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ATTACHMENT

Testing Cohen's Routine Activity Theory: An Analytic Scheme

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INTRODUCTION

The routine activity theory, as set forth by Lawrence E. Cohen, Marcus Felson, and their colleagues, posits a causal relationship between changes in ecological structures and fluctuations in national crime trends since the end of World War II. Cohen, et al. argue that this perspective satisfactorily explains temporal changes in crime rates that confound other theories. Relying on official sources of reported crime, Cohen and Felson (1979) maintain that the predictions of many sociological theories were not realized during the 1960s, when crime rose throughout much of the decade despite widespread economic prosperity. On the other hand, the increase in crime rates slowed during the 1970s while the country experienced economic recessions and rising unemployment.

The routine activity perspective has its conceptual roots in social ecology. Cohen and his associates specifically base the theory on the ecological conception of a human community as an organization of various relations among inhabitants (including groups of inhabitants) of the community. These relations are defined and become evident by patterns of activity performed in space and overtime. The authors of routine activity theory extend this notion of interdependent human interactions to criminology by reasoning that illegal activities performed by certain members of the population depend upon patterns of legal activities exhibited by others in the community. In other words, the variations and characteristics of legitimate routines result in situational exigencies that may inhibit or facilitate the likelihood that

certain crimes will occur. The temporal and spatial organization of routine, legal activities therefore influences the location, frequency, and distribution of crimes.

The main thesis of the routine activity approach is that variations in the daily activities (e.g., work and leisure behavior) of individuals increase or decrease the likelihood that conditions necessary for the occurance of a victimization will converge in time and space. The three conditions that must be met for a victimization to occur, according to Cohen and Cantor (1980), are the presence of motivated offender(s), the availability of suitable target(s), and the absence of capable guardians for the target(s). Mere convergence of these factors does not, of course, guarantee that a crime will take place. Rather, victimization is conceptualized as a stochastic process dependent on the spatial and temporal organization of human behavior that permits interaction of the three minimal conditions.

Considerable evidence supports the proposition that situational opportunities encountered by offenders underlie a large percentage of crimes. Within this context, routine activity theory hypothesizes that five mediating variables account for the bivariate associations frequently found in studies of the relationship between crime and demographic characteristics. These mediating factors, which are actually risk factors that affect the likelihood of victimization, are exposure, guardianship, proximity to potential offenders, target attractiveness, and definitional properties of the crime. By taking criminal motivation as a given, the framework focuses on the interplay of these risk factors and considers how trends and changes in social conditions affect the

convergence of a victimization event's minimal components. It is therefore possible to construct an explanation of temporal trends in victimization rates.

The formulation of this theory has prompted several research efforts to test and evaluate it hypotheses. Although previous studies have largely supported routine activity theory, important issues regarding the perspective's efficacy remain unaddressed due to the foci of these studies. These assessments of the routine activity framework can be grouped according to methodological emphasis. One group of research employs highly aggregated temporal measures of changes in social structure and social production patterns to account for long-term (1947-1974) fluctuations in Uniform Crime Report (UCR) figures for certain crimes. The second group of studies analyzes data from the National Crime Survey in cross-sectional tests of particular hypotheses. Despite the soundness of both groups of studies, and the support their results lend to the theory's propositions, these studies do not adequately test certain aspects of theory.

Much of the theoretical development and empirical assessment of routine activity theory concentrates largely on a macro-structural level. Cohen and Felson (1979), in a seminal article, explain clearly that their interests lie in the examination of how the structural aspects of social organization which influence occurrences of crime fit into the overall organization of a human community. The assumption which underlies this theoretical approach is that aspects of the ways in which members of a human population organize and interact to achieve legitimate social ends influence (positively and negatively) the opportunities for

certain crimes to occur within that population. The result is that longitudinal tests of the theory have not specifically addressed the household or individual level manifestations of the causal relations set forth in the theory. This research is designed to fill that void.

Chapter 1 contrasts in general the structural emphasis of opportunity frameworks with the motivational focus of other sociological theories that concentrate on offender characteristics and dispositions toward crime. It is shown that these two broad theoretical guides approach the study of crime from radically different starting points. Opportunity theories assume that individual motivation toward crime is constant and focus on how the environmental context in which crime takes place affects opportunities for crime. On the other hand, theories that concentrate on offender behavior seek explanations for the likelihood that individuals will be disposed toward committing a crime.

Chapter 2 discusses the ecological foundation for routine activity theory and outlines the theory. Following a critical review of research that tests the framework, the chapter closes with a general description of the existing shortcomings addressed by current work. Three conceptual features of the theory--its crime-specific nature, the individual level focus of its main thesis, and the causal nature of its hypotheses--are identified as deserving special attention in the discussion of specific design issues.

Chapter 3 expands upon material raised in the previous chapter and discusses directly the implications of the perspective's crime-specific focus for the design and conduct of this research. The practical and theoretical considerations that influenced the decision to

limit this inquiry to residential burglary are discussed, and research that investigates patterns and correlations of burglary is reviewed. This examination suggests a need to direct specific attention toward the causal dynamics of the burglary incident. This is precisely the focus of this project. In addition, the chapter introduces the question of reciprocal causation in connection with routine activity theory. Within this context, reciprocal causation refers to a phenomenon where changes in lifestyle are presumed to be affected causally by victimization, as well as the opposite. Sufficient evidence exists, it is argued, to suggest probative value in exploring the effects that the introduction of feedback hypotheses have on the analysis of a routine activity model of residential burglary.

The final chapter discusses the panel design of the dataset employed in this research and explains the analytic strategy, including methods to be used and variables available for analysis. Special attention is given to the problem of censored data (loss of information on units in the sample) often associated with panel designs. Specific remedies for eliminating or minimizing detrimental design effects are proposed. The chapter concludes by summarizing the overall importance of the direction taken in this research.

CHAPTER 1

Conventional wisdom among scholars, policymakers, and the public holds that crime has risen at an unprecedented rate during the last two decades. This presumed rise in crime prompted considerable political and academic discussion resulting in a variety of programs, research efforts, and theoretical explanations. The National Commission on the Causes and Prevention of Violence (1970) alludes to the puzzling configuration the data exhibit when it asks rhetorically, "Why...have urban violent crimes increased substantially during the past decade when the conditions that are supposed to cause violent crime have not worsened---have, indeed generally improved?" (p.33). While carefully noting counter-trends and gaps that persist between minority subgroups and the larger society, the Commission goes on to state:

> The Bureau of the Census...states that most indicators of well-being point toward progress in the cities since 1960.' ...[T]he proportion of blacks in cities who completed high school rose from 43 percent in 1960 to 61 percent in 1968; unemployment rates dropped significantly between 1960 and 1968; the median income of families in cities rose by 16 percent between 1959 and 1967...and the median family income of blacks in cities increased from 61 percent to 68 percent of the median white family income during the same period. Also during the same period the number of persons living below the legally-defined poverty level in cities declined from 11.3 million to 8.3 million.' (p.33)

As UCR statistics illustrate, the paradoxical circumstances cited in the violence commission's Final Report are not limited to violent crime. Property crimes, which account for the vast majority of

offenses, increased at a similar rate to that for violent crimes despite economic expansion and falling unemployment. Aggregately, violent crime rose 104.9 percent during the 1960s while property crime grew by 94.1 percent. The annual rate fluctuations for each UCR index category show clearly that they rose moderately during the first five years of the '60s with a much larger incr ase recorded in the following five year period (UCR, 1982). These increases occurred despite general economic expansion and a steadily declining unemployment rate. Many authors consider it puzzling indeed that one component in the quality of life (crime) rises, thereby detracting from life's desirability while most other ingredients in a quality of life index (e.g., real income, poverty, unemployment) that supposedly influence crime signal overall improvement.

Although dramatic increases in the crime rate have been documented consistently by UCRs, it has been widely argued that UCRs do not reflect patterns of real crime but, rather, the organizational processes and structures of the reporting agencies (Kitsuse and Cicourel, 1963; Wolfgang, 1963; Robinson, 1966). By this time, the long list of objections and problematic issues associated with the UCRs is well known making detailed discussion unnecessary; the list includes, among other issues, agency bias, variation in reporting practices, patterns of non-reporting, imprecise and broad crime categories, crude rate computations, definitional variation, and inadequate offense information (see Hindelang, 1974 for a complete review).

There is additional research that suggests the longitudinal trends exhibited by UCR figures may be proportional to real crime trends

in spite of the many difficulties associated with UCR. Studies reveal consistently that seriousness of offense is the best predictor of whether a crime will be reported to the police (Hindelang, 1976; Nettler, 1978). It seems reasonable then that some portion of the upward trend in UCR index crimes is the result of an increased volume in these crimes. Changes in organizational processes and reporting practices of law enforcement agencies are sometimes cited as the cause for the large increases in crime (Black, 1970; Maltz, 1977). Although changes in departmental policies probably contribute to changes in rates of reported crime, it seems doubtful that this is a major factor in the longitudinal character of UCRs. Although McCleary, Nienstedt, and Erven, (1982) demonstrate that official estimates of crime are functions of organizational structures and practices, these authors emphasize that their time series analysis of crime rates does not suggest that longitudinal trends in those figures are inaccurate. They conclude to the contrary that, in the absence of additional evidence, confidence in UCR trends is warranted.

Social theory of the period could not satisfactorily explain the magnitude of crime increases experienced in the 1960s, and explaining this phenomenon became a high priority on the social research agenda. Investigations of these crime trends focus on a variety of social, political and economic variables resulting in an explosion in the professional literature. A complete review of this research is unnecessarily lengthy but a brief discussion will be helpful. The early studies in this genre of research analyzed bivariate relationships between UCRs and a variety of demographic variables (see, for example,

Sagi and Wellford, 1968; Ferdinand, 1970; Wellford, 1973). Perhaps the best known of these studies, The Task Force Report of the President's Commission on Law Enforcement and the Administration of Justice (1967), attributes half of the 1960-65 UCR increase to changes in age, sex, race and other factors associated with urbanization. The Commission also attributes a large part of the UCR rate to unemployment. This finding was based on a simple bivariate relationship, however: young black males who suffer disproportionately high rates of unemployment and are also disproportionately represented in the offender population. Correlation does not necessarily convey causality, of course, so this and other major findings in the Report are suspect.

Most of the early research suffers from this same methodological flaw, which might account for the consistent findings of the literature. The early studies had a strong influence on theory and policy nevertheless. Criminologists in the late '60s and '70s concentrated on dispositional or motivational constructs and crime prevention programs of this period stressed offender motivation and rehabilitation (Clarke, 1980; Lewis and Salem, 1981). The predictions of the early research were not borne out, however. When the economy approached and surpassed full employment in the '60s, for example, crime rates did not drop; they rose. Similarly, when the baby boom generation matured in the '70s, crime rates continued to rise, albeit more slowly.

These types of considerations prompted some scholars to express dissatisfaction with traditional theoretical frameworks that guide the scientific study of crime. Gould (1969), for example, argues that criminological research stagnated and urges researchers to move away from

their reliance on offender motivation in their search for explanations of crime. Instead, he advocates that structural and situational factors affecting criminal opportunities be explored. A synopsis of the theoretical outlook that concentrates on individual dispositions toward criminality follows which will clarify the distinction between motivational and structural approaches.

Theoretical perspectives dominant in the early 1960s posited a motivational construct emanating from dysfunctional social conditions that lead to deviance. This is evident in Merton's (1938) general theory that norm violations result from the poor integration of cultural values and structural opportunities. In other words, the means available for people to pursue socially induced goals of economic success and self-fulfillment are not available equally to all segments of society. The result of this ends-means discrepancy is stress that in turn prompts individual deviance in an effort to alleviate the tension.

Other scholars, focussing primarily on Merton's lack of specificity regarding particular deviant adaptations, sought to expand this general strain framework. Cloward and Ohlin (1964) apply the theory to specific delinquent reactions of theft, drug use, and aggression. Although they adopt the hypothesis that strain and its presumed frustration provide the motivational impetus for crime, more was necessary; motivation alone, they argue, is insufficient to explain criminality. Successful adaptation through delinquency also requires the opportunity to learn and use the illegitimate means employed in a reduction of stress. They therefore present a mixed model that combines

elements of cultural deviance theory within a strain framework and argues for a subculturally supported delinquent response when legitimate opportunities are blocked and the opportunity exists (through the subculture) for exposure to illegitimate means and criminal role models.

In contrast, Albert Cohen (1955) expands the basic strain formulations in a slightly different direction due, in part, to his skepticism of the emphasis strain theorists place on the social class of delinquents. If initial tendencies toward delinquent activity originate with juveniles' discontent and frustration about their lower class positions in society, then middle class delinquency and norm violations among the upper classes are not explained. Cohen continues by arguing that perceived status discontent, not dissatisfaction with class position, provides a motivational impetus for delinquent reactions to strain. The youth is unable to achieve success by reaching socially valued goals and the enhanced status it conveys and so adopts the values held within a delinquent subculture in order to achieve the desired status. Although dominant norms are repressed they are not eradicated; consequently, violations of these norms result in anxiety that is countered by a defense mechanism Cohen refers to as reaction formation. This response is characterized by an exaggerated repudiation of the norms so that the delinquent is persuaded to hate what is actually desired. Reaction formation, therefore, accounts for the non-utilitarian, hedonistic nature of subcultural delinquency that Cohen felt traditional strain theory left unexplained.

If it is true that science requires theory to challenge the data, then the motivational perspective falls short. The general crime

trends and indicators of social well-being already discussed are, to some extent, problematic for such a theoretical framework. Furthermore, evidence from research in tangential areas of interest suggesting cultural value consensus and disconfirming the pressure of discrepant goal and aspiration orientations (e.g., Gold, 1963) undermines the presumed efficacy of a motivational foundation in the study of delinquency. Gibbons (1971) took note of such evidence and the relative stagnation under which etiological research in criminology labored, calling for new ways to look at criminality. New ground needed to be broken for new and more promising hypotheses to emerge. Some scholars (e.g., Ferdinand, 1966; Clinard and Quinney, 1967) explore the heuristic value of typologies while others (e.g., Briar and Piliavin, 1965; Liebow, 1967; Gould, 1969) investigate situational or structural factors that may induce or inhibit crime.

Although crime rose during the 1970s, the rate of increase slowed; this occurred despite the onset of economic recession and rising unemployment. The rate of reported violent crimes rose by 32.5 percent between 1970 and 1975 (compared to an 81.6 percent increase from 1965 to 1970) and by 20.6 percent during the 1975-1980 period. In comparable time periods, property crime climbed by 32.6 percent (1970-1975) and 10.8 percent (1975-1980). This same pattern of declining rates of increase in the 1970s characterizes all index crimes. Reacting to methodological shortcomings of earlier work, researchers moved away from motivational-dispositional theories toward ecological theories, especially theories relating to criminal opportunity and victim activity. Rather than focus on offenders' dispositions, opportunity

perspectives assume that criminal motivation is constant and concentrate instead on situational factors which contribute to the likelihood of victimization. Bittner and Messinger (1980) comment that this area of theoretical development received an important impetus with the introduction of lifestyle variables by Hindelang and his colleagues in their analyses of victimization patterns. Routine activity theory emerges from this school of thought and represents a major theoretical advance. Several authors note the complementary nature of the motivational and structural perspectives, and suggest that combining features from each may lead to more powerful explanations of crime. Two works (Land and Cohen, 1983; Sampson, 1983) specifically argue for a synthesis of routine activity theory and other sociological frameworks in the explanation of crime rates. However, these efforts toward integration may be premature in the case of routine activity theory because crucial elements of the perspective remain untested. This research project will explore some of the important gaps in the theoretical development of routine activity and provide necessary tests.

CHAPTER 2

A Routine Activity Theory of Crime: Ecological Basis and Conceptual Outline

Ecology as a Research Framework

Ecology is traditionally defined as a type of research method that encompasses principles and assumptions which govern the study of organisms within a specified environment. Ecologists focus on the spatial and temporal interrelationships between organisms (including groups of organisms) and the environment that comprises an ecosystem or subsystem of particular interest. Emery and Trist (1973) point out that an ecologist has a characteristic viewpoint regardless of the discipline or subject under study. The common thread is the belief that a pattern of life in a defined habitat constitutes one system of interdependencies. When one group in a population changes in some way, ecology assumes that the structural regularities which make the pattern recognizable are a result of the mutual influences each group exerts, directly or indirectly, on all other groups as well as the effects of all groups on their shared environment. Viewed in this manner, a habitat's life patterns constitute a net of multiple, reciprocal influences which operate constantly.

The structure of this net of interrelations, the focus of attention for ecologists, is manifested in the cycles, rhythms, and tempo that characterize spatial and temporal developments in a habitat (Hawley, 1950). Social ecologists concentrate on the study of interrelations

between a human population and its environment. Ecological studies in the social sciences typically focus attention on the network of relations in the human community by directing attention to the distribution (e.g., geographic) of human populations, human group characteristics (e.g., demographics, voting behavior) and their interactions, and the products (e.g., social, political, economic organizations) generated by those populations (Gibbs and Martin, 1959).

This approach has been applied to the study of crime by many researchers. In fact, ecological studies of crime can be traced to the relatively early days of European criminology as represented by the works of Quetelet (1843) and Pike (1876). Ecology has been used widely by American criminologists as well to study many aspects of crime and delinquency (e.g., Shaw, McKay, Zorbaugh, and Cottrell, 1929; Boggs, 1965; Turner, 1969; Riess, 1976). The modern ecological crime literature is vast and diverse, ranging from Harries' (1974) geographic description of crime's distribution to Fox's (1982) application of sophisticated predictive forecasting methods.[1]

Although there is considerable agreement among scholars about the importance and potential value of an ecological approach in criminology (Schuessler, 1962; Bittner and Messinger, 1980), serious questions exist regarding limitations associated with ecological inquiries. Hirschi (1969) explicitly doubts the wisdom of basing criminological theory on ecological data and Wilks (1967) discusses in detail some of the methodological difficulties and inferential limitations often associated with ecological studies of crime.

Many of the inferential difficulties usually discussed in connection with ecological studies in the social sciences result from aggregation bias. Analytic dangers associated with the ecological fallacy are well documented since Robinson's (1950) demonstration that it is inappropriate to draw inferences about individual behavior from group level data. Relationships observed at the group level do not necessarily hold for the individuals in the group; the direction and magnitude of an association between variables can change significantly as one moves between levels. Of course, it is equally hazardous for a researcher to infer group characteristics solely from the compilation of individual data. Most social phenomena of interest to researchers are multi-level in nature, however. Group properties have manifestations at the individual level and affect those who populate the group just as individual attributes contribute to the texture and character of the group. For this reason, specific attention must be given to the complexities presented by the multi-level character of the subject under scrutiny.

In the case of routine activities, and their relation to crime, cross-level implications seem clear and straightforward. Daily routines are synonymous with styles of life.[2] Since patterns of activity are largely structured by work and leisure, and people with similar lifestyles tend to cluster, it is possible to characterize aspects of lifestyle aggregately. Researchers often employ measures or social indicators which reflect a group's character. For example, Cohen, Felson, and Land (1981) form an aggregate index that partially measure

household exposure to the opportunity for household property crimes with the following ratio computed from U.S. Labor Department statistics:

$$\frac{\text{no. of working women with husbands + no. of non-husband/wife households}}{\text{Total Households}}$$

As a macro-level social indicator (Cohen, et al. refer to this as a household activity ratio), however, this ratio does not necessarily reflect the variability of the individual households that comprise the group. By household exposure the authors refer to the household's state of unguardedness, yet such a measure is insensitive to household-level manifestations of this activity ratio. One illustration is provided by households where the husband and wife both work outside the home, yet the household might contain other occupants (e.g., older offspring, extended family members) who are home during working hours and are capable guardians for the property. Moreover, patterns of change in work or leisure routines within households (and, therefore, changes in exposure) can not be detected by such a measure. The household-level form and variation exhibited by this particular component of lifestyle may not be the same as that observed at the group level. Furthermore, relationships that are observed at the group level (e.g., the association between household activity and the likelihood of certain victimizations) could take on a different complexion when analyzed at the household level.

The consequences of this multi-level character for social research are troublesome if the investigator seeks cross-level generalizations. If a researcher's data and analytic strategy

concentrate only on one level, then conclusions are, for the most part, limited to that level. Nettler (1978) notes that most ecological studies in criminology are interested in generalizing about individuals, but rely on aggregate data because relevant information on individuals is often unavailable or prohibitively expensive to collect. It is not that Cohen and his associates are unconcerned about the role of individuals; several of their hypotheses are stated in terms of individuals and their households (see Cohen and Felson, 1979; Cohen and Cantor, 1980; Cohen & Felson, 1981). But their many measures do not explore the household-level ramifications of the longitudinal relations they posit.

There are, of course, ways of overcoming the analytic and inferential constraints associated with ecological studies. Langbein and Lichtman (1978) present some solutions that rely on computational methods and the manipulation of procedures used to group the data. These are designed specifically for use when only aggregate data are available, but generalization to the individual level is desired. Alternatively, many social ecologists point to the value of combining survey data with ecological traits as a fruitful way for generating cross-level understanding of social phenomena (Allardt, 1969; Scheuch, 1969; Moore and Golledge, 1976). This not only provides individual-level assessments of observed macro-level relations, but broadens the theory's informative value. According to Allardt (1969), the notion of informative value pertains to the empirical content of scientific statements. By combining survey and aggregate data, researchers increase the empirical content of hypotheses because the new level of data increases the number of ways a theoretical statement can be falsified. This implies, of course, a more

rigorous, scientific test. But the greater the variety of events that a theory explains, the higher its informative value. The ability to draw conclusions across levels of aggregation, in turn, broadens the scope of possible generalizations.

Most of the research completed thus far that tests routine activity theory relies heavily on analyses of aggregated data (Cohen and Felson, 1979; Cohen, Felson, and Land, 1980). Little work has been done that examines the household-level implications of propositions set forth by routine activity theory. Cohen and Cantor's (1981) study of burglary employs data from the National Crime Survey, and Sampson (1983) uses the NCS to draw conclusions relevant to the theory from his investigation of structural density and crime. Neither of these studies nor other research explores the longitudinal character of household level relationships as displayed by individual members of the home. This research will fill that need by concentrating on a longitudinal assessment of routine activity theory at the household level using data from the National Crime Panel. Before moving forward with the details of this project, however, it is necessary to consider the broad conceptual framework outlined by the theory. The discussion begins with an explanation of the general ecological basis for the perspective, proceeds to outline the theory's basic structure, and concludes with a review of previous research that tests the theory.

The Ecological Community

Cohen derives his perspective, in part, from Hawley's (1950) Human Ecology: A Theory of Community Structure. In this work, Hawley uses spatial and temporal aspects of human organization to explain

interactions between people and environments. Drawing on ecological biology, Hawley describes the human community as an organization of symbiotic and commensalistic relations defined by the patterns of activities performed in space and over time. These spatial and temporal patterns represent structures which are manifestations of interactive relationships that operate within the human community. This is quite similar to the web of life construct employed by Charles Darwin in his work on evolution. This (web of life) concept is, of course, identical to the idea presented earlier about a network of relationships. All life, Hawley explains, is inevitably dependent upon other surrounding life. The result is an interdependent habitat constituting a set of stimuli to which organisms respond and adapt. As the community's division of labor evolves, the argument continues, patterns of interdependence and adaptation will change. Early ecological studies of crime (e.g., Shaw et al., 1929) and geographic studies (e.g., Harries, 1974) concentrate on spatial dimensions, ignoring temporal considerations. Routine activity theory is explicitly longitudinal, however. The assumed interdependence of diverse community activities is related specifically to criminology within this perspective, and is used as a theoretical foundation for explaining the temporal fluctuations in post-World War II crime rates.

A point of clarification is appropriate before continuing further. While human activity within an ecological perspective is related to and dependent upon the structural milieu, strict determinism is neither intended nor implied. Factors linked to habitat are by no means the sole determinants of behavior. Rather, structural

characteristics exert an influence on human actions that ranges from permissive to restrictive. Within criminology, concentration on ecological structures that either facilitate or inhibit the occurrence of crime overcomes, in part, a limitation inherent in theories that focus only on personal attributes of offenders (Schuessler, 1962). Offenders' characteristics (e.g., demographics) are usually associated with the disposition or propensity to commit some criminal offense and can not address directly the aspects of social organization which affect opportunities for certain crimes independent of criminal inclinations. Explanations of crime are thereby broadened and enriched when opportunity-related variables are brought to bear.

The Ecology of Routine Activities and Criminal Opportunities

As noted earlier, ecological theories are not new to criminology; indeed the roots of ecological approaches to the study of crime date to the early nineteenth century. However, the particular conceptualizations contained in Cohen's opportunity perspective are new in two ways. One, mentioned in the previous section, is the reliance on temporal as well as spatial variations within a human community context. The second is treatment of routine activities as ecological structures. Cohen and Felson (1979) extend the interdependent character of community life to occurrences of crime by reasoning that illegal activities must depend on legal activities; spatial and temporal structures of routine activities should, therefore, influence the location, frequency and distribution of illegal acts.

The main thesis of routine activity theory is that variations in the daily activities of individuals increase or decrease the probability

of convergence in time and space of three components which are minimally necessary for a victimization to occur: (1) motivated offender(s), (2) suitable target(s), and (3) the absence of capable guardian(s) for those targets (Cohen and Cantor, 1980). Although these three conditions are necessary for a victimization, they are not sufficient; convergence does not guarantee a victimization. The mere presence of an opportunity for crime does not mean that other factors can not influence the outcome. Whether a motivated offender acts upon an available opportunity might depend, for example, upon the subjective perception of that offender. As Clarke (1984) explains, even a motivated offender might not act upon an opportunity if he fails to recognize it subjectively as such for some reason. Victimization is viewed within an opportunity perspective as a stochastic process dependent on the spatial and temporal allocation of human activities. The spatial and temporal distributions of human behavior combine to either permit or impede the interaction of those components necessary for a crime to occur.

Data are available which illustrate concretely how changes in the pattern of particular, legitimate routine activities influence opportunities for certain criminal victimizations. Surveys that explore how people use their time show a consistent pattern of change in the allocation of routine activities from home to non-home settings since World War II (deGrazia, 1962; Szalai, 1973; Kuic, 1981). A few details of this aggregate shift are especially pertinent to a consideration of how social changes alter specific opportunities for criminality. The surveys report that free time resulting from reduced work hours is often occupied by second and third jobs taken, in part, to pay for the purchase

of various household goods. If we consider this together with the increased participation of married women in the labor market (1975 U.S. Census as cited by Cohen and Felson, 1981), implications for the structure of opportunities for certain illegitimate activities become clear. More people working more jobs with greater frequency will increase the amount of time people spend away from their homes which, in turn, decreases the availability of capable guardians for the household and its property. Furthermore, some of the household items purchased with the additional income earned at those extra jobs will increase the supply of available targets.

The saliency of effects that changes in routines exert on opportunities for crime is clearer in light of the considerable evidence that suggests the importance of factors other than economics and offender characteristics in accounting for crime trends (Gould, 1969; Gibbons, 1971; Sparks, 1977; Hindelang, Gottfredson, and Garofalo, 1978; Cohen and Felson, 1981). For property crimes, these studies support the proposition that situational opportunities encountered by offenders underlie a large percentage of these crimes. If married female work force participation, the value of household items, and the amount of time spent away from home increase between two points in time, all else equal, the opportunities for household related property crimes will also increase. These changes in routine activities create greater opportunity for household property victimizations by decreasing the availability of capable guardians for the home and increasing simultaneously the suitability of the target. Therefore, the probability of convergence for the three necessary components of a household victimization increases.

Biographical accounts (e.g., Letkemann, 1973; Klockars, 1974) and interviews with convicted burglary offenders (Reppetto, 1974) demonstrate the importance of these behavior patterns for law breakers who regularly seek the most vulnerable and attractive target available. These three studies also illustrate the relevance of opportunity-related variables to different types of offenders. A professional thief in Letkemann's study emphasizes that an attractive target's vulnerability is regularly assessed by watching routines (e.g., opening and closing times, customer traffic, security arrangements) associated with the business before deciding when and how to proceed with crime. Vincent Swaggi, Klockars' professional fence, gives the example of purposively seeking street intersections in the city where traffic congestion is most likely to enhance the opportunity for "boosting" the contents of delivery trucks. Many of the housebreakers Reppetto studies explain that they often check a residence for occupants before attempting a burglary. For example, one burglar explains that he first rings the doorbell. If someone responds he poses as a door-to-door salesperson or asks for a ficticious person before leaving to find a more vulnerable target. If the doorbell is unanswered, however, he moves forward with his plan to break and enter.

These examples provide germane illustrations of the interdependent adaptations inherent in the ecological concept of a human community. A segment of the population involved in legitimate activities modifies its routines (e.g., gets a second job, spouse takes a job outside the home) in response to complex personal, social, cultural, and economic forces. These changes then prompt reactions by a different subgroup of the population (those involved in certain illegitimate activities), thereby

influencing the rate and pattern of criminality. Such a set of circumstances serves as a criminologically relevant description of human symbiosis.

This general outline of symbiotically interdependent subgroups within the human population forms the foundation for the criminal opportunity perspective set forth by routine activity theory. Changes within spheres of legitimate activity (i.e., daily routine activities) precipitate changes in the likelihood of criminal victimizations by altering situational factors which either enhance or inhibit the opportunity for motivated offenders to commit crimes. By explicitly seeking explanations for longitudinal trends in criminal victimization, Cohen and his colleagues posit specifically that changes in the daily routines of legitimate actors account for subsequent changes in the crime rate.

A Routine Activity Theory of Crime

A primary contention of the routine activity approach is that societal-level changes in production activities and consequent alterations in routine activity patterns act together to influence opportunities for certain types of victimizations. Trends in the production of durable goods (e.g., miniaturization in electronics) affect a property crime target's suitability for victimization by furnishing items which are valuable, accessible, and portable (Cohen and Felson, 1979). In addition, Cohen and Felson (1981) note that changes in typical activity patterns associated with more women in the labor market and the tendency to spend more time away from home prompt changes in the type, tempo, and location of routine activities. These types of social changes

affect the structure of daily routines and influence particular crime rates by influencing the target's state of guardedness and exposure.

Lifestyle and Victimization

Routine activities are consequences of, and largely synonymous with, styles of life. Lifestyle is a seminal concept in routine activity theory and criminal opportunity research in general. Hindelang, et al. (1978) conceptualize lifestyle as equivalent to daily routine activities and define lifestyle formally as: "a characteristic way of distributing one's time ... among the common social roles of adult life--those of worker, parent, spouse, citizen, ... and user of leisure time (Havighurst, 1961, p. 333 as cited by Hindelang, et al., 1978 p. 244-245). Hindelang and his associates expand this definition slightly to include juveniles and then consider how different styles of life and their antecedents are associated with differences in exposure to those circumstances with a high risk of becoming the victim of rape, assault, robbery, or personal larceny (see Chapter 11).

Within this lifestyle context, Cohen, Kleugel, and Land (1981) posit that five mediating variables explain the bivariate patterns usually found in the study of the relation between crime and race, age, or income. Four of these variables are risk factors associated with different lifestyle activities: (1) exposure, (2) guardianship, (3) proximity to potential offenders, and (4) target attractiveness. The fifth involves definitional properties of the crime.

These five variables explain specifically the theoretical mechanisms that connect social structure, routine activities, and opportunities for certain crimes. Exposure and attractiveness refer to

the potential crime target's suitability for victimization and guardianship alludes to the target's vulnerability. The proximity variable refers to the supply of motivated offenders capable of taking advantage of the opportunity to commit a crime presented by a vulnerable and exposed target. The fifth factor is listed by Cohen et al. because it establishes the relevant context within which the first four opportunity variables interact. A brief example will clarify this last point.

Crime, when used to label behavior or occurrences, refers to many diverse phenomena. Labelling an event a crime implies something about how society views the occurrence and tells us how a community chooses to react to these circumstances. It tells us very little, however, about the act itself. Aggravated assault and burglary are both UCR index crimes but involve targets, behaviors, and circumstances that are very different. Situational opportunities which affect the likelihood of each crime are also quite likely to be different.

Activities and circumstances that combine to ncrease the likelihood that someone will be the victim of a serious assault do not necessarily affect the chances for other criminal victimizations in the same way. In fact, it is easy to think of situations where the same circumstances can enhance the opportunity for one type of crime while decreasing the probability that another crime will take place. For example, if the employed spouse in a one-career family stops working for some reason (i.e., layoffs), all else equal, the household is less likely to be a target for burglary (according to routine activity theory) because of the additional guardian for the property and the increased

activity around the home. The opportunity for aggravated assault between the married couple is enhanced, however, if the frequency of serious personal injury arising from familial violence is considered. The same occurrence (being laid off) inhibits the chances of a burglary victimization at that residence, yet enhances the opportunity for serious spouse abuse. Exposure to burglary is decreased while exposure to serious injury at the hands of a spouse is increased.

By taking criminal motivation as a given and focussing on the interplay of risk factors as they affect certain crimes, one can consider how trends and changes in social conditions and lifestyle affect the frequency with which the minimal components of victimization converge. It is therefore possible to construct an explanation of temporal trends in victimization rates.

Cohen, Felson, and Land (1980) make two explicit assumptions relevant to a consideration of how variations in routine lifestyle activities of legitimate actors affect criminal opportunities:

> (1) Offenders prefer targets with fewer guardians.
>
> (2) Persons related to an individual by secondary group ties, or persons who do not share a stable relationship and do not themselves have norm-enforcing role obligations, are less likely to act as guardians for each other or their property than persons involved in primary group relations.

Given these assumptions, they derive a theorem:

> Decreased (population) density in physical locations that are sites of primary group routine activities produces an increase in criminal opportunity.

Regardless of target, then, routine activity theory hypothesizes that opportunities for certain crimes will increase as patterns of daily routines shift from sites characterized by primary group relations (e.g., immediate family) to situations where people are related to one another in a less intimate manner. Stated more generally, this perspective maintains that opportunities for certain crimes will vary as a function of changes in the patterns of daily routines.

Formal Definitions and Assumptions

It is now possible to relate the structure of routine activity theory and the necessary definitions as set forth by Cohen and his colleagues. They seek to explain temporal trends in direct-contact predatory crimes. These crimes are " ... illegal acts in which someone definitely and intentionally takes or damages the person or property of another ... [and violations] ... involving direct physical contact between at least one offender and at least one person or object which that offender attempts to take or damage" (Cohen and Felson, 1979: p. 589). The general framework links aspects of routine activities with criminal opportunity structures.

Definitions.[3] The definitions for the intervening risk factors set forth in the theory and used in this research are:

> Exposure: the physical visibility and accessibility of persons or objects to potential offenders at given time or place.
>
> Proximity: the physical distance between areas where potential targets for crime reside and the areas where relatively large populations of potential offenders are found.

Guardianship: the effectiveness of persons (e.g., housewives, neighbors, pedestrians, private security guards, law enforcement officers) or physical security measures (e.g., burglar alarms, locks, barred windows) in preventing violations from occurring, either by their presence alone or by some indirect action.

Target Attractiveness: the material or symbolic desirability of a target to potential offenders, as well as the perceived invulnerability of a target to illegal intrusion (i.e., the weight and size of property that discourages its theft and the physical capacity of persons to resist attack). Furthermore target attractiveness is differentiated on the basis of whether the motivation to commit a crime is primarily instrumental (i.e., the act is a means of acquiring something one desires or needs) or expressive (i.e., the act of attacking a person or stealing property is the only reward sought in doing so).

Definitional Properties of Specific Crimes: the features of specific crimes that act to constrain strictly instrumental actions by potential offenders. For example, many larcenies are less difficult to commit and require less knowledge of victim routine activities than do burglaries (see Assumption 5 in the next section). Such constraints limit the ability of potential burglary offenders to consistently act against targets that would maximize their economic gain, thus requiring them to seek out less attractive targets. By comparison, crimes motivated by expressive needs (e.g., aggravated assault during an argument) are less constrained.

Assumptions. There are five assumptions about links between the risk factors defined above and the likelihood of criminal victimization.

Exposure: all else equal, increased exposure leads to an increase in victimization risk.

Guardianship: all else equal, offenders prefer targets that are less well-guarded to those that are guarded more closely. Therefore, the greater the guardianship, the less the risk of criminal victimization.

Proximity: all else equal, the closer the residential proximity of potential targets to relatively large populations of motivated offenders, the greater the risk of criminal victimization.

Attractiveness: all else equal, if a crime is motivated by instrumental ends, the greater the attractiveness of a target, the greater the risk of victimization.

Properties of Crimes: the strength of the partial effects exerted by exposure, guardianship, and proximity on victimization risk depends upon the degree to which properties of crimes themselves constrain strictly instrumental action. Specifically, the more a criminal action is constrained as strictly instrumental, the stronger will be the effects of exposure, guardianship, and proximity on victimization risk relative to the effect of target attractiveness.

Empirical Tests of Routine Activity Theory

A discussion of the research literature pertaining to the routine activity theory must be prefaced by a comment on the crime-specific design of these studies. Since the type of crime both establishes the context within which the other risk variables operate and shapes interpretations by defining the relevance of certain daily activities to certain crimes, the type of crime must be represented in the study design. This is usually accomplished either by studying one type of crime or by conducting separate analyses for each crime. Of course, this applies to the present research and will be considered in the next chapter's discussion of this researcher's choice to study burglary victimizations.

The relevant point here is that studies testing the routine activity perspective present findings and conclusions stated in terms of individual crime categories. Strictly speaking, a study focussing solely on burglary might be expected to concentrate only on results that relate to burglary. The purpose of this brief review is more general, however. Attention is given in this section to the overall performance of a routine activity model rather than crime-specific details of the

results. Of course, accuracy requires that conclusions and relationships be discussed in terms of the crime to which they apply. But the main concern is not a comparison across crime types of the association between an opportunity-related variable (e.g., income) and victimization. The relevant question is whether the relationships are of a type and direction that are consistent with the routine activity framework. This will provide an overall picture of how well the theory survives tests of its major propositions.

The relatively few studies that bear directly on these questions can be divided into two categories. One involves longitudinal studies that address the overall performance of a routine activity model by analyzing how well the perspective accounts for long term trends in crime data. The second category includes specific cross-sectional tests of hypotheses generated by the theory. The discussion begins with the latter group of research efforts.

Cross-Sectional Research

Research designed specifically to evaluate certain theoretical components of routine activity theory is largely supportive. The partial coefficients used to test the effects of risk variables hypothesized as mediators between demographic characteristics and victimization for the most part confirm such relationships. Cohen and Cantor (1980), in their study of personal larceny (using NCS data from July 1975 to June 1976), obtain coefficients of partial determination that indicate a negligible effect for race. Somewhat unexpected, however, is the finding that age has a strong main effect that is associated negatively with the risk of personal larceny, followed in magnitude by major household activity (categories are employed, unemployed, keep house). The number of people

in the household displayed a negative relation with personal larceny, while income is related positively. These results lead the authors to the substantive conclusion that those with yearly incomes of $20,000 or greater, those between sixteen and twenty-nine years old, those who live alone, and the unemployed all face an above average risk of being personal larceny victims. In contrast, people who are fifty years of age or older and those who keep house rather than work have a below average risk of becoming a victim of personal larceny.

The authors present detailed analyses suggesting that some interesting interactions affect the risk of personal larceny victimization. Individuals who are between sixteen and twenty-nine years old and in the middle income category ($10,000 to $19,000 per year) have relatively high chances of being victimized. Older citizens, by comparison, are less likely to become victims if they either fall in the lowest income category or keep house as their major household activity. here is a greater risk for all those in the lower income categories if they keep house or work than if they are unemployed. Lastly, victimization risk is highest for those who live alone when they are unemployed compared to the other major activity categories.

In a subsequent study of residential burglary, Cohen and Cantor (1981) seek the characteristics of individuals and aspects of their lifestyles that are associated differentially with the risk of burglary victimization. This study relies on the same data set as the study on personal larceny. Stated in summary fashion, the authors conclude that the types of people heading households that have a higher than average risk of becoming burglary victims include: central city residents (central city/non-central city dichotomy), the youngest (three

categories: ages 16-29, 30-49, and 50 or above), those in the highest or lowest income groups (four categories: income below $7,500; $7,500-$14,999; $15,000-$24,999; $25,000 or more), the nonwhite, and those whose households are unoccupied frequently. In comparison, homes are least likely to suffer a burglary when the head of household is older, has an income in one of the two middle categories, lives outside a central city, and when the home is occupied relatively often. Additional analysis, again utilizing coefficients of partial determination, reveals that age of household head is the strongest predictor of burglary victimization followed in order of importance by area type, income, household occupancy, and race.

There are also significant interactions among variables associated with higher or lower than average risks of burglary victimization. The characteristics related to a lower than average risk in order of magnitude include: over 49 years old with less then $7,500 in annual income, age 30 to 49 with an income between $15,000 and $24,999, age 16 to 29 with an income of $15,000 to $24,999, age 30 to 40 in either the $7,500 to $14,999 or over $24,999 income brackets, and age 16 to 29 with an income of $25,000 or more. The significant interactions that relate to a higher than average risk are, listed in order of magnitude: those 30 to 49 years old with incomes below $7,500, those over 49 with incomes between $15,000 and $24,000, 16 to 29 year olds that have incomes less than $7,500, and those 50 or older with incomes of more than $24,999 or between $7,500 and $14,999.

These results are mainly supportive of the theory. Cohen and Cantor (1981) offer a post hoc interpretation for the parabolic shape of the relation between income and the risk of burglary. Since this

association retains its U-shape inside and out of central city areas, the authors contend plausibly that this reflects the operation of two types of burglars. For one group, proximity to targets may be the most important factor. A disproportionate number of these offenders might live in low income areas of central cities and outlying areas. Because this group lacks mobility, potential offenders concentrate on situational opportunities encountered within (or near) their own neighborhoods to burglarize homes of the poor. In contrast, a second group of more professional burglars, for whom target affluence is a major consideration, may victimize richer households.

In addition to questions of household affluence, other results suggest the importance of victim's routines near or away from home in accounting for certain vicimizations. Although not among the strongest predictors analyzed, households more frequently occupied by capable guardians are less likely to be burglarized than homes that are occupied less often. This points directly to the importance of household exposure postulated by the theory. Further evidence of exposure's importance can be seen in the result that age is the strongest predictor of both burglary and larceny. Cohen and Cantor (1981) cite survey data from the U.S. Census that show young people tend to spend more time away from home than do older people. This would explain the lower rates of burglary victimization among older citizens; they are home more often than the young and able to better guard their property.

The negative relation between age and personal larceny can also be explained by the different patterns of activity displayed by the young and old. Personal larceny is a crime that tends to occur away from home. One expects, therefore, that older people who tend to remain at

home will be exposed to the risk of personal larceny less often than the young. Another of the variables found to be associated with a higher risk of larceny (Cohen and Cantor, 1980) bolsters this interpretation. The major activity variable showed that those who spend more time away from home (e.g., the unemployed looking for work) are subject to a higher risk of personal larceny than those who remain home comparatively more often.

Longitudinal Studies

In contrast to the studies just reviewed, research that tests the overall temporal stability of the structural factors hypothesized by routine activity theory relies on analyses of aggregate data--UCR crime rates and various types of census data. This genre of research employs measures of social structures presumed to influence the convergence in time and space of the three components necessary for a victimization. The emphasis is on accounting for long term fluctuations in rates of reported cime by using measures of social conditions as criteria variables.

Many other efforts to model crime trends focus on economic factors (e.g., Brenner, 1976) or demographics (Fox, 1979). Traditional variables such as unemployment and poverty perform less than satisfactorily, however, when used as predictors in forecasts of crime rates. Cohen and Felson (1981) show that measures of poverty, unemployment, and age structure do not account for changes in the UCR reporting rates for robbery, burglary, larceny, and auto theft between 1947 and 1974 (see Table 1, p. 145 and Table 2, p. 147). None of those variables reach a .05 significance level. Moreover, the direction of each relationship is opposite of that which might be expected. The

authors argue that if poverty and unemployment are useful in explaining longitudinal crime trends, crime will vary inversely with their poverty ratio. This measure is the ratio of the income of the bottom fifth of the population to median income; it increases as the economic conditions improve for those in the lowest stratum of wage earners relative to the higher income groups. On the other hand, crime is expected to vary directly with the unemployment rate.

Both independent variables, however, achieve coefficients with signs indicating relations with crime that are opposite from the predicted direction. The results show a direct association between each of the property crimes and the poverty ratio, and a negative relation between each crime and unemployment. These results suggest that property crimes increase as the relative income of the poorest improves and they decrease as unemployment rises. Substantively, these findings are more supportive of the opportunity perspective than the more traditional approaches in criminology which argue that crime is expected to increase as poverty worsens. But the weak associations (neither the poverty ratio nor the unemployment rate reach a 5 percent significance level) suggest the need to specify such models differently. This conclusion is reinforced, the authors note, by the fact that they are able to accept the null hypothesis of no autocorrelation of residuals only when forecasting trends in burglary. Well-specified equations permit the acceptance of the null.

There are several studies that respecify longitudinal models so they perform better and forecast more accurately. Specifically, this research uses measures of the major opportunity-related variables (proximity, guardianship, target attractivness, exposure, and properties

of the crime) in longitudinal assessments of crime rates in place of or together with the standard variables which reflect economic conditions and attributes of those thought to be the most likely offenders.

Cohen and Felson (1979) present the results of a time series analysis in which they evaluate the effects of household activity on trends in the rates of five UCR index crimes (non-negligent homicide, forcible rape, aggravated assault, robbery, and burglary) from 1947 to 1974. They construct a household activity ratio which estimates the proportion of U.S. households that are expected to be most highly exposed to the risk of victimization in a given year because of a greater distribution of activity away from the home. Routine activity theory asserts that crime and this activity ratio are directly related.

The results show a statistically significant, positive association between the ratio and each crime rate. The robustness of this relation is evident in the fact that the relationship persists whether unemployment and population age structure variables are entered into the equations as controls. The strength and direction of the relationships lead the authors to conclude that household activity is an important explanatory variable for temporal fluctuations in each of the five crime rates, and suggest that routine activities influence opportunities for crime. The likelihood that households or their members will be targets for one of these crimes increases as members of those households spend more of their time away from home.

Cohen and Felson (1981) extend these findings by formulating three other substantive variables. They construct measures of married female workforce participation from U.S. labor statistics, the incidence of people living alone from U.S. Census Bureau data, and the presence of

lightweight durable goods from national consumer spending patterns. These variables are employed as social production functions to gauge the effects changes in these social functions exert on trends in the reporting rates of robbery, burglary, auto theft, and larceny over $50. Through a series of steps to construct the pertinent indices, and the addition of age and unemployment variables along with the number of automobiles per capita, the researchers " ... operationalize [and analyze] the impact of offender, target, and guardianship trends upon crime rates in terms of changes in the age, and routine activity structure and, hence, the criminal opportunity structure" (p. 148).

Their analysis is conducted in two stages. In the first, stochastic equations which model crime trends in robbery, burglary, and auto theft between 1947 and 1972 are estimated. Larceny is also modelled, but for 1947 through 1970 due to limitations imposed by the data. In general, the equations perform quite well; relationships are found to be of the size and type expected. Relatively modest increases in social indicators studied (e.g., supply of lightweight goods) account for large increases in burglary and larceny. (See Tables 3-6 in Cohen and Felson, 1981: p. 149-153 for details).

The second stage of analysis, viewed by the authors as the major test of the theory, involves ex post forecasts of the crime rates.[4] Results of the first stage estimation of trends in robbery, burglary and auto theft are used to forecast trends in these crime rates for 1973 through 1975. For larceny, the early estimates are used to forecast for 1971 and 1972. (This is because the UCRs stopped recording data on larcenies of $50 or more).

From an opportunity perspective, the results of these forecasts are encouraging and show the important role played by opportunity-related variables in the prediction of crime trends. (See Table 7 and 8, Cohen and Felson, 1981, p. 156-157). The three-year average error in forecasting rates are 4.6 and 1.9 percent for robbery, 3.8 and 5.5 percent for burglary, and 1.5 and 2.0 percent for auto theft. Two-year average errors in forecasting larceny rates are also rather low: 1.3, 1.5, 1.7, and 2.5 percent. Each of the percent figures cited as errors represents the discrepancy between each rate forecasted from an equation and the rate actually recorded. Two equations are estimated for each of the first three crimes and four equations for larceny. With a mean forecasting discrepancy of 4.9 percent, and no pattern of systematic forecasting errors, the authors are justifiably satisfied with the overall performance of their models.

Evaluating the Evidence

Cohen and Felson (1981) argue that the accumulated evidence provides important confirmation of the theory. They point appropriately to some of the early cross-sectional studies that stress the importance of opportunity-related variables in general (e.g., Gould, 1969) and the lifestyle variable in particular (e.g., Hindlelang, et al., 1978) in the explanation of criminal victimization patterns. The cross-sectional tests of routine activity hypotheses (e.g., Cohen and Cantor, 1980; 1981) support the idea that the structure of daily routine contributes to certain crimes by influencing the risk factors of exposure, guardianship, proximity to offenders, and target attractiveness associated with particular types of offenses. However, the cross-sectional design of

these studies does not permit a satisfactory test of the thesis that changes in the character of routines over time account for longitudinal trends in victimization rates.

Lastly, the longitudinal studies reviewed in the foregoing section confirm the perspective's postulate that social changes since the end of World War II have increased the occurrence in time and space of motivated offenders, suitable targets, and the absence of effective guardians, thereby contributing to increases in crime rates. However, this last body of research does not address adequately the theory's main thesis that temporal variations in the daily activities of individuals increase or decrease the probability that components necessary for a criminal victimization will converge and influence crime trends (Cohen and Felson, 1979; Cohen and Cantor, 1980).

It is not surprising that Cohen and his associates focus on macro-level concerns in their longitudinal assessments of the theory. Their main interest involves macro-sociological issues. This point is made clear by Cohen and Felson (1979) when they state:

> Although details about how crime occurs are intrinsically interesting, the important analytic task is to learn from these details how illegal activities carve their niche within the larger system of activities. (p. 592)

The authors continue immediately after this passage to compare their research with other efforts by scholars to link criminal activities with the larger social and economic structures. Given this focus of attention, the authors undertake to show that their approach is consistent with what is known about micro-level relations; they deliberately eschew longitudinal tests at that level in favor of macro-level assessments.

The use of econometric models to analyze and forecast crime trends (Erlich, 1973; Land and Felson, 1976; Cohen, Felson, and Land, 1980; Cohen and Felson, 1981) is particularly germane. Econometric models are explicitly longitudinal and well suited to a study of crime trends. Econometric models commonly employ highly aggregated measures in attempts to analyze societal trends and relations. National crime rates and the macrodynamic social indicators used by Cohen et al. in their research (e.g., female labor participation and the supply of lightweight durable goods) are illustrative examples. This poses a significant methodological problem, however. Decker and Kohfeld (1982) criticize Fox (1978) for ignoring regional variation in UCR trends. This criticism applies to all analyses of national UCRs, of course. Fox (1982) responds correctly that, aggregation bias notwithstanding, the aggregation criticism is relative. If a model purports to explain national trends, then aggregation may be appropriate. However, aggregate data and macro-level indicators of social functions do not permit adequate tests of the individual-level thesis set forth by routine activity theory.

Although Cohen and his associate rely heavily on analyses of aggregate data (e.g., Cohen and Felson, 1979; Cohen, Felson, and Land, 1980), their most recent work (Cohen, Kleugel, and Land, 1981) analyzes NCS victimizations. The difference between the two approaches is focus. In the first case, they focus on macrodynamic trends across the post-war era; the time frame is decades. In the second case, they focus on tests of specific hypotheses; assuming system equilibrium, they examine causal relationships at one point in time. Generally, the opportunity model of victimization, with its emphasis on structural risk factors, seems to provide a powerful explanatory framework, analytic difficulties aside.

The research proposed here will strike a middle ground. Analyses will be explicitly longitudinal, focussing on the effects of changes in routine activity of individuals on opportunities for burglary victimization. But of necessity, the analysis will cover only the period from 1977 to 1981 for which appropriate NCS victimization data are available.

There are, of course, important issues which have been ignored in an attempt to provide an overview of the routine activity perspective. The material discussed thus far involving the theory characterizes it as a framework which explains crime-specific longitudinal trends in criminal victimizations at the social and individual level. As such it represents a major departure from traditional ecological approaches which, for the most part, concentrate on much higher aggregation levels. John Laub's (1980) work on rural and urban patterns of crime, and the city-level investigation by Gibbs and Erikson (1976) are representative of the macro-level analyses generally associated with ecological inquiries. The divergence of routine activity theory from that tradition raises substantive and theoretical issues that pertain to important questions including the crime under study, the analytic techniques employed, and the nature of the data set to be analyzed. These are all important considerations for meeting the major objective of this study: to test the causal relationships between changes in household activity structures and burglary victimization that routine activity theory posits. These design issues receive individual discussion in the next two chapters.

NOTES

1. For an excellent historical review of the early ecological crime literature, refer to Wilks (1967).

2. The concept of lifestyle plays a central role in the routine activity framework and will be discussed more fully in a later section.

3. The following formal definitions and statements of assumptions rely heavily on Cohen, et al. (1981, p. 507-509).

4. If a researcher does not have very current social data, it is difficult to make accurate forecasts into the near future. The way Cohen and Felson choose to avoid this problem is by going back a few years to forecast crime rates which are already reported. Comparisons between the known rates and those provided by the statistical analysis permits evaluation of the forecast model being employed. This procedure is known as ex post forecasting.

CHAPTER 3

Substantive and Theoretical Issues

It is, of course, axiomatic to assert that the design of scientific studies testing theoretical frameworks must be guided by the structure set forth in that theory. Such congruence is crucial for adequate, powerful assessments. Chapter 2 concludes by characterizing the routine activity theory as a perspective that purports to explain longitudinal fluctuations in specific criminal victimizations as causal functions of changes in the daily routines of potential victims. These three conceptual features of the theory--its crime-specific nature, the causal hypotheses, and its individual (household) focus--have important implications for the design of this research. The second two features relate directly to the type of sample necessary for an adequate test of the theory, and the nature of analytic procedures appropriate for assessing the major tenets of routine activvity and for supporting causal interpretations. The issues of sample design and the analytic course of this research are discussed in Chapter 4.

The issues of immediate concern in this chapter relate to the crime specific applicability of this criminal opportunity perspective. The choice of a particular crime through which to test the assertions set forth under routine activity is not completely arbitrary; limitations of the available data, modelling concerns, the character of previous research, and the structure of the theory impinge, to various degrees, on

that choice. This chapter begins by explaining this author's decision to focus on residential burglary, and then reviews recent literature that pertains to the patterns, characteristics, and analysis of burglary.

Crime-Specific Application of Routine Activity Theory

Aggregation bias can be a problem when crimes are grouped into categories. Designations such as "serious," "property," or "violent" can mask potentially important variability that exists among the individual crimes that comprise each broader category. It is difficult to think of a variable that uniformly affects any set of generally defined victimizations. This is particularly true of variables relevant to criminal opportunity structures in general and the routine activity theory specifically. It is quite likely that a routine activity theory of burglary involves different structures and relationships than a routine activity theory of robbery or assault. The definitional elements of the crime influence differentially which structural variables are relevant and, perhaps, the direction of their interrelationships. For example, it seems reasonable that, if this opportunity theory of victimization is correct, a shift in routine activities precipitated by the loss of employment by the one person in a married household who works outside the home, decreases the risk of burglary victimization (since effective guardianship of the home improves), while increasing the risk of becoming the victim of familial violence (because the married couple will presumably spend more time together). Changes in routine activity patterns that result from this particular shift in employment status alter certain criminal opportunity structures such that the likelihood of spousal assault is increased, but the chances of becoming a burglary victim decrease.

Hindelang, Gottfredson and Garofalo (1978) make an analogous point in their discussion of individual interactions and physical surroundings. Suburban shopping centers are often established by business people who wish to locate their enterprises away from the high crime of inner cities. While it might be true that such areas have comparatively low rates of crimes involving personal contact (e.g., rape or robbery), the large congregation of unattended vehicles is amenable to higher rates of crimes such as auto theft or larceny that do not involve personal contact between victim and offender. Clearly, the same set of circumstances and structural array is not expected to affect the rates of all crimes uniformly or even similarly.

Researchers who examine extant relationships between structural factors and crime rates consistently report differential effects across crime categories. Decker, O'Brien, and Shichor (1979) report wide variation in the magnitude of associations between indices of urban structure and various contact and non-contact victimizations of juveniles. Concentrating on violent crimes, Block (1979) states that although proximity to poor and middle class residents is the best predictor of victimization among the neighborhood characteristics considered, the range of variation in both the rates and types of crime is much larger in low proximity neighborhoods than those with a high proximity. He concludes that different structural characteristics seem to interact with and affect certain crimes selectively. Similarly, scholars who examine the specific influence of structural density on crime find that the magnitude of associations between victimization rates and density varies with the type of crime (e.g., Sampson, 1983). If, as these results suggest, elements of crimes interact differentially with

ecological structures, then it is reasonable to expect individual crimes to relate differentially to patterns of change in those structures. There is little reason to expect the effects of changes in ecological structures to be equal or similar across victimization types. This point is obviously crucial to the opportunity perspective, since changes in crime rates are attributed to changes in routine activities. An accurate assessment of the precise relationship between these structural factors and victimization requires that crimes be studied individually.

Residential Burglary

The decision to limit this inquiry to residential burglary is guided by theoretical and practical considerations. Property crimes such as residential burglary differ from personal crimes (e.g., robbery and assault) in that the former lacks personal interaction between offender(s) and victim(s). Considerable research indicates that who the victim is, the relationship that exists between the offender(s) and intended victim(s), and some actions (e.g., self-protective measures) taken by the victim profoundly influence the occurrence and ultimate outcome of crimes against persons (see, Wolfgang, 1958; Amir, 1971; Hindelang, Gottfredson, and Garofalo, 1978; Toch, 1980). The apparent influence of interpersonal contact in crimes against persons requires that the nature of that interaction be considered explicitly in explanations and analysis of personal victimizations. The definitional elements of property crimes, on the other hand, make it possible to eliminate the confounding effects presented by a victim-offender confrontation, thereby simplifying the process of multivariate model-building, testing hypotheses, and interpreting the results.

Of the predatory property crimes available for analysis, residential burglary is an appealing choice. Compared to the other non-contact crimes, residential burglary is usually ranked as more serious than either larceny or auto theft, independent (to some degree) of the amount stolen (Conklin and Bittner, 1973). From 1973 to 1978, the NCS data show that household larcenies outnumbered burglaries by approximately 1.3 to 1.0 (Hindelang, Gottfredson, and Flanagan, 1981); yet, Repetto (1974) finds burglary to be the quintessential residential crime in the minds of potential victims despite the greater frequency with which larcenies occur. The cliche about a home as a family's castle is not taken lightly by most people. This might explain the psychological intrusion victims often feel after a burglary violates the sanctity of their homes (Lavrakas, 1981). People expect safety within their homes and expect others to honor the privacy and security inherent in another's residence.

Finally, there is a large body of research that describes the victim, offender, target, and environmental characteristics associated with residential burglary. Such a descriptive foundation is useful in its own right and is an essential ingredient for further theoretical development. Firm descriptive underpinnings must precede the formation of unambiguous concepts which, in turn, provide the blocks upon which scientific theory is built (Durkheim, 1938; Gibbs, 1972; Turner, 1978). Previous research that outlines the various attributes of residential burglaries will be reviewed. The major studies in this area are discussed in terms of three themes relevant to this study: offense patterns, offender characteristics, and structural correlates.

Correlates of Residential Burglary

Research on the ecology of crime concentrates on the search for explanations of crime's non-random distribution through the population. Structural features are presumed to account for some of the differences that distinguish between areas with low and high crime rates. Specifically, this section examines studies that analyze the relation between burglary rates and geographic and population variables. The different structural aspects associated with variations in the level of burglary victimizations are of particular interest. Since routine activity theory hypothesizes that changes in social structure prompt changes in people's lifestyles, and that these changes in routines, in turn, influence opportunities for criminal victimization, the ways different structural arrays affect burglary rates are important and relevant.

Scarr (1973) adopts an ecological approach by correlating 1970 census data with official burglary statistics and victimization data for the census tracts he studies in the Washington, D.C. metropolitan area. The research explores spatial patterns of home burglaries in an effort to uncover the structural characteristics which facilitate such incidents. He concludes that it is not possible to distinguish between high and low rate areas by aggregate social indicators (e.g., poverty, educational level) in the suburban locations; these indicators are useful in urban areas, however, consistent with previous research (e.g., Boggs, 1965).

More recent ecological research presents additional evidence which confirms that particular physical characteristics (city size, percent owner-occupied housing, and geographical location) and population variables (ethnicity and median family income) are in fact correlated

significantly with the burglary rate (Dunn, 1974; Booth, Johnson, and Choldin, 1977; Sampson, Castellano and Laub, 1981). Byrne (1983) confirms that these variables explain a moderate amount of variance, and expands the inquiry by examining different size cities. Stronger relationships are achieved between burglary and both sets of variables (physical characteristics and population variables) for smaller than for larger cities. It seems that different ecological variables affect burglary rates differently depending on the size and nature of the population aggregate.

The usefulness of examing how different influences exerted by structural factors affect burglary is evident in a related body of research. Stafford and Gibbs (1980) offer a hypothesis posing an interaction between a population ratio (city/SMSA) and a city attraction variable referred to as dominance. The former variable represents potential attraction while the latter represents actual attraction. Therefore, dominance reflects the pull of people into a city to utilize the economic and social facilities. This phenomenon is measured by the percentage of SMSA retail sales accounted for by a particular city within the metropolitan area (city retail sales/SMSA retail sales). Stafford and Gibbs argue that:

> If a city has a high population ratio and high dominance . . . its gravitational potential (attraction to nonresidents) will be . . . manifested in a high crime rate. (p. 655)

They find dominance to be correlated negatively with property crime, but "city crime rates are directly related to the interaction of the population ratio and dominance, even after various racial and economic characteristics of cities are introduced" (p. 662). Focussing only on

correlates of burglary, however, neither dominance nor the interaction of dominance and population ratio is significantly correlated with the criterion. This suggests that these variables are relatively unimportant in an explanation of burglary; perhaps burglary is not a direct function of the flow of people into cities. As we shall see in a subsequent section, burglary in general and residential burglary in particular are typically committed by young offenders operating fairly close to their own homes. It is not very likely that young offenders who often lack mobility will be drawn to the opportunities of a central city. Therefore, it seems reasonable that the residential burglary rate of a given area will be largely unaffected by that area's transient population.

Family Income

Macro-level research provides mixed results concerning the relationship between income and burglary; the magnitude and direction of correlations often vary. For example, Schuessler (1962) reports a slight inverse correlation ($r = -.15$) between average income and burglary. Similarly, Harries (1974) reports that poverty (percent of all families below low income level) is negatively associated with burglary. Cohen and Felson (1981) and Sampson, Castellano and Laub (1981) reach the same conclusions, but other researchers find stronger associations. Flango and Sherbenou (1976), for example, conclude that poverty is the key to explaining intercity variation of burglary rates. Quinney (1966)also observes that median family incomes and burglary are much closely related. He reports a direct assocation in rural areas ($r = +.34$), a much weaker relation in cities ($r = +.03$), and no relationship in SMSA areas ($r = .00$). In contrast, Jones (1976) eliminates income from his

stepwise regression analysis of burglaries because he fails to achieve unstandardized regression coefficient that is at least twice as large as its standard error.

Although some disagreement exists on the nature of the relationship between aggregate measures of income and burglary, it is fair to say that the weight of evidence indicates an inverse association is generally reported with some variation in the magnitude. This presents an interesting discrepency with other research (see, e.g., Gillespie, 1977; Cohen, et al., 1980; Skogan and Maxfield, 1981) that shows households in low and high income brackets as the most frequently victimized; on the individual level, Cohen et al. (1980) attribute the inconsistent findings to inadequate multivariate controls. The need for appropriate controls notwithstanding, the discrepency might also be the result of distortion introduced by macro-level indicators. Median income or average income for a certain area might be too insensitive to detect the U-shaped distribution of burglary victimizations across income categories.

Braithwaite (1979), in his review of this literature, notes the inconsistency that characterizes research on the criminogenic properties of poverty. In a separate analysis of crime rates in 193 American cities, he finds that poverty (operationalized in both absolute and relative terms) does not add to the explained variance after controlling for an area's size. Income inequality (as measured by the GINI coefficient), however, does augment the variance explained for each of the seven index crimes. This line of research has been pursued by other reseachers, again with inconsistent results. Jacobs (1981) reports that income inequality is a good positively related predictor of burglary

rates in the 195 largest SMSAs for 1970 whereas Carroll and Jackson (1983) disclose a negative association with burglary in 93 cities for the same year.

The inconsistency of the ecological research in this area is a topic for further research; perhaps, as Carroll and Jackson (1983) suggest, it is an issue which must be addressed via specifically designed, longitudinal investigations. Regardless of the perspective adopted, and the different methodologies employed, a consistent identifiable strain which emerges is that individual crimes react differently to disparate patterns of change in societal structures (Gibbs, 1965; Wilks, 1967; Dunn, 1974; Laub, 1980; Cohen, et al., 1980). Moreover, there is persuasive evidence that generalizations about crime drawn from one population aggregate will not remain constant for other aggregates of different sizes (Schuessler and Slatin, 1964). These points, considered along with the relative inconclusiveness of the ecological literature, suggest the necessity for exploring specific dynamics associated with criminality.

Offense Patterns

Scarr (1973) analyzes residential and commercial burglary in Washington, D.C. and two of its suburban areas (Fairfax County, Virginia and Prince George's County, Maryland). He utilizes correlational analysis to differentiate residential from non-residential offenses and reports differences in the patterns of the two offenses. Residential burglaries occur more frequently than commercial burglaries and are more likely to occur during the day on weekdays. The finding that residential burglary occurs more often than commercial offenses, while accurate, requires elaboration. Pope (1975) probes this point in more detail and

reports that the rate of commercial burglary is actually the higher of the two based upon opportunity-specific rates computed for each type of burglary. The rates are based on the number of targets at risk and provide a clearer idea of the relative frequency with which these two crimes occur. Most burglaries of both types involve theft of moderately valued items ($100 to $500) (Pope, 1975) including, presumably, household merchandise that is easily converted into cash or to personal use. The intercity variation in the relative proportions of commercial and residential burglaries reported by Byrne (1983) further underscores the need for a crime-specific analysis because the two types of burglary involve similar activities within different contexts. It specifically points to the need for opportunity-specific analyses of burglary incidents.

A work quite similar to Scarr's is Clarke's (1972) study conducted in Charlotte, North Carolina. Also using census tract data, residential burglaries are found to be primarily daytime and weekday phenomena that ocur during the daylight hours. In addition, they occur predominately in low income areas. Clarke's study is different geographically than Scarr's; both studies concentrate on urban areas, but Washington, D.C. and its suburbs have a higher total population and are more highly urbanized than the Charolotte metropolitan area. Nevertheless, the results of both studies are compatible.

Conklin and Bittner (1973) concentrate their efforts on burglaries in one suburb over a one-year period and report results that are largely consistent with the other studies. They notice little

monthly variation in the offense rate, most losses were in the moderate range; and residential burglaries are most likely to occur during the day in the middle of the week.

Reppetto (1974) investigates spatial patterns of residential burglaries and robberies in the Boston metropolitan area by tapping data derived from many different sources. He employs official reports, surveys of victims and nonvictims, observations of physical security measures, and interviews with 97 convicted burglars. Besides confirming the results found by others regarding time of occurrence and nature of the theft, the diverse and rich data allow Reppetto to provide greater insights that suggest trends and areas for further inquiry. Victimization rates and income are related positively regardless of race. The only difference in victimization patterns that exists between blacks and whites is that blacks are more likely to suffer multiple victimizations. Those most likely to be burglarized are the young, single, better educated, and those who more frequently leave their homes unoccupied. Lastly, the actual experience of victimization often prompted a response in that those who were victimized were more likely to enhance their home's security by installing alarms or additional locks.

Hindelang (1976), in his analysis of 1972 victimization data in eight cities, finds that the rate of residential burglaries is higher for renters than homeowners. His findings on time of occurrence and amount of loss are generally in line with the other studies although precise comparisons are not possible since Hindelang used a different breakdown for his time categories: 6 A.M. to 6 P.M. (35 percent occurred) and 6 P.M. to 6 A.M. (46 percent occurred).

Offender Characteristics

Most inquiries into the characteristics of burglary offenders have been limited to those apprehended. Routine activity theory posits one risk factor (proximity to offender population) that is concerned directly with offender types. Assuming comparability of official arrest data and the offender information elicited in victim surveys (see, Hindelang, 1974; 1977), and the similarity between victimization data and official accounts of burglary incidents (Pope, 1976), personal characteristics of arrested burglars will provide a fairly accurate picture of this offender population.

Burglary research undertaken by the Santa Clara Criminal Justice Pilot Program (1977) includes an examination of offender characteristics in San Jose, California. The report indicates that 81 percent of those apprehended were males while only 6 percent were female. Whites comprised 51 percent of the group, Mexican-Americans accounted for 26 percent, and blacks for 9 percent. Of those arrested, 58 percent were adults and 38 percent were under 18 years old. Forty-six percent of the time a single offender was caught, whereas more than one was arrested in 54 percent of the cases.

Chimbos (1973) also reports that the vast majority of apprehended burglars are male. In fact, all the females that are in his sample from a Canadian city had been arrested along with at least one male. Of those incarcerated, 57 percent had acted with one or more other persons with an overall mean age of 17.

Repetto's (1974) results after interviewing 97 adjudicated burglary offenders and supplementing that information with checks of official records prove rather interesting. Residential burglars tend to

be young and non-white -- quite consistent with the other studies. He went beyond the basic demographic data, however, to provide additional insight into the burglary offender and the crime. Seventy-three of those interviewed stated that they engage in some planning to a certain degree prior to the offense, and all specifically seek unoccupied dwellings. Careful attention is given to the rhythms associated with the travel and work patterns of household occupants. Furthermore, offenders who are young and non-white tend to commit burglaries in own neighborhoods, with apparent affluence one of the foremost factors influencing the choice of a burglary target.

Pope (1977a; 1977b) conducts a more extensive analysis of offender attributes using prediction attribute analysis and cluster analysis to examine the characteristics of those apprehended for burglary in six California jurisdictions over a one-year period. Although the specific aim of Pope's work is to explore interrelationships between burglary incidents and those apprehended for burglary, his findings regarding offender characteristics are relevant. Juveniles were more likely to commit offenses during daylight in their own neighborhoods, although females tend to do so away from their homes. Both sexes of juveniles were found to act in the company of others.

Synthesis of Findings

The consistency of the results reported by those who the distribution and characteristics of residential burglaries makes it possible to summarize concisely the picture that emerges. Burglaries of homes tend to take place during the daylight hours of weekdays, at houses that are relatively unguarded (e.g., because of work patterns), and when a theft accompanies a break-in, it usually involves items of moderate

value taken from relatively affluent households. Those committing the offenses tend to be young (under 18 years old) black males acting with one or more of their peers within their own neighborhoods. Hindelang's (1976) investigation of these issues shows an apparent interaction between household affluence and the tendency of burglars to concentrate on targets to which they have easy access. He notes the overall positive relation between the burglary rate and household income (within racial groups), but contrasts this with the data showing blacks in the lowest income group with a rate of burglary victimization higher than white families in all income categories except the highest. This suggests that target affluence is of secondary importance to accessibility since black, comparatively poor households are chosen as targets for burglary instead of the richer white households because the former are more accessible to the population of burglary offenders. At the very least, this indicates that, given a choice, burglars will select targets that are (or appear to be) more attractive.

These data clearly suggest the importance of variables relevant to the opportunity structure of burglary. Factors affecting the potential risk of residential burglary victimization include such things as the age, marital status, employment status, and income of the residents, and proximity of the dwelling to the offender-prone populaton. These empirical regularities lead Hindelang (1976) to conclude that factors other than offender characteristics account for crime trends and hold much promise as a guide for further research. This is particularly true, Hindelang reports, of lifestyle variables that seem to occupy an important position in the explanation of victimizations.

Hindelang, et al. (1978) explore these patterns further with regard to personal crime victimizations and specifically ask why these personal characteristics are so often associated with higher rates of victimization. They argue that the patterns of victim attributes which result in higher likelihoods of criminal victimization are factors that might be associated with differences in personal styles in life. These lifestyles are related differentially to various opportunity structures that either inhibit or facilitate the occurrence of a crime. They continue to develope this lifestyle/exposure hypothesis into an empirically grounded theoretical model explaining personal victimization (see Chapter 11, 1978). The key concept for Hindelang et al.'s model and the one proposed by Cohen and his colleagues is, of course, lifestyle. Both rely on patterns of life cycles to explain the distribution of victimization rates and Cohen et al. carry the idea further by attributing temporal variations in crime trends to changes in the usual life rhythms (daily routine activities).

There is an issue related to the lifestyle-victimization association that has until recently escaped attention in the literature, yet could potentially influence the theory's structure and certainly has methodological implications. The question of reciprocal effects deserves specific attention in a routine activity model of residential burglarly. The ommission of feedback hypotheses in this context is arguably a significant oversight in the work completed thusfar on the theory. If occurrences of criminal victimizations causally influence changes in routine activities of persons' lives (e.g., decisions to move; decisions to work), then the conceptual basis of opportunity theory must be reconsidered.

The causal model of routine activity would have to be altered from its present undirectional form. This major change would have important methodological ramifications. It is well known, of course, that estimated parameters within a causal system can assume different values in a nonrecursive model as opposed to one that is recursive. Estimation by ordinary least squares, for example, provides unbiased estimates only if the dependent variable is related to the independent variables recursively; similarly, cross-sectional data provide reliable parameter coefficients only when instrumental variables are properly specified a priori (Heise, 1975). Moreover, there are examples in the research literature that show recursive tests can mistakenly indicate an assymmetric causal structure when the actual relationship is reciprocal, or even in a direction opposite of that suggested by a recursive analysis (Thornberry and Christenson, 1984). In short, if feedback hypotheses can not be ruled out, causal models in the routine activity literature are biased due to misspecification.

Cohen and Felson (1979), in an early exposition of the routine activity theory, argue that the location, frequency and distribution of illegal acts are determined to some degree by the spatial and temporal structures of legitimate activities. As the patterns of legal, routine activities change, therefore, so will the patterns of crime. This is an intuitively appealing, unidirectional causal relation that explains the association between lifestyles and the distribution of criminal victimizations. There are theoretical and empirical justifications, however, for suggesting that such a representation of the causal flow between styles of life and victimization is oversimplified.

Social researchers in many disciplines have learned that unidirectional presumptions of causal direction are often unrealistic given the nature of many social phenonomena. In education, for example, it is clear that one can not investigate adequately the relationship between student performance and teacher expectations unless the interrelationships of these two concepts are taken into account (Humphreys and Stubbs, 1977) Similarly, recent research indicates that the association between unemployment and criminal activity is better explained by a model that incorporates a reciprocal causal structure than by one which posits a unidirectional affect. (Thornberry and Christenson, 1984). The assumption here is that the study of crime and lifestyle falls within this category; an appropriate causal model should test explicitly for reciprocal effects.

Sufficient evidence can be found in the literature to warrant a nonrecursive approach in this analysis of the relationship between routine activities and burglary victimization. Residential burglary, though devoid of victim-offender confrontation, is likely to contain a substantial fear component. As raised earlier, the public views burglary as the prototypical residential crime, and those whose homes are burglarized often express strong feelings of psychological intrusion and personal violation. Dubow (1979) suggests that these feelings arise because residents are conscious of the potential the incident had for a confrontation with the offender. Skogan and Maxfield (1981) mention how the loss of treasured, irreplaceable items, or the financial strain imposed by the crime can intensify fear. Other factors undoubtedly act to induce or reinforce such fears. Regardless of the reasons, to the extent that people react to these fears, people might be expected to

change some portion(s) of their daily routines in order to cope with their fear and reduce the perceived chances for a subsequent victimization.

Some research on the fear of crime suggests that individuals react in various ways to their concern. This is reflected by the willingness of people to employ assorted home protective measures (Lavrakas, 1981), as well as in a wide range of other behaviors (see, Skogan and Maxfield, 1981). A different, though related, set of findings sheds additional light in this area. Dubow and Emmons (1981) indicate that successful community crime prevention programs are most often part of multi-issue citizen groups and must compete with other community oriented projects for resources. This is noteworthy because it places crime firmly among, not separate from, other community problems. People apparently react to a fear of crime on a community wide basis for the same reason they mobilize against other problems: they perceive a threat to their environment.

Although indicative of behavioral reactions to a fear of crime, the actual behaviors cited are rather trivial. The fact that people install deadbolt locks or participate in neighborhood watch programs in response to their fear of crime does not permit the inference that fear of crime prompts changes in routine activties or lifestyles. The inference is reasonable only if lifestyle or routines are defined so broadly that they encompass every behavioral aspect of people's lives, no matter how minor or inconsequential. Such extreme generality is not very helpful analytically, however.

Additional reasons exist for suggesting a more substantial impact on lifestyle activities by the fear of crime, however. Fear in

general often elicits avoidance behavior. Fear of crime can, for example, interfere with common social interactions and alter lifestyles (Hartnagel, 1979; Wilson, 1975). In the case of burglary in particular, Dubow (1979) reviews evidence that shows burglary victims sometimes react, because of their fear, to a burglary incident by becoming afraid to stay home alone. The manifestations of such a reaction will differ according to the type of individual, the nature of the crime, and the level of fear, but substantial change in lifestyle activities seems implicit. It is quite plausible that, depending on individual circumstances, a burglary victim might alter work hours or even change jobs in order to be home the same time as at least one other household occupant. Other kinds of activities might also be rearranged or curtailed. Alternatively, individuals who live alone might seek a roommate or begin spending more time in the homes of others. This evidence, though scant, is sufficient to suggest probative value in further exploration of feedback loops in a model of routine activities and burglary victimization.

CHAPTER 4

Data and Methodolody

The conceptual organization of the routine activity theory requires a dataset with specific properties. The data must accommodate the longitudinal character of the household level relationships hypothesized by the theory and provide non-crime information that is sufficient to allow analyses of the routine activities affecting the crime targets' (in this case the residence) exposure and vulnerability to burglary. One of the practical benefits reaped from selecting residential burglary as the crime of interest is that the routines of interest revolve around the home. The national crime sample consists of household addresses with information collected on the characteristics and major activities of all household members. Although the survey does not document behavior at work or elsewhere in public, sufficient details on routine behaviors are available to allow an assessment of the ways particular behaviors affect household vulnerability to burglary. Moreover, the dataset must permit the tracking of changes over time in the structure of those routine activities, since such shifts presumably affect temporal variations in victimization rates. A longitudinal data file constructed from the houselhold-level information collected by NCS can accommodate these needs.

The National Crime Survey

The NCS is a record of personal and property victimizations that includes: rape, robbery, assault, burglary (commerical (until 1977);

residential), larceny (personal and household) and auto theft. Victimization surveys were initiated as an alternative to UCR figures which are system-dependent and able to furnish summary information on most crimes. In contrast, the NCS collects extensive detail about selected crimes by interviewing a sample of households. The use of nationwide victim surveys was first advocated by the 1967 Presidential Commission on Law Enforcement and the Administration of Justice; following pre-tests and pilot studies the survey was implemented in two forms: city samples and a national sample. Though the files share a common history, they have different designs. Since this research analyzes the national data, only the design and structure of that file will be discussed. Detailed treatment of issues peculiar to the city-level sample can be found elsewhere (e.g., Hindelang, 1976; Garofalo and Hindelang, 1977).

Although the national survey began in 1973, the Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan in Ann Arbor, Michigan states that data in the form necessary for this research are available only since 1977 and processing is now complete through 1981. The entire data file maintained by the ICPSR archives consists of approximately 1370 variables arrayed in incident, person, and household files (see ICPSR, 1981 for a complete listing). Of course, much of that file is irrelevant to the present undertaking, so a reduced file was received from ICPSR which will, in turn, be trimmed further to those variables most pertinent to the research task at hand. Before detailing the precise variables subject to analysis, however, some of the more general aspects of the dataset are considered.

Sample and Design

The national sample tape obtained from ICPSR contains approximately 79,963 household units in the sample with about 158,963 people in those homes. Units are selected in a stratified multistage cluster sample. The first sampling stage consists of primary sampling units (PSUs) formed from all counties in the country. The resulting PSUs are then grouped into 220 strata by combining areas which share similar characteristics (e.g., geographic region, population density, nonwhite population). There are 156 remaining strata referred to as self-representing areas that represent single locations that are certain to be a part of the sample. One area is chosen from each of the 220 non-self-representing strata based on a probability proportionate to that area's population.

The other sampling stages insure a self-weighted probability sample of all housing units within each of the selected geographic areas. Under such a procedure, each sample unit has the same initial probability of selection. One thousand-nine hundred-seventy enumeration districts[1] are first chosen proportionately according to population, and segments of clusters containing four households are included in the sample from within the districts. To insure that the sample reflects changes in building patterns, procedures are designed to include housing units built after 1970. A sample is drawn routinely from among permits authorizing new construction. In those areas that do not issue such building permits, area segments are sampled in order to detect recent construction. It is true, of course, that these procedures account for only a small portion of the total sample; however, their contribution increases steadily as the sample develops over time.

There is an analytically relevant problem associated with the NCS's sampling scheme which must be mentioned: statistical theory generally assumes a standard random sample. This assumption is, of course, violated in the national NCS data. Many authors (e.g., Lazerwitz, 1968; Kerlinger, 1973) point out that cluster sampling introduces a sampling error component into the final sample because of variation in the actual size of the final sample, increased variances, and enhanced homogeneity within individual clusters. Traditional statistical tests are likely to yield inaccurate estimates of the standard error and therefore will be misleading. Appropriate adjustments for correcting the biased estimates of standard error are available (Lazerwitz, 1968: p. 301-308).

The entire national sample is structured using a panel design. This feature is especially appropriate for a test of routine activity theory for the two reasons raised earlier. The panel design accommodates tests of the perspective's longitudinal hypotheses and focusses on the individual level since each panel consists of household addresses and the individuals who occupy them. The sample of households is divided into six rotation groups, and following an initial interview, each group is interviewed every six months for a maximum period of three years. Six panels are designated within each rotation group and a different panel is interviewed each month throughout the six months. Initial interviews at a household are known as bounding interviews and are not used to prepare estimates of victimization rates. Rather, the information gathered is used to establish a time reference boundary in order to avoid the duplication of previously reported events. Summaries of the bounded events are given to the interviewers so they are better able to detect

forward telescoping by respondents. The NCS employs a panel rotation scheme in order to replenish the sample as households reach the end of a three year period and exit the sample. Table 1 illustrates how one complete sample is replaced by a second one over three hypothetical interview years. Each sample has six rotation groups and six panels comprise a rotation group. In the body of the table, panel numbers are opposite the months in which they are interviewed, and directly below their rotation group; panel numbers in parentheses denote bounding interviews.

NCS File Composition

The NCS data base consists of three separate records of information. The household file furnishes detail about household characteristics (e.g., income, number of members) and characteristics of the surrounding neighborhood (e.g., population composition, housing patterns) as compiled by Census Bureau in 1970. Information about all household members over the age of twelve is contained in the person record. Demographic details and information about work, schooling, or other major activities are collected from the individual whenever possible or a proxy when a certain individual is unavailable. Lastly, the incident file includes data compiled from reports of property and/or personal victimizations mentioned during the interviews.

The entire file is quite large and contains much information that is not relevant to this research. Consequently, the ICPSR archives were asked to supply a reduced longitudinal file from the household, incident, and person level records. In an effort to facilitate analysis, the file was transformed by ICPSR from its hierarchical pattern to a more conventional rectangular (flat) file. Even after that was completed by

the archive personnel, additional data management and manipulation were necessary. The data arrived separately in two files -- household and incident, and person. Since it is essential that the data be arranged and matched correctly according to household, appropriate household unit, it was necessary to uniquely identify the sample households and sort each file accordingly before merging the separate records. While a household identification number is assigned during the data processing phase by ICPSR, confidentiality requires that those numbers be destroyed. It was necessary to rely on seven control variables (group sample designation, psu, segment number, check digit, serial number, segment type, and household number) generated by the Census Bureau to identify sample units, thereby insuring integrity of the data. By sorting the individual files according to those variables before concatenation, a rectangular file was merged such that the longitudinal information from both files is matched with the correct housing unit.

NCS Data Collection

There are two basic sets of questions asked of respondents by NCS interviewers: the basic screen questionnaire and the crime incident report (sample copies in Appendix A). The first questionnaire (p. 1-4 in Appendix A), in addition to the administrative record it provides, supplies data on household characteristics (Items 1-13b on p. 1 of Basic Screen Questionnaire), information about each member of the household twelve or more years old (Items 14-28e on p. 2 and p. 4 of Basic Screen Questionnaire), and rudimentary information concerning household crimes or victimizations sufferred by individuals living in the home. Preliminary indicatons of possible crimes committed against a household's property or members come from the household and individual screen

questions (Items 29-48). If crimes are uncovered by these screen questions, then a crime incident report is completed (p. 5-8). One such report is completed for each crime incident reported to the interviewer.

There are certain circumstances, however, where several incidents are classified as a series incident on one incident report. This classification is used only as a last resort and only when three conditions are met:

1) The incidents must be of the same type with similar details.

2) There must be a minimum of three incidents in the series.

3) The respondent must not be able to recall dates and other details well enough to report the incidents separately.

Series incidents are problematic for several reasons (see, Hindelang, 1976; Hindelang and Garofalo, 1977). They will be excluded from analysis in this research primarily because they represent a rather small portion of the victimizations considered. Of the 39,591 household property crimes reported by the respondents in this sample, only 1,218 (3.1 percent) are recorded as series incidents. (The breakdown for residential burglaries is not yet known). Even if we consider that each of those actually represents a minimum of three crimes, series incidents would still account for less than 10 percent of the incidents in the sample. Considering that no satisfactory way has yet been devised to overcome the analytic difficulties presented by series incidents (Garofalo and Hindelang, 1977), their inclusion seems unwise as well as unnecessary.

The interviewing practices followed by NCS field workers are quite well established and well documented (see, U.S. Bureau of the

Census, 1975). Before an interviewer calls on a sample household, a letter is sent to the occupants informing them of the survey and explaining that an interviewer will contact them shortly. As soon as possible after the initial contact by mail, an interviewer visits the home and interviews as many of the occupants as possible. Questions pertaining to the household as a whole are asked once of a household respondent who could reasonably be expected to provide informed answers. These respondents are also asked to furnish individual information for the members of their households who are 12 and 13 years old. All other people in the household are asked the individual screen questions directly. Every attempt is made to minimize the number of non-interviews. Of couse, some missing interviews (e.g., unoccupied units) are unavoidable. But in those instances in which data can not be gathered because certain individuals are not home, return visits are scheduled for more convenient times. Return visits are also made to those units where no one was home initially or the occupants were uncooperative.

Interviewers receive extensive training and the Census Bureau maintains quality control checks through direct observation of the field workers. The accuracy of completed interviews is verified by reinterviewing a sample of household units and comparing the two sets of answers. Graham (1976a, 1976b) reports that quality checks generally show that interviewers follow the established field procedures and little inconsistency is found when the two sets of responses are analyzed. Moreover, there are additional efforts to assure a high degree of quality and consistency. Garofalo and Hindelang (1977) explain that the centralized data processing involves a clerical edit of all materials

submitted from the field. As the data are transferred to a machine readable format, all the work of operators is verified until an acceptable degree of proficiency is achieved. Subsequent checks are then continued periodically. Once the data are compiled, computer editing tests for internal consistency. Errors found through this process are checked and appropriate corrections are made. Discrepancies which remain unresolved are coded as missing values.

NCS Methodological Issues

Beyond the internal checks and experimental assessments of NCS accuracy, there are other methodological issues that deserve attention. Although the victimization data were generally welcomed as an alternative measure of crime, a few warned the research community not to view the figures uncritically or as a panacea. Levine (1976), for example, points out that incentives for overreporting may exist in the NCS; moreover, he seems to reflect a basic distrust of exclusive reliance on observational/self-report data of any kind. Consequently, he argues that multiple indicators of crime levels and patterns should be used rather than one type of data. Although his advice might seem prudent in abstract terms, it probably cannot be realized in practical settings. Research that specifically investigates the comparability of different measures of crime (e.g., Hindelang, 1974; Hindelang, 1977; Hirschi, et al., 1981) shows consistently that UCRs, victimization surveys, and self-report questionnaires each supplies valid indications of criminality within the behavioral domain each measure taps. All three are to some degree imperfect and are not universally interchangeable. The

appropriate point is not which measure is better or that no measure is adequate; the question is which data are best suited to address the research question(s) under investigation.

Given that the NCS's national sample is the most appropriate data for testing the routine activity theory, there are certain methodological background issues which are relevant. Before nationwide interviewing for the NCS commenced in 1972, the Census Bureau conducted numerous tests to evaluate and refine the proposed procedures. As a result, significant methodological problems were examined which bear on the survey's reliabilty and validity.

One of the first issues identified in the development of NCS was the ability of respondents to remember incidents (Ennis, 1967). It was presumed that variation in this regard would depend, in part, on the length of a reference period over which a respondent would be asked to recall. Reverse record checks were used to determine the length of time which would produce the most reliable data. In their summary of the results from three pilot projects (Washington, D.C., Baltimore and San Jose), Garofalo and Hindelang (1977) report that for simply determining whether a victimization occurred, there is no appreciable difference between a six and twelve-month reference period. However, if we are concerned about victims recalling accurately the quarter in which the incident took place (an important characteristic for reliable panel data), a shorter time period is dramatically superior. The six-month period was adopted by the NCS.

Studies utilizing the reverse record checks also addressed other methodological questions that are pertinent to this analysis of the national sample. Telescoping refers to phenomena of memory in which

respondents mistake the time of victimizations. Forward telescoping is one kind of memory defect that involves respondents who report victimizations as taking place during the six-month reference period when the crime actually occurred before the reference period. This can obviously inflate victimization estimates. The Census Bureau instituted bounding to conteract the effects of telescoping on the accuracy of the data. Bounding is a strategy whereby information collected in the first interview of a household is not used as part of the dataset. Instead, the results of bounding interviews are used as tools to reduce bias that is introduced by forward telescoping. By comparing a summary of the victimizations recalled during the bounding interview with those crimes reported when the household is recontacted, interviewers are able to detect crimes which occurred prior to the reference period. Comparisons of the victimization rates obtained with and without bounding demonstrate that unbounded estimates are far greater than those recorded when bounding is used. Tables 3 and 4 constructed by Garofalo and Hindelang (1977, p. 28) show that the differences in rates are statistically significant for both personal crimes (completed and attempted rapes, robberies, and assaults) and crimes against property (completed and attempted burglaries, robberies, and auto thefts). Bounding clearly reduces the inflation of victimization that results from forward telescoping.

A second type of telescoping which potentially affects responses on the NCS is internal forward telescoping. This occurs when a respondent reports a victimization as occurring more recently in the reference period than it did in actuality. Evidence of internal telescoping in the national sample is inferred from Ennis's (1967)

results showing a tendency for reported victimizations to cluster in those months of the reference period closest to the month of the interview (Garofalo and Hindelang, 1977). The problem here is slightly different than with forward telescoping. Internal telescoping mistakes the month in which a particular victimization incident occurs, not the placing of an incident in the correct reference period. Since this research focusses on the effects changes in routines at time one have on victimization probabilities six months hence, the precise month of occurrence is not necessary. It is sufficient to know whether the household suffered a burglary victimization in a given reference period.

Another difficulty involves the degree of trust one can place in respondents' answers. Reverse record checks allow researchers to determine what proportion of victimizations known to the police are actually reported to NCS interviewers. The findings in the three pilot project cities show that responses for all crimes tested (assault, robbery, rape, burglary, and larceny) are quite good; they are particularly encouraging for burglaries. Table 1, constructed by Garofalo and Hindelang (1977), shows that the percentage of burglary victims known to police who reported the crime in the victimization surveys was 88 percent in Washington, 85 percent in Baltimore, and 90 percent in San Jose.

Another issue of importance is the question of panel bias. There are two forms of panel bias which can lead potentially to analytic complications that are pertinent to this research. Panel bias refers generally to analytic and interpretive complications that arise from the panel design. By definition, persons in panel samples remain members of the sample sufficiently long for data to be collected at more than one

point in time. Repeated contacts by researchers that intrude upon the privacy and time of those in the sample introduce the possibility that respondents will tire of their involvement in the study. This motivational fatigue might prompt some in the sample to seek ways of alleviating the inconvience that comes from repeated inquiries by social researchers. To the extent this type of adaptation influences respondent participation or, assuming continued participation, the answers that respondents furnish, the data are biased.

A second complication attributable to the panel format is censored data. The rotation of panels in and out of the sample results in artificial time constraints, imposed on both ends of the time span over which the data are collected. Panel members exiting the sample for some reason (e.g., relocation to new home) are not tracked after leaving the sample, thereby resulting in the precipitous censoring of data. In addition, the panel rotation scheme censors data on both the right and left sides of the sample's time line; that is, information is terminated on rotation group panels that leave at the end of the three-year period (right-hand censoring).

The difficulties presented by panel bias affect the design and conduct of this research to different degrees and require explicit consideration. They will be discussed in the following sections, beginning with response bias precipitated by loss of respondent motivation and the resulting panel attrition.

Motivational Fatigue in the NCS Crime Panel

The members of each household may be interviewed up to seven times over three and one half years; the bounding interview followed by one interview every six months for three years. This lengthy period,

along with the length of typical interviews and the correspondence or rescheduling efforts that might be necessary, provide ample reasons for people to tire of their involvement in the survey. Such motivational fatigue can become manifest in two ways. Members of households might refuse to cooperate altogether by not answering even the basic screen questions, or they could become less willing to report victimizations since a positive response to that screen question triggers the lengthy critical incident report. Garofalo and Hindelang (1977) cite two studies which address these issues. Woltman and Bushery (1975) report that noninterview rates increase with the length of time a household is in the sample; but the effects are too slight to suggest systematic bias. It appears that respondents in the panel sample do not regularly choose to opt out of the survey because of the length of time they must remain in the sample.

This does not necessarily imply, of course, that the panel design is not introducing bias; respondent fatigue could result in lower reporting rates. Woltman and Bushery (1977) investigate this question by comparing victimization rates of respondents interviewed for the second time with those interviewed the third time; third-time respondents with those interviewed for the fourth time, and so forth. They state that victimization rates decline steadily with the length of time respondents are in the sample. However, the only statistically significant difference is found between the respondents interviewed for the second time and those for the third time. Although respondents' productivity drops the longer they are in the sample, these results do not suggest widespread effects across the sample period.

Censoring of Panel Data

The results of previous research suggesting panel attrition may not be an extensive problem do not imply that researchers can proceed with analyses unconcerned about potential bias. Nearly all analytic models assume that right-hand censoring is independent of the occurrence of events; that is, sample units are not lost selectively because of their increased or decreased likelihood of experiencing the event of interest (Allison, 1982). Although this is a necessary assumption, it may not always be realistic. Indications of an inverse (though generally insignificant) association between length of time in an NCS panel and respondents' reporting rates necessitate some attention.

A straight forward way for assessing whether victimizations influence panel attrition is with a control group comparison. The data permit a comparison between households that leave the sample following a victimization and those that are lost from the sample without a preceding victimization. If a significant effect of a victimization event upon mortality is detected in the sample, analyses and conclusions can be adjusted accordingly.

Left-hand censoring of the data is an altogether different problem. This refers generically to the lack of information on the history of members in replacement panels. When households enter the sample bounded in the first interview, nothing is known about their victimization history prior to their inclusion in the sample. Research suggests that personal, household, and ecological characteristics interact so as to cluster the risks of household victimizations. For example, the NCS city sample for 1972 to 1974 shows that the likelihood for each type of household victimization is considerably greater for

those households that experience another household crime (Hindelang, et al., 1978). Whatever the nature and shape of the factors that account for this type of victim-proneness, bias is introduced to the extent that these characteristics affect victimization(s) reported initially by new sample members.

One aspect of this project's design is intended to neutralize the effects of left-side censoring. This research concentrates on the causal relations between burglary victimizations and lifestyle characteristics of household members. By analyzing victimization events that occur after some change in lifestyle, a starting point for the analysis is defined which does not arbitrarily truncate the data. This approach is justified theoretically because the main thesis of routine activity is that changes in lifestyle patterns influence the opportunities for certain crimes. This design is similarly applicable to an assessment of reciprocal causation. The starting point for a consideration of how victimization(s) affect lifestyle (e.g., moving) is defined by the occurrence of a victimization event.

This approach to counteracting this type of bias is also well grounded methodologically. Parameter estimates are affected adversely by censoring from the left because there is no substantively meaningful event which accounts for the entry of units into the sample (Allison, 1982). Since the focus here is the analysis of victimizations that occur after some change in daily routines, the starting point is meaningful theoretically.

Panel Data Available for Analysis

It is unfortunate, though not surprising, that a panel sample for all the years that victimization surveys have been conducted is not

currently available for analysis. Practical and administrative factors combined to limit the number of waves of data to four, and the period of years those waves cover begins with the third quarter of 1977 and ends after the second quarter of 1981. The ICPSR Archives have an on-going program continually making more data available on public access tapes for researchers. At the time this request for the NCS crime panel was made, processing had been completed through the second quarter of 1981. Archive personnel also explained that the process of providing access to the NCS panel began with the mid-1977 data. Any attempt at the time of this reseacher's request (July 1984) to retrieve data from earlier years would have been both costly and time-consuming.

Similarly, the number of waves in which the data are arrayed is also the result of practical limitations. The maximum number of waves for a given household is six, excluding the bounding interview. ICPSR staff explained that the hierarchical structure of the dataset facilitates subsetting of individual files (household, person, and incident), but matching information across files by waves is considerably more cumbersome. Data pertaining to specific waves are distributed throughout the files and must be extracted one wave at a time. ICPSR requested that the number of waves necessary for the study be specified along with the variables of interest. Four waves were decided upon in an effort to balance time and cost constraints with design and analytic concerns.

The NCS sample of victimizations to be analyzed is the best available data source for investigating the dynamics associated with the relations between routine activities and residential burglary. Powerful assessments of the causal relations postulated in Cohen et al.'s work

require an analytic strategy that produces reliable estimates in light of the expected intercorrelations (i.e., reciprocal causation) and the inherent problems (e.g., autocorrelation) associated with detecting and analyzing change over time. The discussion now turns to the NCS variables availabe for analysis and the fundamental analytic strategy.

Analytic Plan

Major Hypotheses

Besides the assumptions and definitions discussed in Chapter 3, several routine activity hypotheses applicable to residential burglary guide this research. It is probably worth restating the theory's major thesis since it guides the approach this research takes. Cohen and Cantor (1980) explain that the probability of motivated offender(s), suitable targets(s), and capable guardians(s) converging in time and space is increased or decreased as a function of variations in the daily activities of individuals.

Within the routine activity framework, Cohen, Kleugal, and Land (1981) present several multivariate relationships that are relevant to this research:

> Income has opposing effects on burglary victimizations. Increases lead to lower risk through exposure, guardianship, and proximity; but also lead to increased target attractiveness and a higher risk.
>
> Age is inversely related to risk because of lifestyle.
>
> Nonwhites have higher risks of burglary due to proximity.
>
> Holding lifestyle and proximity constant, income has a direct effect on burglary victimization.
>
> Holding lifestyle, proximity, and income constant, race and age have no direct effects on risk of victimization.

Cohen and Cantor (1980) give the general hypothesis derived from these considerations as: the greater the proportion of routine activities centered near the home, the lower the risk of burglary victimization.

Opportunities for residential burglaries vary according to four risk factors (exposure, guardianship, proximity, and target attractiveness). The interplay of these factors influences whether the three minimal components of victimization will intersect at a particular time and place. Various daily routines that individuals follow have different consequences for the exposure, guardianship, proximity, and attractiveness attributed to a target. This in turn results in different victimization rates. It follows, then, that temporal changes in the daily routines will result in longitudinal fluctuations of the interaction among the risk factors. This will, to the extent that the theory can be confirmed, account for differences in victimization over time. Variables that record changes in relevant routines are therefore necessary.

Before reviewing those variables available in the NCS, a few general comments are in order. The variables are displayed in Tables 2-4 and are sometimes discussed individually. All statements concerning bivariate relationships and descriptions of the influence a variable presumably exerts on certain risk factors should be read with the statement "all else being equal" implied. In addition, it is apparent that some of the variables are redundant. They are included as safeguards. Complications such as missing data can obviate the use of certain variables and alternative indicators might be necessary. Moreover, all variables measuring some aspect of a phenomenon do not necessarily perform well empirically and judgments must be made after

analysis about the use of particular variables. This was the situation faced by Cohen and Cantor (1981) when their major activity variable did not function nearly as well as age when they were used as measures of activities away from home. Theoretical and empirical considerations persuaded the authors to rely on age in that case.

The emphasis throughout has been on measuring change in the routines and characteristics of households and their occupants that translate into enhanced or reduced opportunities for residential burglary. In light of Cohen and Cantor's hypothesis on activity around the home, the term change has a specific meaning. It refers specifically to changes that suggest a shift in the locus of that activity. Relative dispersion over time of activity away from the household will presumably affect an increase in the risk residential burglary, while changes that result in a greater concentration of activity around the home result in a lower risk of victimization (Cohen and Felson, 1981).

Variables Available for Analysis

Several variables in the NCS permit a longitudinal assessment of how changes in routine activities around the home influence opportunities for burglary victimization. Data on the household and information on some routines of household occupants will provide specific insight into how changes in household routines and characteristics affect (over time) dwelling exposure, its state of guardianship, and its attractiveness as a burglary target. Before discussion of the household variables contained in each of the four waves, a comment is in order about some neighborhood characteristics contained in the dataset.

The NCS collects neighborhood characteristics summary data describing neighborhoods of household addresses contained in the panels.

For purposes of the survey, neighborhoods are not identified, but represent various types of areas populated by approximately 4,000 people. These data are taken from the 1970 Census on populations and their housing. Because of this, the neighborhood information does not vary across the sample's time period. One partial set of these variables from the first wave is contained in the data and will prove useful.

Many of these variables provide neighborhood measures of structural effects hypothesized as important by the theory (see Table 2). Variable 1044 is an indicator appropriate for exploring the theorem that a"... decrease [population] ... in physical locations that are sites of primary group routine activities ... produces an increase in ... [opportunities for] ... property crime violations" (Cohen, Felson, and Land, 1980, p. 99). This variable may also supplement variables 1050, 1051, 1075, and 1086 in an effort to address a point first raised by Reppetto (1974) when he observed that neighborhoods with the lowest burglary rates tend to be those with a strong territorial identification, such as that found in areas with high ethnic concentrations. Cohen and Cantor (1981) expand this slightly and propose that one key to a reduction of burglary may be the tighter social organization of neighborhoods which translates into a greater degree of guardianship.

Although they maintain that their analysis supports this proposition indirectly, it is unclear how they reach that conclusion when their variables include income, age, race, and major activity of the households' head, and the type of area (central city, other). These five neighborhood variables provide an opportunity to explore this area more fully by examining differences in burglary rates among neighborhoods with indications of varying degrees of social cohesion. For example, an area

with a predominantly Hispanic population that owns their homes might be expected (all else equal) to have a lower burglary rate than a neighborhood with a heterogeneous population living in rental property.

The income variables (1069-1071) and the poverty measure (1074) pertain to the consistent finding that burglary is distributed parabolically according to income. Neighborhoods at the low and high sides of an income scale would be expected to have similar rates of burglary, with both higher than the middle income groups. Variable 1072 relates to the argument that social and income inequality influences victimization rates independently of lifestyle considerations because of differential access to social resources (Cohen, Kleugal, and Land, 1981). Variable 1054 is the population age classification used in the NCS that is closest to the offense-prone age. Neighborhoods with high concentrations of youths might be expected to suffer higher burglary rates than areas with an older population.

The specific effects of these particular neighborhood features can not be analyzed longitudinally, since the 1970 values are static across sample years. However, cross-sectional comparisons among neighborhoods can supply conformation or refutation of some of the previous research. Moreover, their inclusion in a routine activity causal model could furnish insight into how these characteristics interact with household routines to influence burglary victimizations.

Incident and Household Variables. Variables from the household, person, and incident file are arrayed in panel form. These comprise the core of information on which the proposed analyses will concentrate. The number of persons that occupy dwellings will of course vary rather widely among households, as will the number of victimizations. Although the NCS

collects personal information on all residents, and records every victimization reported to the interviewer, practical considerations necessitated that only households below a certain number of occupants and incidents be included in the final sample. Descriptive frequencies and discussions with ICPSR Archive staff let to the decision that households with a maximum of five occupants or four victimizations per wave would be part of the final sample.

Table 3 lists household characteristics compiled by the NCS that are useful in a longitudinal test of routine activity theory. Variable 1010 is an important indicator in two respects. It is a household sequence number that records whether people interviewed at one time (e.g., Wave #2) are the same as those interviewed the previous time (Wave #1). This enables the researcher to know when members of a household change, thereby ensuring that individuals and households are matched correctly over time. In addition, this variable together with 1022 and 1024 provide measures of household stability. The frequency of moving associated with a household is a good way to assess reciprocal hypotheses. If residential moving is associated with victimization, then crime's effect on changes in lifestyle are better understood, and changes that may occur in a routine activity model of burglary (because of estimation with feedback loops in the causal scheme) will enlighten our understanding of the theory.

Variables 1030 and 1031 furnish measures of household size. Although not a variable which other studies have considered, it seems reasonable that the number of people occupying a house will influence guardianship and exposure of the property. For example, large households would be better guarded than small ones by virtue of a greater

probability that someone will be home at a given time. Similarly, large numbers of occupants suggest implicitly a greater likelihood that some routine activities will take place around the residence. Family income (1034) is consistently found to be a significant predictor or burglary (Chapter 3) and is included as a measure of target attractiveness. Increases and decreases in income over the sample period, with the changes they imply for attractiveness, should be important for the test of routine activity theory.

Variables 1096 through 3195 in Table 3 apply to the head of a particular household. In addition to basic demographics, certain of these variables are expected to convey pertinent information about the structure of activities around the home. Age (1096) as Cohen and Cantor (1981) report, has strong implications for property exposure. Older residents tend to spend more time at home than do young people. Since burglars prefer unattended property, homes occupied by older people are likely to be less vulnerable to burglary than houses of the young. Changes in marital status (1097) are likely to affect opportunities for burglary as well. Households with one-person heads will, depending on other factors, present greater opportunities for burglary than those with heads who are married or cohabitating with another adult. Consideration of marital status in conjunction with other variables present some unique possibilities for testing the theory. For example, if a married person who did not work previously takes a job (variable 1103), the decrease in time spent near the home and the increased income have direct implications for the property's state of guardedness and its attractiveness. Other combinations of change among these variables can

of course be evident in the data. The point to be emphasized is that they represent useful indicators for assessing the impact of lifestyle changes on burglary victimization.

The last five variables in Table 3 (3191-3195) are taken from information solicited from victims as part of the incident questionnaire. Since the head of a household is defined by NCS as the victim of a residential burglary, they are included here with other data on household heads. Work-related behavior is an important determinent of the routines most people follow. Changes in a household head's work patterns are likely to influence victimization. Perhaps the most unique aspect of the dataset employed in this research is the inclusion of detailed information on individuals who share housing. Table 4 lists the variables available for those who occupy a household (a maximum of five for each unit). Besides the personal attributes these items reflect (2007-2013, 2034), data are provided that document work behavior (2020-2033, 2035) and classify other major activities (2018). Such information present the opportunity to research the texture of household related behavior in detail. Relatively subtle changes that affect the frequency of behavior around the house are indicated and their effect on burglary victimization over time can be assessed.

Panel Methods

The analysis is made possible by recent advances in statistical panel methods (Kessler and Greenberg, 1981; Joreskog and Sorbom, 1981). A minimal panel model, functional form not withstanding, is

$$B_t = a_1 B_{b-1} + a_2 A_t + a_3 Z + u_t \quad (1)$$

where B_t is burglary victimization in the tth year, A_t is some routine activity (work or leisure behavior, homeownership, etc.), Z is some static exogenous variable (neighborhood characteristics, e.g.), and u_t is an error term. Since victimization may affect some, but certainly not all, activities (feedback loops apply here), the minimal model would be expanded to:

$$A_t = a_4 A_{t-1} + a_5 B_t + A_6 Z + v_t \quad (2)$$

Exogenous instruments sufficient to identify the model are available.

The emphasis in the panel analysis to be undertaken is on change over time. Such change is crucial if we are to infer the causal relations set forth by the theory. There are, of course, several analytic techniques appropriate for analyzing causal associations. Prominent examples include cross-sectional analysis, trend studies, time series, and continuous time series. While serious questions exist regarding the efficiency of the first, trend studies are best suited for assessing change in one variable, and continuous time series methods have limited application in social science research (Kessler and Greenberg, 1981). Although similarities exist between panel analysis and time series, the former is best suited given the nature of the data. More than two waves of data is generally considered fortuitous for panel methods, while measurements taken at four points in time comprise an inadequate design for time series analysis (see, Markus, 1979). A panel

study collects repeated observations on a number of sample units at two or more points in time, thereby furnishing cross-sectional as well as temporal information.

To a cetain extent, the panel analysis will be empirical. Theory is not strong enough to specify the lags in equation (2). Some models address this issue (e.g., Balkin, 1979; Balkin and McDonald, 1981), but Cohen and his associates, as discussed previously, ignore this significant issue. The results could point the way toward modification of the theory and augment existing knowledge of the relationship between routine activities and crime. The larger task is confirmatory, however. The panel model is interpreted as any structural equation model and, except for differences in estimation (in this instance, full information maximum likelihood), it is subject to the same limitations. By incorporating lagged endogenous variables into equations (1) and (2), the model explicitly accounts for structured change (that is, change that can be predicted from initial scores); omitted variables are implicitly represented; and regression artifacts are controlled (Kessler and Greenberg, 1981: Chapters 3 and 4). But the most rigorous test of routine activity hypotheses concerns the longitudinal stability of structural effects. The effects of activities on victimization (and vice versa) are expected to be equal across the 1977-1981 study period. The theory is viable to the extent that its structural effects are stable.

The multiwave (four) design of this particular panel study presents additional advantages for this particular theoretical test. As Heise (1969) states, the inability to distinguish between measurement error and instability (change) in a two-wave model make it difficult at best to study the exact nature of causal dynamics operating within that

system. Furthermore, two-wave designs can be identified only if both cross-lagged and contemporaneous effects can be estimated by fixing their values (Kessler and Greenberg, 1981). Otherwise the model is underidentified and its parameters cannot be estimated. However, it is possible to identify a model consisting of three or more waves by imposing consistency constraints on the parameters. [Detailed discussions along with algebraic representations are found in Greenberg, Kessler, and Logan (1979) and in Kessler and Greenberg (1981: p. 33-46)]. Considered generally, such constraints involve the assumption that certain structural effects are constant between the first and last waves. This is certainly a much weaker assumption than fixing specified values in order to reduce the number of parameters that must be estimated. In that way it is possible to identify the model under consideration. Stated substantively in terms of a routine activity model, one would expect the effects of daily activities on victmization (and vice versa) to be equal across the 1977-1981 period.

Besides their increased complexity, structural equation models present special estimation problems. The choice of an estimation procedure, of course, depends on the data being analyzed and the model being estimated. The routine activity model under consideration involves a discrete dependent variable (victimization/non-victimization) which requires special consideration. In such cases, Hanusheck and Jackson (1977) explain,

> ... we are interested in choice behavior or the occurrence/non-occurrence of a particular event. When this is the case, we are not interested in estimating the value or numerical size of the

> dependent variable. Instead, we are interested in analyzing the underlying probability of a given event or choice; more specifically, how a series of exogenous variables influences the underlying probabilty (p. 215).

Stated another way, it is not the probabilities themselves which are of interest, but whether or not a specific event takes place under various circumstances. Problems are exacerbated in cases, such as this, where the model contains jointly dependent variables and error terms are correlated with the endogenous variables. Since these conditions produce biased and inconsistent results, alternative procedures such as maximum likelihood are generally recommended (Hanushek and Jackson, 1977; Draper and Smith, 1981). The maximum likelihood technique for estimation involves choosing the underlying parameters of a given distribution that maximize the observed results. By relying on estimates of the known distribution, parameter values are selected that would give the highest probability of obtaining that particular outcome. Statistically, according to Draper and Smith (1981), maximizing this likelihood is the same as minimizing the sum of absolute errors. This is in contrast to least squares which seeks to minimize the sum of squares of errors. Joreskog and Sorbom (1981) state that the maximum likelhood principle is based on the assumption that the observed variables display a multinormal distribution, thereby becoming most precise in large samples.

Panel Model Estimation

There are various techniques available for computing the parameters contained in a causal panel model. Two complementary procedures will be employed in this research. The first is log linear analysis. It is an approach that is well suited to the study of categorical variables and is often suggested as a procedure for analyzing

panel data and estimating causal parameters (Markus, 1979). There are two major approaches to the log linear analysis of cross tabulated data. One is the general model that does not distinguish between independent and dependant variables in the exploration of mutual associations among variables. The second, a special case of the first, is the logit model in which a dependent variable is designated. The first model analyzes expected cell frequencies as a function of all the variables whereas the latter dissects the expected odds as a function of the other independent variables (Knoke and Burke, 1980). Since this research has a clear dependent variable, the logit model is applicable.

The focus of the log linear (logit) analysis is on direct effects exerted by the independent variables and on interactions among them. Other research (e.g., Cohen and Cantor, 1981) uses this technique because it permits the multivariate capability of analyzing simultaneously the effects of lifestyle and demographic variables on victimization. In fact logit models involving categorical variables are frequently described as analogs to linear regression models employing continuous data (Bishop, Fienberg, and Holland, 1975; Knoke and Burke, 1980). The analytic logic that underlies this approach will be informative.

One typical way of proceeding with a log odds analysis is to begin with a full or saturated model. This is a model of the data that contains the same number of effects as the degrees of freedom contained in the cross-classified table. Theoretical or empirical considerations could lead the researcher to conclude that particular terms in the model represent insignificant or trivial effects. Under such conditions, the appropriate term(s) are dropped from the model and the new model is

estimated. The odds resulting from the revised calculations will likely differ from the odds associated with the saturated model. A standard chi square test can then be used to test for significant differences in the effect parameters generated by each model. If the difference is insignificant, that term may be excluded from consideration. This sequential procedure continues until as parsimonious a model as possible is developed without sacrificing goodness of fit to the data. The extension of this general analytic strategy to the analysis of change over time in a panel sample is detailed by Bishop, et al. (1975: Chapter 7) and by Knoke and Burke (1980: p. 49-53).

Log linear analysis, like all statistical techniques, has its shortcomings and limitations. Of the limitations raised in the professional literature, the one which is most problematic for this project is the relative inability of log linear models to deal adequately with the adverse consequences of measurement error. Markus (1979) acknowledges this difficulty and covers two methods developed as potential tools for copying with its effects. After reviewing each adjustment procedure, he concludes that the use of one is unwieldly and hindered considerably by the lack of some measure for goodness of fit. The other technique is useful, according to Markus, only under rather restrictive circumstances. Fortunately, an alternative is available.

LISREL (Linear Structural Relations) is a computer program, currently available in its sixth version, which was developed by Karl Joreskog for estimating the parameters of causal models which are confounded by measurement error. Joreskog and Sorbom (1981) explain that, in its general form, the LISREL model consists of a measurement model and a structural equation model. The former describes how

hypothetical constructs are measured in terms of the measured variables and the latter specifies the causal model. The parameters are estimated by employing a full information, maximum likelihood approach to the analysis of relationships represented in the structural equations. The procedure enables the researcher to fit the theoretical model to the data and then test relevant hypothesis via a chi-square statistic that is generated. The LISREL estimates are able to accommodate correlated error and interdependence among variables. This is particularly important given our longitudinal panel sample and the presumed reciprocity expected between victimization and some lifestyle variables. LISREL estimates the correlations within the context of the entire model and adjusts the parameter estimates in light of the covariation.

Research Contribution

The combination of the unique dataset and analytic strategy outlined permit a crucial test of the routine activity theory which has heretofore not been conducted. The theory represents a significant development in the study of opportunity structures that influence criminal victimization. Most assessments of routine activity theory have either been flawed seriously (e.g., macro-level indicators or misspecified models) or only suggestive of the perspective's applicability. This research is designed to overcome past shortcomings by specifically testing the longitudinal, incident-level model set forth by the theory and, perhaps, suggest new directions for development of the theory and criminal/opportunity research in general.

The focus of this research is clearly theoretical. That is, the purpose is to provide a crucial, longitudinal test of a criminological theory that purports to break new ground in the scientific study of

crime. Results from this test will furnish an original contribution to the development of routine activity theory because the questions this project pursues have been overlooked in the professional literature. The results of this research might suggest alterations to the perspective and will also advance the theoretical understanding of crime in general.

This is not meant to ignore potential policy implications that flow from the theory. The routine activity theory characterizes crime as a natural consequence of ecological change so the results of this research will enlighten the predictive utility of the theory. If longitudinal hypotheses are supported, then the structural effects associated with the theory's hypotheses will be accepted as part of the theory. The results can undoubtedly influence future attempts to forecast crime and this may be seen as a definite policy benefit.

The operational consequences of this research go beyond forecasting, however. The routine activity theory points directly toward aspects of crime prevention policies that are not ordinarily considered by criminal justice agencies. Housing and employment patterns, for example, usually play no role in criminal justice policy. The routine activity perspective deals explicitly with these policy areas for crime prevention planning. Systematic inquiry into the precise nature of the relationship between these factors and crime trends will also enhance certain police practices. For example, knowledge of changes in a community's housing patterns would permit more informed decisions regarding personnel deployment. Also, efforts to design and organize community crime prevention efforts could be augmented significantly by knowledge of how routine activities in that community affect crime rates and patterns.

Notes

1. Enumeration districts are defined as small geographic areas with well-defined boundaries established for the 1970 census that contain 250 households spread throughout a PSU.

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APPENDIX A

TABLES

Table 1

NCS Rotation Group Structure

Interview Month (Rotation Group)	First Sample 1	2	3	4	5	6	Second Sample 1	2	3	4	5	6
Jan.	1	1	1	1	1	1	(1)					
Feb.	2	2	2	2	2	2	(2)					
March	3	3	3	3	3	3	(3)					
April	4	4	4	4	4	4	(4)					
May	5	5	5	5	5	5	(5)					
June	6	6	6	6	6	6	(6)					
July		1	1	1	1	1	1	(1)				
August		2	2	2	2	2	2	(2)				
Sept.		3	3	3	3	3	3	(3)				
Oct.		4	4	4	4	4	4	(4)				
Nov.		5	5	5	5	5	5	(5)				
Dec.		6	6	6	6	6	6	(6)				
Jan.			1	1	1	1	1	1	(1)			
Feb.			2	2	2	2	2	2	(2)			
March			3	3	3	3	3	3	(3)			
April			4	4	4	4	4	4	(4)			
May			5	5	5	5	5	5	(5)			
June			6	6	6	6	6	6	(6)			
July				1	1	1	1	1	1	(1)		
Aug.				2	2	2	2	2	2	(2)		
Sept.				3	3	3	3	3	3	(3)		
Oct.				4	4	4	4	4	4	(4)		
Nov.				5	5	5	5	5	5	(5)		
Dec.				6	6	6	6	6	6	(6)		
Jan.					1	1	1	1	1	1	(1)	
Feb.					2	2	2	2	2	2	(2)	
March					3	3	3	3	3	3	(3)	
April					4	4	4	4	4	4	(4)	
May					5	5	5	5	5	5	(5)	
June					6	6	6	6	6	6	(6)	
July						1	1	1	1	1	1	(1)
Aug.						2	2	2	2	2	2	(2)
Sept.						3	3	3	3	3	3	(3)
Oct.						4	4	4	4	4	4	(4)
Nov.						5	5	5	5	5	5	(5)
Dec.						6	6	6	6	6	6	(6)

Panel members are shown in rows directly below their rotation group. The panel members enclosed in parentheses indicate the bounded interview.

Source: ICPSR, 1981

Table 2

Static Neighborhood Characteristics from National Crime Survey

Variable Number[a]	Variable Name
1011	Land Use
1012	Place Size
1013	Place Description
1025	Living Quarters
1044	Primary Individuals/Total Households
1050	Blacks/Total Population
1051	Spanish/Total Population
1054	Population 16-21 Years Old/Total Population
1069	Families Below $5000 Income/Total Population
1070	Families Above $14,999 Income/Total Population
1071	Median Income
1072	GINI Coefficient
1074	Population Below Poverty/Total Population
1075	Owner Occupied Housing/Total Occupied Housing
1086	Vacant Housing Units/Total Housing Units

[a]Variable number is the one used in the NCS codebook (ICPSR, 1981). The codebook also furnishes all details regarding the definitions and codes used for each variable.

Table 3

Longitudinal NCS Variables on Household Characteristics

Variable Number	Variable Name
1010	Household Number
1022	Household Status
1024	Tenure (owned, rented)
1030	Members 12 Years or Older
1031	Members Under 12 Years Old
1034	Family Income
[The following apply to the household's head]	
1096	Age
1097	Marital Status
1098	Race
1099	Sex
1100	Education
1101	Grade Completed
1102	Ethnicity
1103	Employment Status
3191	Employed at Time of Indcident
3192	Type of Job
3193	Occupation
3194	Industry
3195	Employee Class

Table 4

Longitudinal NCS Variables on Household Occupants

Variable Number	Variable Name
2007	Relation to Head
2008	Age
2009	Marital Status
2010	Race
2011	Sex
2013	Highest Grade Attended
2018	Major Activity
2020	Temporarily Absent from Job
2021	Looking for Work
2022	Could Not Take Job
2023	Never Worked
2026	Occupation
2033	Worked Last Week
2034	Ethnicity
2035	Employment Status