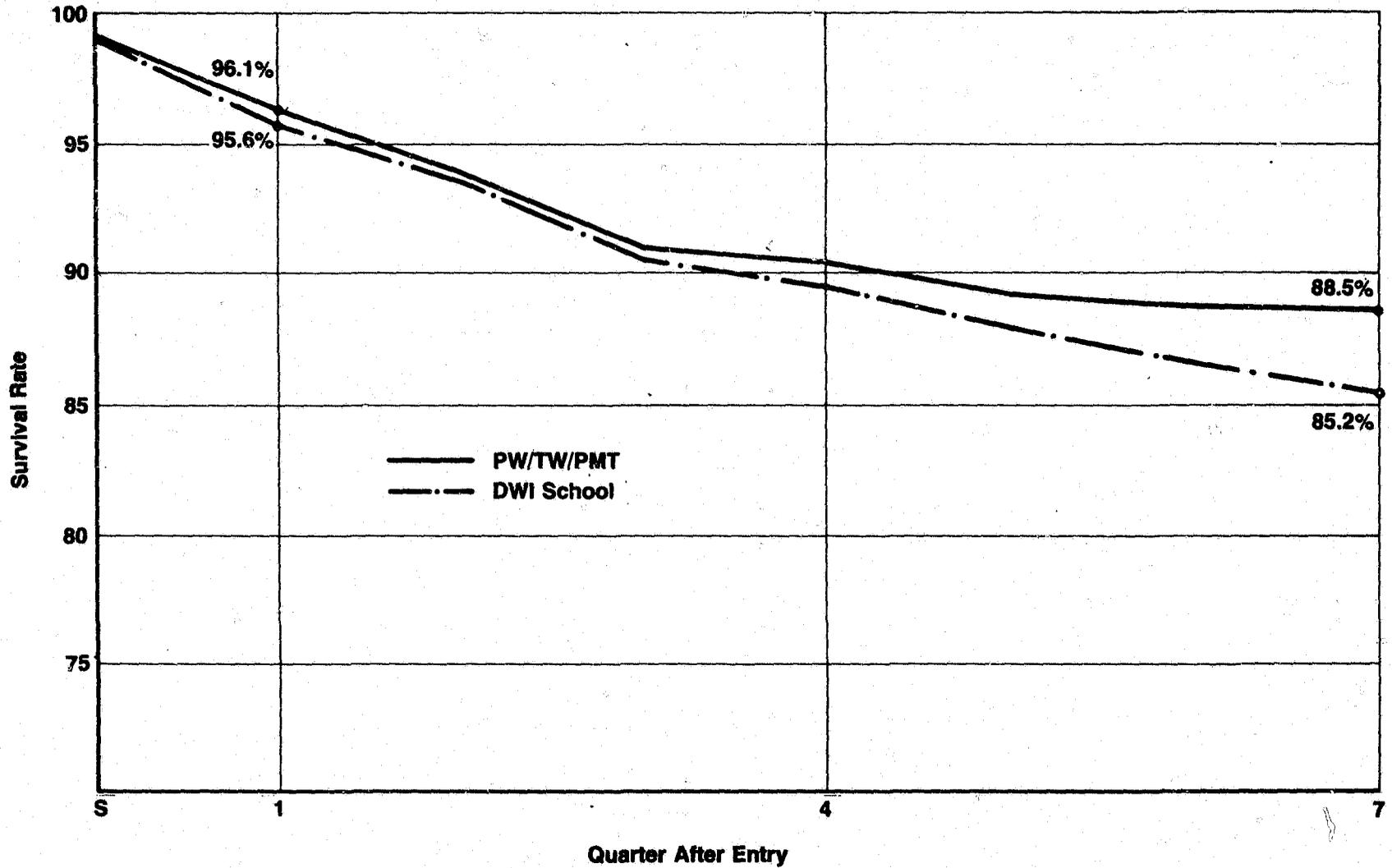


FIGURE 6  
CUMULATIVE SURVIVAL RATES FOR  
PW, TW AND PMT VS. FOUR-SESSION DWI SCHOOL

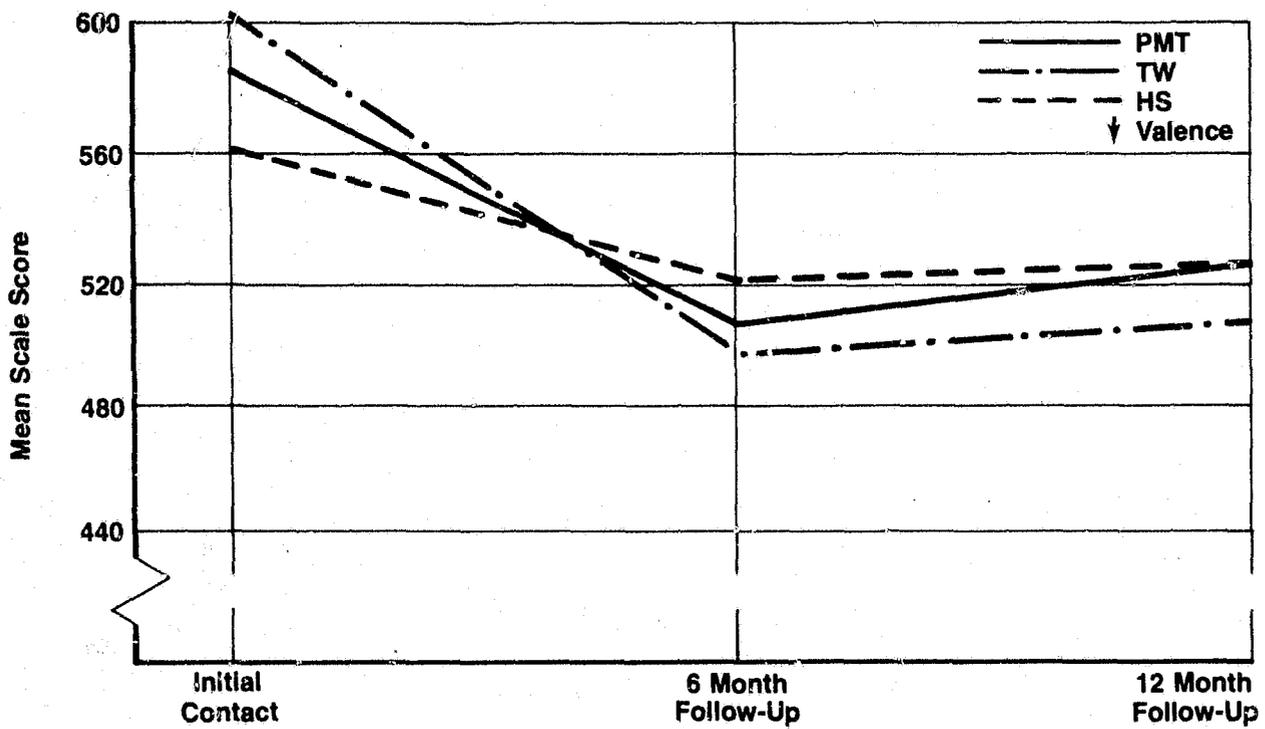


FIGURE 7  
 STR GROUP PROFILES FOR LAI SCALE VI:  
 IMMODERATE DRINKING BEHAVIOR

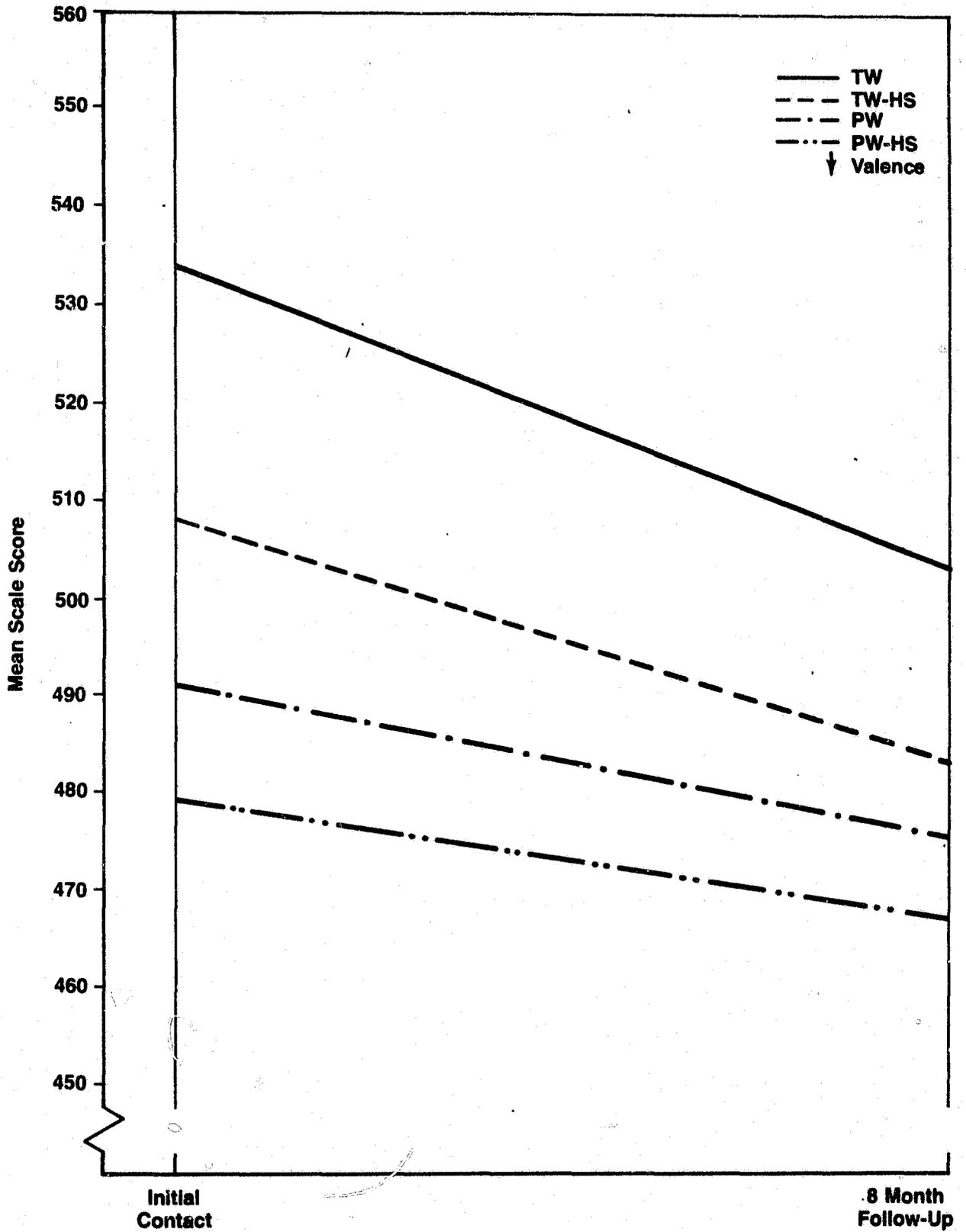


FIGURE 8  
 STRIP GROUP PROFILES FOR LAI/CSQ SCALE III:  
 CURRENT PHYSICAL HEALTH PROBLEMS

## Reference Notes

1. U. S. Department of Transportation. Alcohol and highway safety. Washington, D.C.: author, 1968.
2. Ellingstad, V. S., & Struckman-Johnson, D. L. Short Term Rehabilitation (STR) study, interim analysis of STR performance and effectiveness, 12 month analyses (DOT-HS-803-285). Prepared under Contract No. DOT-HS-6-01366, January 1978. See also Proceedings of the National Highway Traffic Safety Administration Alcohol and Traffic Safety Session, 1977 Annual Forum, sponsored by the National Council on Alcoholism. San Diego, Calif., April 29-May 4, 1977.
3. Nichols, J. L., & Reiss, R. E., Jr. One model for the evaluation of ASAP rehabilitation efforts (DOT-HS-801-244). A paper presented at the Sixth International Conference on Alcohol, Drugs and Traffic Safety. Toronto, Ontario, Canada, September 1974.
4. Ellingstad, V. S., & Springer, T. J. Program level evaluation of ASAP diagnosis, referral and rehabilitation efforts, Vol. III, Analyses of ASAP rehabilitation countermeasures effectiveness. Prepared under Contract No. DOT-HS-191-3-759-F3, June 1976.
5. Clay, T. R., & Ellingstad, V. S. Phoenix ASAP final report, section two, analytic study I: An analysis of total project impact. Phoenix, Ariz.: City of Phoenix Alcohol Safety Action Project, June 1977. (Contract No. DOT-HS-052-1-068)
6. Easterling, M. G. Phoenix ASAP final report, section one: Overall ASAP progress. Phoenix, Ariz.: City of Phoenix Alcohol Safety Action Project, June 1977 (Contract No. DOT-HS-052-1-068).
7. Scrimgeour, G. J. Has ASAP failed? Traffic Safety, February 1975, 17-36.
8. Clay, T. R., & Swenson, P. R. Phoenix ASAP final report, section two, analytic study III: An analysis of DWI enforcement activity. Phoenix, Ariz.: City of Phoenix Alcohol Safety Action Project, June 1977. (Contract No. DOT-HS-052-1-068)
9. Miles, D. D., & Clay, T. R. Phoenix ASAP final report, section two, analytic study VII: An analysis of public information and education activity. Phoenix, Ariz.: City of Phoenix Alcohol Safety Action Project, June 1977. (Contract No. DOT-HS-052-1-068)
10. Clay, T. R., & Nettleton, M. J. Phoenix ASAP final report, section two, analytic study IV: An analysis of judicial system performance. Phoenix, Ariz.: City of Phoenix Alcohol Safety Action Project, June 1977. (Contract No. DOT-HS-052-1-068)
11. Stewart, E. I., & Malfetti, J. L. Rehabilitation of the drunken driver: A corrective course in Phoenix, Arizona, for persons convicted of driving under the influence of alcohol. New York: Columbia University Teachers College Press, 1970.

12. Crabb, D., Gettys, T. R., Malfetti, J. L., & Stewart, E. I. Development and preliminary tryout of evaluation measures for the Phoenix driving-while-intoxicated reeducation program. Tempe, Ariz.: Arizona State University, 1971.
13. Malfetti, J. L., & Simon, K. J. Evaluation of a program to rehabilitate drunken drivers. Traffic Quarterly, 1974, 20(1), 49-59.
14. Malfetti, J. L. Reeducation and rehabilitation of the drunken driver. Journal of Drug Issues, Summer 1975, 255-269.
15. Swenson, P. R., & Clay, T. R. Phoenix ASAP final report, section two, analytic study VI: An analysis of drinker diagnosis, referral and rehabilitation activity. Phoenix, Ariz.: City of Phoenix Alcohol Safety Action Project, June 1977. (Contract No. DOT-HS-052-1-068)
16. Another approach to evaluation of rehabilitation effectiveness would relate treatment exposure to subsequent alcohol-related crash involvement, since this was the ultimate objective of the ASAP. Unfortunately, accident data could not be accurately related to individual clients. Even if this were possible, it is unlikely that enough observations could have been accumulated to conduct meaningful statistical tests of significance.
17. Cutler, S. J. & Ederer, F. Maximum utilization of the life table method in analyzing survival. Journal of Chronic Diseases, 1958, 8, 699-711. Data computations were carried out with the assistance of David L. Struckman-Johnson, Project consultant at the Human Factors Laboratory, University of South Dakota.
18. Phoenix ASAP Evaluation Unit, DWI prevention home study course, Phoenix, Ariz.: City of Phoenix Alcohol Safety Action Project, 1975. (Contract No. DOT-HS-052-1-068)
19. Boyatzis, R. E. Implementation of power motivation training as a rehabilitation countermeasure for DWIs; Final report (Report No. PB-253-119). Prepared under Contract No. DOT-HS-801-834, 1976.
20. Ellingstad, V. S. Program level evaluation of ASAP diagnosis, referral and rehabilitation efforts: Volume IV - Development of the short term rehabilitation (STR) study (DOT-HS-191-3-759-F4). Vermillion, S. Dak.: University of South Dakota, Human Factors Laboratory, September 1976. (NTIS No. DOT-HS-802 045)
21. Foster, F. M., Horn, J. L., & Wanberg, K. W. Dimensions of treatment outcome: A factor-analytic study of alcoholics' responses to a follow-up questionnaire. Quarterly Journal of Studies on Alcohol, 1972, 33, 1079-1098.
22. Horn, J. L., Wanberg, K. W., & Adams, G. Diagnosis of alcoholism: Factors of drinking, background and current conditions in alcoholics. Quarterly Journal of Studies on Alcohol, 1974, 35, 147-175.
23. Armor, D. J., Polich, J. M., & Stambul, H. B. Alcoholism and treatment (Report No. R-1739-NIAAA). Santa Monica, Calif.: The Rand Corporation, June 1976.

24. Ellingstad, V. S., & Struckman-Johnson, D. L. Interim analysis of STR performance and effectiveness (HFL-77-3). Vermillion, S. Dak: University of South Dakota, Human Factors Laboratory, June 1977. (NTIS No. DOT-HS-802 569). Appreciation is extended to Dr. Ellingstad, Project consultant, for his technical assistance in both the STR and STRIP studies.
25. Vannicelli, M., Pfau, B., & Ryback, R. S. Data attrition in follow-up studies of alcoholics. Journal of Studies on Alcohol, 1976, 37, 1325-1330.
26. Campbell, D. T., & Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally, 1963.
27. McGuire, J. P., & Peck, R. C. Traffic offense sentencing processes and highway safety, Vol. 2, Technical Report. Prepared under Contract No. DOT-HS-4-00970, April 1977.
28. Ross, H. L. The Scandinavian myth: The effectiveness of drinking-and-driving legislation in Sweden and Norway. Journal of Legal Studies, 1975, 4, 285-310.
29. Rose, H. L. Britain's drinking-driving experience. Traffic Safety, July 1974, 8-36.
30. Whitehead, P. C. DWI programs: Doing what's in or dodging what's indicated? Journal of Safety Research, 1975, 7(3) 127-134.
31. Ennis, P. K. General deterrence and police enforcement: Effective counter-measures against drinking and driving? Journal of Safety Research, 1977, 9 (1), 15-25.
32. Preusser, D. F., Ulmer, R. G., & Adams, J. R. Driver record evaluation of a drinking driver rehabilitation program. Journal of Safety Research, 1976, 8(3), 98-105.
33. A growing body of literature has confronted the political context of evaluation research. See for example: Weiss, C. H. Where politics and evaluation research meet. Evaluation, 1(3), 1973, 37-45. Also see Freeman, H. E. The present status of evaluation research. In M. Guttentag & S. Saar (Eds.), Evaluation studies review annual (Vol. 2). Beverly Hills, Calif.: SAGE, 1977.
34. New ideas needed. The Arizona Republic, April 23, 1978, p. 6.