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An examination of the associations between the locations of probationers and crimes: A city block-level analysis

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AN EXAMINATION OF THE ASSOCIATIONS BETWEEN THE LOCATIONS OF PROBATIONERS AND CRIMES: A CITY BLOCK-LEVEL ANALYSIS

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THESIS ACCEPTANCE

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A City Block-Level Analysis

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Advisor: Dr. Dennis W. Roncek

This research will use adult probation data from the Douglas County Court Probation Office for 2000 and 2001 to evaluate the relationship between the locations of probationers and their possible effects on the amount of crime on residential city blocks in Omaha, Nebraska. The analyses will relate the probation data to the dependent variables that are based on the Part I Index Crimes obtained from the Omaha Police Department. The research will attempt to evaluate the effects of probationers on the amount of crime on city blocks and compare this with the effects of block-level characteristics and crime on the locations of probationers. This comparison involves using strategies related to Granger Causality to assess whether the presence of probationers leads to crime rather than high crime areas becoming areas where probationers live. Matrix Exponential Spatial Specification (MESS) regression will also be used to evaluate these effects because this technique permits adjusting for spatial autocorrelation which could be important when dealing with very small unit of analysis such as city blocks.

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Chapter I

Review of Theory and Prior Research

Routine Activity Theory and Crime.

For a crime to occur, Routine Activity Theory argued that three elements must converge in time and space: a motivated offender, a target, and low levels of guardianship (Cohen and Felson, 1979: 589). The research for this thesis will focus on the presence of one type of offender, probationers, and the effect of their presence on the amount of crimes in residential areas. Research drawing on Routine Activity Theory has paid relatively little attention to the relationships between the presence of offenders and crime (Roncek and Maier, 1981: 725).

Studies that focus on the first element, the motivated offender, have sought to explain why certain individuals have chosen to commit crimes and others have not. According to Kennedy and Van Brunschot (2001: 31), the decision to commit a crime was based on a set of particular choices that involved an evaluation of past experiences, future expectations, and interaction with peers. Thus, motivations for offenders can easily be products of individuals' lifestyles and their assessments of whether particular crimes were attractive enough to risk the consequences of illegal acts.

Although certain individuals may be more predisposed to criminal behavior, others are attracted to crime because particular opportunities arise (Kennedy and Van Brunschot, 2001: 30). Propensity towards criminality may be a product of Zipf's (1950) "Principle of Least Effort" and "Principle of the Most

Obvious." The "Principle of Least Effort" simply stated that offenders were motivated to commit crimes because the attractions provided a simpler method to fulfill their desires (Felson, 1987: 913). In addition to the "Principle of Least Effort," Felson (1987: 913) also focused on the "Principle of the Most Obvious" to explain why offenders target victims based on how easy the targets will be to attack. For example, an offender may have chosen to burglarize a home because minimal travel was necessary and the offender was familiar with avenues of entry and exit.

The second critical element needed for crime according to Routine Activity Theory was a target. Miethe and Meier (1990) discussed how interactions between victims and targets ultimately have led to crimes: (1) routine activities typically have encouraged contacts between offenders and victims and (2) the targets are chosen according to their value and the level of guardianship over the persons or things to be victimized (Sacco and Kennedy, 2002: 68). In addition to the opportunities to commit crimes due to routine activities or lifestyles, Felson (1987: 914) also described systematic accidents. He defined systematic accidents as spontaneous criminal activities, which led to either successful gains or big losses, such as being apprehended. Research has identified characteristics of areas that provide the settings for victims and targets to be co-present while simultaneously having affected levels of guardianship.

In 1981, Roncek (1981) focused on the characteristics of areas that were "Dangerous Places" in Cleveland and San Diego. In other articles, Roncek and

his students examined the effects of different urban facilities on crime (Roncek and Bell, 1981; Roncek et al., 1981). Roncek and Bell (1981) as well as Roncek and Pravatiner (1983) focused on the relationships of bars and taverns to crime while Roncek et al. (1981) studied the relationship of housing projects to crime. Roncek and Lobosco (1983) and Roncek and Faggiani (1985) studied the effects of proximity to high schools on crime. While Spring and Block (1988) developed the concept of "hot spots" and developed the first computer program to identify "hot spots", it was only in 1989 that Sherman and colleagues analyzed hot spots in Minneapolis (Sherman et al., 1989). Their findings showed what much research had demonstrated earlier that crime levels and crime rates are disproportionately high in certain areas. They attributed many of these differences to the activities and land uses in these higher crime areas that facilitate criminal activities (Sacco and Kennedy, 2002: 68). Locations that had a disproportionate amount of crime often have developed perceptions of being "bad neighborhoods."

The structural characteristics of neighborhoods and the residential and nonresidential areas within them in which criminal events occur must provide easy access, some type of goods, and an easy escape (Sacco and Kennedy, 2002: 63). Findings from the 1998 National Crime Victimization Survey reflected the differential associations of places with crimes:

> *1 in 5 violent crimes occurred in the victim's home; another 10% occurred near the home; less than 1 in 10 happened in school or on school property; and about 4% transpired inside a restaurant, bar, or club* (Sacco and Kennedy, 2002: 63).

Felson (1987: 921) related the uses made of places to whether victimization occurred or not. The underlying assumption was that the characteristics of places facilitated interactions that led to crime, in part, through lowering the levels of guardianship.

In addition to the structural characteristics of areas affecting crime, there were the influences of space and time. Hawley (1950) identified three temporal characteristics of crime within urban neighborhoods, which are the following:

> *(1) rhythm, the regular periodicity with which events occur; (2) tempo, the number of events per unit of time; and (3) timing, the coordination among different activities, such as coordination of an offender's rhythm with those of a victim* (Cohen and Felson, 1979: 590).

Hawley's temporal characteristics of crime formed the basis for the idea that the places with targets have their own routines (Sherman et al., 1989: 32-33). These, of course, will also depend on the number and types of individuals who make use of the areas.

Indeed, the routine activities of different places cannot be fully understood without considering the individuals who use and live in these places. Claude Fischer (1975: 1325) has pointed to the importance of taking account of the number of individuals with different "lifestyles" or what now has been called routine activities for the quality of social life in residential areas within cities. The presence of potential offenders could be a critical element affecting the routine activities in different areas. Currently, research has begun to focus on the re-entry of former prisoners to communities. Yet, there has been another group of

offenders that has been present in communities for years and for whom the relationship to crime has not been studied or even discussed as extensively as those being released from prison. This ignored group has been probationers.

Offenders and Their Return to Communities.

Probationers, as a categorical group, have been another group of offenders that have re-entered into the community. Probationers as a categorical group were sanctioned by community corrections, but were given a "break" by being allowed to stay in the community while remaining supervised. While current research on re-entry remains focused on the problems of current correctional services, supervision, and programs that have assisted offenders who have been in prison with re-entry into the community; no such research has been done on re-entry of probationers (Taxman et al., 2002: 6). Both parolees and probationers are offenders who have been allowed to live in residential communities. The only prior research on offenders living in the community came from the work on re-entry; I will generalize from research on re-entry to the possible consequences of probationers living in communities. Currently no research has examined whether probationers returning back into the community actually increased or decreased crime rates and/or crime. Before exploring the possible mechanisms, which could connect the collective presence of probationers to crime, it will be useful to review programs that have focused on the re-entry of offenders into communities.

In 1999, the Office of Justice Programs established the Re-entry Partnership Initiative (RPI) (Taxman et al., 2002: 5). RPI was created to change

the focus of the correctional system from direct control of individuals by correctional agencies to community based social controls: family, peers, neighborhood organizations, employment, and various non-governmental services (Taxman et al., 2002: 12). The intent was to begin programs while offenders were incarcerated and have them continued when the offenders were released back into the community. The structures of these service programs were set-up to meet the needs of each individual offender to deter future criminal activity. Research by Taxman et al. (2002: 12) addressed the basic components that had to be present for the programs to be successful: the continuity of treatment programs, housing arrangements, employment opportunities, family services, and addressing community concerns. Even with all of the service programs available, they could only be as effective if offenders participated in the programs (Lynch and Sabol, 2001: 11).

A review of re-entry programs when offenders re-entered back into the community found that often the community did not support their return (Rhine et al., 2003:53), despite the fact that the community must be part of the re-entry effort. To facilitate community support, Ohio implemented the Citizens' Circles. The Citizens' Circles activities were to help offenders become adapted to their return to the community, to make available various community agencies, and to impose community supervision (Rhine et al., 2003: 54). Yet, the offender's duty was to stay out of trouble and continue participating in the program.

Another example of a re-entry program comes from one that was based in Pennsylvania. The Pennsylvania re-entry program assessed offenders while incarcerated to try to determine which offenders had high risk factors to re-offend (Beard and Gnall, 2003: 71). Similar to any other re-entry program, each offender began his or her participation while incarcerated. After the initial assessment, the offender was entered into several programs in which they were to continue to participate after release (Beard and Gnall, 2003: 74). Thus, offenders were given opportunities to re-connect within society and to help them avoid future criminal activity.

According to the Bureau of Justice Statistics, in 2002 approximately 6 million offenders were under some form of community supervision (Paparozzi, 2003: 47). Extensive research has focused on RPI programs that were intended to reduce the recidivism rates of offenders who have been imprisoned. Although all of the re-entry research focused primarily on offenders who were incarcerated, probationers and parolees have obvious parallel issues facing them. Paparozzi (2003: 47) found that programs for both probationers and parolees had the same three ideals: crime prevention, public safety, justice, and restoration.

Probationers as a categorical group, who were sanctioned within the community, had been required to attend mandatory service programs, remain under the supervision of a probation officer, and remain employed (Paparozzi, 2003: 47). In contrast to the re-entry process for parolees, probationers were assessed during their court proceeding and the judge determined services and

programs in which the offenders must participate as conditions of their probation. Supervision has been another condition of probation, which was also part of the re-entry process for parolees. Yet, with the increased use of community sanctions, both probation and parole officers have become overloaded with cases and at times cannot provide effective supervision. Research by Taxman et al. (2002: 5) indicated that the overload of cases for probation and parole officers was so extensive that where an offender resides was often routinely not verified.

Life Course, Persistence, and Offending

A primary issue concerning re-entry is the concern that offenders could fall back into their "old ways" and continue to engage in criminal activity. The danger may be less for probationers because they were given a "break". They could make a change in life course and cease offending. Concerns with shifts in patterns of criminal behavior have been the central focus of life course theory. According to Sampson and Laub (1993: 8) the basic concepts of life course are:

> *(1) A trajectory, which is a pathway or line of development over the life span; (2) transitions, that are marked by life events that are embedded in trajectories and evolve over shorter time spans; and (3) defined by Elder (1985:31- 32) the interlocking nature of trajectories and transitions may generate turning points or change in life course.*

Sampson and Laub (1993: 9) examined the above three life-course factors within the context of age, social history, and social structure. For example, the generation of "baby boomers" experienced several defining social events in history such as the Vietnam War, which could have affected the rates of offenders' criminal activities. The collective presence of probationers while still

under the supervision of the criminal justice system could very well have affected their routine activities, and these, in turn, could have affected the opportunities for forming conventional social bonds.

Early researchers on the development of criminal behavior focused on childhood delinquency to predict criminal activity in adulthood, i.e. whether offenders would become career criminals or desist (Gottfredson and Hirschi, 1990; Glueck and Glueck 1950; Sampson and Laub, 1993: 26). Life course researchers suggested that deviance in childhood was not an accurate predictor of criminal activities in adulthood because of later changes in social control and social bonds (Sampson and Laub, 1993: 18). Sampson and Laub (1993: 19) argued that the substantial features of age-graded social controls were: structural and intervening sources of delinquency and the consequences of delinquent behaviors in adulthood. They focused on explanations for adult crime with regard to adult informal social control and social capital. For example, as individuals move to adulthood, transitions, such as marriage, employment, children, etc. provide valuable assets whose retention becomes increasingly important to individuals. As larger numbers of individuals in residential areas and communities increasingly value these assets, levels of crime in communities should be lower than in other areas in which these processes have not occurred.

Extending Fischer's (1975: 1320) argument about the importance of a critical mass for the "subcultures" of areas would imply that if probation provided the opportunities for social bonds to form, then areas with substantial numbers of

probationers would not have higher levels of crime than in areas without them. Both bonds and social controls change from childhood to adulthood through the life course, regardless of individuals' levels of self-control. These changes can tie the individual to the community and lead to less involvement in criminal activity (Sampson and Laub, 1993: 21).

In 1950, the Gluecks evaluated 500 delinquent boys from the Massachusetts correctional system and 500 non-delinquent boys from Boston's public schools to explore delinquency (Sampson and Laub, 1993: 26). The Gluecks' findings revealed that the number of arrests for both groups of boys peaked at the ages of 17-25 and then declined with the further increases in the ages of the boys (Sampson and Laub, 1993: 29-30). Based on the Gluecks' research, there was evidence that suggested that even some boys from the non-delinquent group committed some types of deviant offenses and that both groups had experienced significant transitions to stop their criminal activity. Therefore, the majority of boys from the Gluecks' study had some type of life transition that enabled them to discontinue criminal activity.

Piquero et al. (2002: 2) studied 524 parolees from the California Youth Authority (CAY) for seven years following their release. Piquero et al. (2002: 7-8) found that marriage and employment were positively associated with decreased levels of criminal activity. The results supported the argument that local life courses were associated with the modification of criminal activities.

Research on the re-entry process for probationers must still be concerned with whether the offender will continue to commit crimes. Citizens and police must be concerned also with the consequences for residential areas of the presence of probationers if they indeed continue to commit crime or their presence draws criminal activities to the area where they reside. Since most probationers seem likely to live in the same community in which they resided before being sanctioned, they may be exposed to the same neighborhood influences that led them to criminal behavior. The Gluecks' (1950: 164) research on delinquent and non-delinquent boys revealed that 98% of the delinquents had delinquent peers, while only 7% of the non-delinquents had delinquent peers (Sampson and Laub, 1993: 100). This research indicated that offenders who continued to associate with peers who were criminals were drawn back into a life of crime. The same processes may occur for probationers, as a categorical group. This, in turn, could affect the amounts of crime in their residential areas

The little research published on probationers has focused on the characteristics of probationers who have re-offended or violated probation, but not on the places in which this offending or violating occurred (Lynch and Sabol, 2001: 20). Following Fischer (1975: 1325), the aggregate level of propensities to re-offend among probationers and their associates could reach levels that are sufficient to produce higher levels of crime in areas where probationers resided. Offenders were placed on probation because the crimes that they committed were less serious, such as property crimes and drug offenses (Mackenzie et al., 1999:

433). Therefore, it can be assumed that probationers have been less serious offenders than those who were imprisoned and then granted parole. Even though probationers were less likely to be serious offenders, the BJS reported that from 1986 to 1990, there was a 14% drop in the number of probationers that successfully completed the provisions of probation (Gray et al., 2001: 539). This decrease in successful completion in recent years could have resulted in additional crimes within the areas in which probationers lived.

Recidivism rates among probationers have been the focus of several probation studies. Gray et al. (2001) examined the violation rates of 1,500 probationers in the state of Michigan. Their research revealed that 51.8% of probationers violated probation by committing either a medium or serious new offense, such as burglary or auto theft (Gray et al., 2001: 541-550). Another study conducted by Minor et al. (2003: 34) in Kentucky, found 56.5% of probationers had at least one single violation, while another 24.2% of probationers had committed two or more violations.

Research by Clarke et al. (1988) and Morgan (1994) reported that several characteristics contributed to the failure of probationers. These were prior criminal histories, drug and alcohol problems, sex, employment, marital status, and age (Gray et al., 2001: 540-541). All of these can affect the formation of social bonds which can ultimately affect the aggregate level of social control (guardianship) and crime in residential areas.

Probationers, Offending, and Low Self-Control

Probationers who continued criminal activity after re-entering back in the community could have been those who had low levels of self-control. Low self-control individuals were defined by Gottfredson and Hirschi (1990) as persons seeking immediate gratifications, looking for easy ways to achieve their goals, finding crime exciting, having very little stability in their lives, and having low tolerance (Reid, 2000: 169). Based on the five characteristics of low self-control, Gottfredson and Hirschi (1990) argued these individuals would be drawn to criminal activity. Yet, even individuals with low self-control will not necessarily commit offenses. Gottfredson and Hirschi (1990: 91) stated that crime was a product of both low-self control and opportunity. Groups of individuals, among whom may be probationers, who have low self-control and who have available targets in areas with low guardianship could exploit these opportunities for immediate gratifications. As a result, areas with large numbers of probationers would have more crime than areas with small numbers of probationers.

In 1978, Robins (1978: 611-622) evaluated 524 children in a guidance clinic in St. Louis and compared the children to a control group that matched each child based on their age, sex, etc. (Gottfredson and Hirschi, 1990: 93). Robins discovered children referred to the guidance clinic at an early age, when compared to the control groups, were more likely to:

> *be arrested as adults, were less likely to get married, were more likely to be divorced, were more likely to marry a spouse with a behavior problem, were less likely to have children (but if they had children would have many), were more likely to have children with behavior problems, were*

> *more likely to be unemployed, had considerably more frequent job changes, were likely to be on welfare, had fewer contacts with relatives, had fewer friends, were substantially less likely to attend church, were less likely to serve in the armed forces and more likely to be dishonorably discharged if they did serve, were more likely to exhibit physical evidence of excessive alcohol use, and were more likely to be hospitalized for psychiatric problems* (Robins, 1978: 611-622 and Gottfredson and Hirschi, 1990: 93-94).

Robins' research presented a detailed description of the life course of individuals with low self-control. Based on her findings, individuals with low self-control were initially classified as antisocial children. Their classification was used as a predictor and its effects indicated that individuals who had low levels of social control were more likely to commit criminal offenses into adulthood (Gottfredson and Hirschi, 1990: 94).

Low self-control continued throughout an individual's life. According to Gottfredson and Hirschi (1990: 94-95), low self-control's continuity derived from poor parenting. The key aspects of poor parenting were lack of disciplinary actions, lack of supervision, and lack of affection in the household (Gottfredson and Hirschi, 1990: 97). Parents' inability to parent in a pattern that was constructive for a child was directly related to the inability of a child to discover appropriate behaviors and allowed a child to interact with opportunities that led to crime. Therefore, if the low self-control argument were correct, and, if there were a positive relationship between the locations of probationers and the locations of crimes, this relationship could have been due to probationers having low levels of social control.

The involvement of individuals in crime was what led to some of them being defined as probationers. Following Gottfredson and Hirschi (1990), the initial involvement could be an indicator of low self-control among these individuals. Probationers, as a categorical group, have exhibited at least one instance of behavior that could stem from low self-control. If they then came to reside in areas with substantial opportunities for crime as described, in part, by Routine Activity Theory, then their presence in residential areas would be associated with more crimes than occur in areas where probationers do not live.

Hypotheses.

In this study, two hypotheses will be tested. The first hypothesis is based on Routine Activity Theory and the theory of low self-control. Routine Activity Theory states that in order for crimes to occur in a particular place the simultaneous co-presence of a motivated offender, absence of capable guardians, and a target must converge in time and space (Cohen and Felson, 1979: 589). These theories provide possible explanations at the individual level for why particular patterns of association between crime and the presence of probationers at the level of the residential blocks could have occurred. These theories will not be tested at the individual level because such efforts are only likely to be fruitful after aggregate research such as that proposed here are completed. The presence of probationers in an area could provide an area with potential offenders. Probationers, as a categorical group, are people who have offended in the past; therefore they may be more likely to commit crimes again than those who have

not committed crimes previously. Also, probationers who have broken the law could have associates that have broken the law. Differential Association Theory (Sutherland, 1947: 5-7) has argued that individuals, who engaged in criminal activity, have learned through associations with peers that criminal behaviors were acceptable (Reid, 2000: 152). Even though probationers may not commit criminal offenses, their presence may draw in other offenders who might commit crimes in the areas where probationers resided.

The theory of low self-control argued that individuals with low self-control would be more likely to commit criminal offenses (Gottfredson and Hirschi, 1990: 91). Probationers have already demonstrated that they have potential problems with low self-control because they were already arrested and then sanctioned by the criminal justice system, making them a potential group to re-offend. These deductions from the theories led to the first hypothesis.

Hypothesis 1: *The number of probationers in an area will be positively associated with the number of crimes occurring in an area.*

The second hypothesis emerged from the life course theory. The main focus of life course theory was based on trajectories, transitions, and in the interactions, which created life changes for individuals (Sampson and Laub, 1993: 8). Probationers have already been sanctioned by the criminal justice system; therefore, they may choose to discontinue committing criminal offenses. Since probationers were given a "break," not only might they discontinue their involvement in criminal activity, but also they may provide additional

guardianship in the areas where they live. The possible fear of being incorrectly associated with criminal activity because of their pasts could lead to probationers taking actions to prevent or deter crimes in their residential areas. These arguments led to the second hypothesis.

> ***Hypothesis 2:*** *The number of probationers in an area will either have a negative association or no association with the number of crimes in an area.*

The proposed analyses will test these two hypotheses with several statistical analysis techniques. The data to be analyzed will be described in the next chapter. The third chapter will present and discuss the rationales for the statistical techniques to be used. The fourth chapter will present results and the fifth will discuss findings and present conclusions.

Chapter II

Description of the data

The City.

In 2000, the city of Omaha, Nebraska had a population of 390,007 residents (U.S. Census Bureau, 2000). Omaha's racial composition was primarily White, 78.4%, followed by African-Americans, 13.3%, Asians, 1.7%, Native Americans/Eskimo/Aleut, 0.7% (U.S. Census Bureau, 2000). The percentage of residents of Hispanic origin was 7.5% (U.S. Census Bureau, 2000). According to the US Census Bureau (2000), the median age of residents in Omaha was 33.5, 25.6% of the residents were 18 years old or younger, and 11.8% were over the age of 65. The median household income was $40,006, while the mean housing value for the city was $94,200 (U.S. Census Bureau, 2000).

Unit of Analysis.

Residential city blocks will be used as the units of analysis for this study. City blocks are defined as "small areas bounded on all sides by visible features such as streets, roads, streams, and railroad tracks, and by invisible boundaries such as city, town, township, and county limits, poverty lines, and short imaginary extensions of streets and roads" (U.S. Census Bureau, 1990, A3). City blocks are the smallest units of analysis for which Census data are available. City blocks are also physically defined as units and are the areas around which police routinely patrol. Census data provided the demographics of residents that can affect the routine activities on blocks.

Urban crime studies have focused on residential city blocks based on two primary reasons. First, crime in residential areas causes fear among residents (Taylor, 1997: 120-121). Second, the characteristics of residential areas used as independent variables can only make sense for these areas. Such characteristics as racial composition or housing value have no meaning for non-residential areas because no one lives in these areas and there are no houses there. The characteristics of totally non-residential areas such as the square footage devoted to industrial manufacturing or wholesaling are rarely relevant to residential areas.

Taylor argues that residential "face blocks" are important for understanding crime. It is, however, reasonable to extend his arguments to "island blocks" as defined by the U.S. Census as will be argued below. Typically, individuals worry about what happens in the area where they live. Individuals may resist having offenders live in their neighborhood.

Residential city blocks defined as island blocks for the Census were chosen as the units of analysis to analyze crime patterns because of the following reasons:(1) residents regularly observe their neighbors' routines, (2) living in a neighborhood often carries the responsibility to get along with fellow neighbors, (3) there is a general consensus of norms regarding acceptable and unacceptable behavior, (4) residential blocks have natural rhythms to reoccurring events, and (5) residential blocks contain and support certain behaviors (Taylor, 1997: 120-121). While interactions among residents are likely to be more frequent and

intense on face blocks, the island block is used for many routine activities such as dog walking and going to and from the face block of residence. The backs of houses and their yards and alleys, when present, could also be places that become involved in criminal activities.

Dependent Variables: Part I Index Crimes.

The dependent variables for this study were derived from the number of offenses on the city blocks, which were defined as the FBI's Part I Index Crimes. Part I Index Crimes are murder, rape, assault, robbery, burglary, larceny, and auto theft. For this research, the total of violent crimes of murder, rape, assaults, and robbery will be the first dependent variable. The second dependent variable will be the sum of burglaries and auto thefts. This total will be used as a modified property crime total because the theft data are not reliable, due primarily to poor reporting. These crime data were obtained for 2000 and 2001 from the Omaha Police Department by Dr. Dennis W. Roncek. These two different subtotals of Part I Index Crimes were selected as dependent variables because there was no available rationale from prior research for focusing on any specific crime. Both of the variables will be measured as frequencies rather than rates because the offenders and victims need not live on the blocks where the crimes occur.

In 2000, the Census Bureau defined 7,678 city blocks in Omaha. Of these, Swatt (2003) identified 6,106 that were residential blocks with enough residents so that the Census Bureau did not suppress the demographic or housing

characteristics of the block. For the city as a whole including all residential and nonresidential blocks, Tables 1 and 2 report the total number of crimes by type of incident, as well as the range, and mean number of incidents per block.

Table 1: Selected Crimes in Omaha in 2000 and 2001.
Panel A Crimes in 2000.

Incident	Total	Range	Mean
Murder	20	0 to 1	.003
Sexual Assault (Reported)	332	0 to 6	.043
Robbery	954	0 to 11	.1242
Felony Assault	719	0 to 10	.0936
Commercial Burglary	1,089	0 to 17	.1418
Residential Burglary	2,353	0 to 19	.3065
Auto Theft	4,961	0 to 30	.0650

Panel B Crimes in 2001.

Incident	Total	Range	Mean
Murder	26	0 to 3	.0034
Sexual Assault (Reported)	318	0 to 6	.0518
Robbery	838	0 to 12	.136
Felony Assault	974	0 to 11	.142
Residential Burglary	2,415	0 to 32	.3931
Commercial Burglary	773	0 to 7	.1258
Auto Theft	3,457	O to 27	.5627

Presence of Probationers.

The presence of probationers is the primary independent variable for this study. Alternative theories about the importance of relationship between offenders and crime suggest that there could be very different effects associated with the concentration of probationers on crime. Gottfredson and Hirschi (1990: 91) argued that individuals with low self-control were more likely to commit criminal offenses. Probationers could be a group that has low self-control because they were already involved in criminal activities. Since they have already demonstrated that they were either motivated to offend or not unwilling to offend, they could be potential offenders who have a higher potential to re-offend then individuals who have never been offenders.

From Routine Activity Theory, it is reasonable to expect that places with the presence of more offenders will have more crime. Since these probationers have offended, they have the potential to re-offend if the opportunity were present. Since most probationers presumably return back to the same communities in which they lived before being sentenced, they could have had friends in the community or have attracted old friends that were criminals themselves. Although probationers may not be committing crimes, they may have attracted other offenders who are their acquaintances to their areas of residence. These other offenders might then commit crime in the areas where probationers lived.

According to life course theory, trajectories, transitions, and the interaction of these two life experiences together create turning points in an offender's life (Sampson and Laub, 1993: 8). Probationers have been among the least serious offenders who were given a "break" by being sanctioned within their own communities. Having been given a "break" may have produced a turning point for these individuals. Probationers may no longer want to commit crimes because of fear of going to prison. Therefore, probationers may become more cautious about becoming involved in crime and may also become more watchful over their residential areas; as a result, the presence of probationers may actually provide additional guardianship in the community.

The probation data were obtained from 2000 and 2001 from the Douglas County Court Probation Office by Dr. Dennis W. Roncek. In 2000, there were a total of 8,655 probationers in Omaha. The Douglas County Court Probation Office collected each offender's address. These addresses were edited and geocoded to city blocks as defined by the U.S. Census Bureau, using commercial, census, and county maps. Addresses with errors in the street prefixes and suffixes were corrected by the visual inspection of the maps. After the addresses were geocoded for the first time, there were only 6,382 offender's addresses that matched successfully with the addresses on the maps. The remaining 2,273 addresses were fixed manually for a total of 8,397 probationers' addresses and then gecoded again. The addresses of 258 probationers had to be classified as

defective addresses because they lacked a specific street address, or were outside of the city. These addresses were excluded from this study.

For 2001, all defective addresses (out of city, homeless, and incomplete addresses) were removed prior to receiving the data for this year. In 2001, there were a total of 8,158 probationers in Omaha. These addresses were again corrected and geocoded to city blocks as before. Addresses with errors in the street prefixes and suffixes were fixed by visual inspection of the maps. After the addresses were geocoded for the first time, there were only 5,946 offender's addresses that matched successfully. The remaining 2,212 addresses were manually fixed to produce a total of 8,158 addresses to be analyzed.

Percentage of African-Americans.

In 2000, 13.3% of Omaha's populations were African-Americans (U.S. Census Bureau, 2000). The greatest concentrations of African-Americans were located in North Omaha. North Omaha has been one of the most disadvantaged areas in Omaha. Traditionally African-Americans have had substantial involvement with crime. Research by Hindelang (1978) identified that African-Americans have a greater risk of being victimized and have a greater potential to engage in criminal activities (Piquero et al., 2002: 3). Therefore, the concentration of African-Americans will be used to control the effects of probationers for the effects of the disadvantaged minority groups on the blocks.

Percentage of Hispanics.

The percentage of Hispanic individuals residing within the city of Omaha was 7.5% (U.S. Census Bureau, 2000). Hispanics have been disproportionately concentrated in South Omaha. Since Hispanics were the second largest minority group in Omaha, they could also be susceptible to the similar risks of victimization and of the propensity to commit criminal offenses, as African-Americans (Hindelang 1978 and Piquero et al., 2002: 3). Concentrations of Hispanics on blocks could be associated with larger numbers of criminal events occurring.

Percentage of Residents over the age of 65.

Age-graded research has indicated that as individuals mature, their involvement in criminal activities decreases (Sampson and Laub, 1993: 6). Individuals have generally begun to decrease their activity levels and to spend more time in their residences, thus decreasing their potentials to be victimized. Also, as a result of spending more time in their residential areas, there could be more monitoring of activities than in other areas. Consequently, areas with higher concentrations of elderly could have higher levels of guardianship and would be associated with less crime as found in past studies by Roncek (2000), Roncek et al. (1981), and Cohen and Felson (1979: 589). Increased concentrations of elderly are likely to be associated with fewer criminal events (Cohen and Felson, 1979: 589).

Percentage of Primary Individuals Under 65.

Primary individuals were as defined by the U.S. Census as "household heads who do not live with relatives." Such individuals can have relatively high risks of victimization according to prior research (Roncek, 1981; Roncek and Maier, 1991). Primary individuals under 65 could spend substantial amounts of time away from their residences, due to various life activities, such as seeking companionship and out of home entertainment. Since primary individuals under 65 could be away from their residences more frequently than those over 65, higher concentrations of younger primary individuals could produce lower levels of guardianship and could facilitate criminal activities (Cohen and Felson, 1979: 590).

Residential Population.

Wirth (1938: 11-12) argued that as the size of cities' populations became larger, the level of direct social interactions changed, thus leading to anonymity. Roncek (1981) in extending Wirth's argument to residential areas hypothesized that the size of the residential population on city blocks could be associated directly with higher frequencies of criminal events. In addition, the levels of guardianship could be affected by the size of the residential populations because the larger the number of individuals residing in an area, the less likely they will be to know and/or protect each other thus increasing anonymity and decreasing guardianship.

Population Density.

Wirth (1938: 16) also argued that higher levels of population density had negative consequences for social life:

> *Frequent close physical contact, coupled with great social distance, accentuates the reserve of unattached individuals towards one another and, unless compensated for by other opportunities for response, give rise to loneliness.*

One aspect of isolation or loneliness is anonymity, which can decrease levels of guardianship. Therefore, population density has the potential to affect the opportunities for criminal events to occur.

Number of Adjacent Blocks.

The number of adjacent blocks can be associated with a higher potential for a larger number of individuals to have easy accessibility to a block. This would expose such individuals to being victimized on blocks. The larger the number of adjacent blocks could also increase the accessibility of potential offenders to these blocks. Anonymity could be increased and guardianship decreased.

Number of Multiple Residence Parcels.

For 2000, the U.S. Census Bureau no longer reported the percentage of units in multi-unit structures; therefore, a parcel file was used to identify blocks with such housing. According to Taylor (1997: 134) apartments are less private and can provide situations and settings that lead to conflicts between their residents. As a result of apartments being less private than homes, many

individuals will be coming and going to and from apartments, thus exposing residents and their possessions to more individuals than would be the case in single-family housing areas. The percentage of multiple residences on a block could potentially affect number of criminal events occurring there.

Commercial Land Use.

Roncek and Bell (1981) found that nonresidential land uses could be associated with crime. An area with frequent use can have the potential to attract various groups of people into the area, thus leaving their residences with the potential to be victimized. The potential to be victimized in an area with commercial land used could also have weakened the strength of social controls that would ordinarily be present in residential areas (Taylor, 1997: 134). The percentage of commercial parcels that are on each block will be an independent variable used in the analysis to control the effects of the presence of probationers for the effects of these land uses.

Presence of a Bar.

Research by Roncek and Bell (1981), Roncek and Maier (1991), and Murray (2002) indicated that the presence of a bar was associated with higher levels of criminal activity. The relationship between the presence of bars and crime could have stemmed from several processes:(1) patrons of a bar could become potential targets because opportunities for interpersonal conflict or monetary gain arose and there was an absence of capable guardians, (2) bars always had money and goods that were readily available, and (3) intoxicated

individuals could have engaged in activities that they may not have participated in if they were sober (Roncek and Maier, 1991: 726). The number of bars on each block will be used in the analysis as an independent variable.

Presence of an Offsite Liquor Establishment.

The presence of offsite liquor establishments could have similar effects to those for bars. Therefore, the number of these businesses on each block will be used as an independent variable. These establishments have a high volume of individuals using them in a short period of time, thus creating opportunities for criminal offenses. The potential for crimes to occur outside or inside offsite liquor establishments can be high because of the absence of guardianship. Offsite liquor businesses can have few personnel and may not be likely to provide active social control outside the building. Patrons could linger outside these businesses to await opportunities for obtaining more alcohol by either legal or illegal means, which can result in crime. The patrons of these establishments can create opportunities to commit criminal offenses (Roncek and Maier, 1991: 726; Murray, 2002).

Average Housing Value.

The average value of owned housing will be the indicator of the socioeconomic status of residents on a block. Socioeconomic status has been linked with the amount of crime in areas in many studies of urban crime; Roncek et al. (1981); Bursik and Webb (1982). Measures of average income have never been available from the U.S. Census for city blocks; the value of average

housing has been used as a substitute for income because the requirements for house purchasing are very closely tied to income (Roncek, 1981; Roncek and Maier, 1991). The average value of owned housing was constructed from the parcel file because, for 2000, the U.S. Census no longer reported the average value of owned housing.

Vacancy Rate.

The vacancy rate of a block could affect the number of crimes on a block. Vacant structures on a block could have provided opportunities for crimes to occur because of the absence of guardianship. Prior research by Roncek and Maier (1991: 740) has shown that the percentage of vacant housing was positively associated with criminal activities. The vacancy rate measure is the percentage of all housing units whether they are rental or owned units that are vacant.

Percent Single Mothers with Children Under 18.

According to Sampson (1987) the concentrations of single-parent households affected the likelihood for criminal activities (Gottfredson and Hirschi, 1990: 103). If single mothers were more likely to be away from their residence, then their residential areas would have low levels of guardianship (Cohen and Felson, 1979: 590). The absence of additional parental supervision due to lack of a second parent could foster lower levels of social control over children. High concentrations of single mothers in an area could also attract additional males to the area for companionship. The presence of additional males could result in additional conflicts, which could be crimes.

Table 2 contains basic descriptive statistics for the independent variables for the residential blocks. These are for the 6,106 blocks identified by Swatt (2003).

Table 2: Descriptive Statistics of Independent Variables.

Indep. Variables	**Mean**	**Std. Deviation**	**Range**
% African American	15.08	27.46	0 to 100
% Hispanics	6.97	14.14	0 to 100
% Over 65	13.35	13.34	0 to 100
% Primary Indiv. Under 65	17.86	17.59	0 to 100
Residential Pop.	62.86	70.29	1 to 1516
Pop. Density	11.19	14.80	0 to 516
# of Adjacent Blocks	6.98	2.59	1 to 31
# of Multiple Residential Parcels	.48	1.43	0 to 22
Commercial land use % Commercial Parcels	5.65	16.33	0 to 100
# of Bars on Block	3.06	.19	0 to 3
# of Offsite on Block	2.80	.19	0 to 3
Average Housing Value	90,393.2	92,594.78	100 to 4,577,300
Vacancy Rate	4.53	7.76	0 to 94
% Single Mothers w/ Children Under 18	8.58	11.73	0 to 100

Chapter III

Methodology

T-tests for Difference of Means.

T-tests will be used to examine the difference between residential blocks with and without probationers across the different crime types and the other independent variables. This analysis will provide a broad overview of the overall relationship between the presence of these individuals and crime and between the presence of probationers and the characteristics of the blocks. Two-tailed t-tests will be conducted because the independent variables could have either a positive or a negative association with crime. A probability of .05 or less will indicate a statistically significant difference in the average amounts of crimes occurring on blocks with and without probationers and the differences in the characteristics of the blocks.

Tests for Multicollinearity.

Variance Inflation Factors and the Condition Number test will be used to determine whether there is serious multicollinearity among the independent variables. The Variance Inflation Factors indicate the location and severity of multicollinearity of the independent variables. The best critical value for the Variance Inflation Factors is 4.0; above 4.0 there is a potential problem of multicollinearity. Although below 5.0 has been acceptable as indicating the lack of serious collinearity.

For the Condition Number test, the critical value of the condition index that indicates whether muticollinearity is present is 30 or more accompanied by two variance decompositions proportions greater than .5. Independent variables that do not have a score of 4 on the Variance Inflation Factors and do not meet the criteria of the Condition Number test will be regarded as being free of serious multicollinearity.

Regression Analysis: Ordinary Least Squares.

Ordinary Least Squares (OLS) regression analysis will be used in this analysis to indicate the linear relationships between dependent and independent variables. These analyses will provide a baseline for comparison with the results of a more sophisticated technique that is more appropriate for spatial data and whose unstandardized and standardized have similar interpretations to those for OLS coefficients. In order for a dependent variable to meet the assumptions of regression, it will be measured on at least an interval scale, while the independent variables must be measured on at least an interval scale or be dichotomous. From the regression analysis, the unstandardized coefficients will provide the effects of the independent variables on the dependent variable. Coefficients found to be statistically significant will have a probability of t less than or equal to .05. Statistically significant coefficients will be then be assessed based on their importance as indicted by the standardized estimates or beta weights.

Granger Causality

Cross-sectional analysis cannot show relationships to be causal. This is a problem for the question addressed in the research because there could be processes that lead probationers to live in high-crime areas rather than the presence of probationers leading to crime. One strategy for providing evidence for the presence of probationers leading to crime rather than high crime areas becoming areas where probationers live comes from analysis strategies associated with Granger Causality.

Ordinarily, casual relationships are easily understood as, if x causes y then y does not cause x. Simple causality is, however, hard to demonstrate. Granger Causality is easier to demonstrate, but does require data for more than one time period for the dependent variable (Granger 1969; Sims, 1999: 1).

In this research, I will begin examining Granger Causality by using 2000 Census data and the location of probationers in 2000 to predict 2001 crime. Following this, I will use 2000 Census and crime data in 2000 to predict the locations of probationers in 2001. If the effect of probationers in 2000 on crime in 2001 is greater than the effects of crimes in 2000 on probationers in 2001, then the presence of probationers has a Granger casual relationship to crime. If the reverse pattern occurs, then high crime areas are attracting probationers rather than the presence of probationers being the cause of crime.

Spatial Autocorrelation.

Regression analyses are based on the assumption that errors of prediction for the dependent variable are independent of one another. Spatial data usually violate this assumption because the error in predicting the amount of crime in a particular area is typically correlated with the error in predicting crime on its neighboring areas, e.g., the city blocks, which share a side or corner with a particular block. To cope with spatial autocorrelation, I will use the Matrix Exponential Spatial Specification (MESS) model.

The Mess model is a new strategy by Pace and LeSage (2001: 2) that identifies spatial autocorrelation effects without having to compute the inverse of an NxN matrix. It produces a coefficient identified as alpha, which is the spatial autocorrelation parameter that measures the decline in the value of dependent variable due to its diffusion to neighboring areas (Pace and LeSage 2001: 8-9). By using theorems from matrix algebra, Pace and LeSage (2001: 2-7) were able to create a more effective strategy to estimate spatial autocorrelation effects for large data sets. This was previously not possible.

Chapter IV

Results

Introduction

No prior research has examined the relationships between the geographical locations of probationers and crime in their residential areas. Because of this, there is no model to follow for the analysis of this research. Therefore, several different types of analyses will be undertaken. The analyses used can serve as a model for new strategies for dealing with spatial relationships among urban crime data.

The analyses will begin with t-tests for the differences of means and then proceed to multivariate analyses. The multivariate analyses will use Ordinary Least Squares (OLS) to provide baseline cross-sectional effects and baseline effects for testing Granger Causality. The final analyses will adjust for spatial autocorrelation using the Matrix Exponential Spatial Specification (MESS) of Pace and LeSage (2001). Both cross-sectional MESS models and those needed for examining Granger Causality will be computed.

Results of T-tests for Difference of Means.

T-tests for the difference of means are used to identify the gross, uncontrolled differences in crimes and other characteristics between blocks with and without probationers. Table 3 and Table 4 contain the results of two-tailed tests for the difference of means. The first two columns of numerical results

contain means for blocks with and without probationers for crimes, as well as demographic, housing, and land use characteristics. The differences between residential blocks with and without probationers for average amounts of the different crime types are substantial. Differences for the independent variables other than having probationers on a block are also examined to check whether there are other statistically significant differences between these two groups of blocks.

The results in Table 3 indicated that residential blocks with probationers in 2000 had a higher mean number of crimes than did blocks without probationers. For both violent and property crimes, the average number of crimes on blocks with probationers was two to three times as large as on blocks without probationers. Statistically significant differences in the average number of crimes were also present for all of the components of these two aggregates of crimes. All of the other variables except for the number of commercial parcels had statistically significant differences across these two groups of blocks.

The results in Table 4 indicated that residential blocks with probationers in 2001 had a higher mean number of crimes then did the blocks without probationers. The average number of violent crimes on blocks with probationers was almost four times as large as on blocks without probationers. For modified property crimes, the average for blocks with probationers was more than two times as large as for blocks without them. Also, these differences persisted for the component crimes of these totals. Again for 2001, all of the control variables had

statistically significant differences in their average levels between blocks with and without probationers except for the number of commercial parcels. These differences in the average amounts of crime and the averages of the control variables indicated the need to use multivariate techniques to control the relationship of probationers and crimes for the effects of the other variables.

Table 3. Test for Difference of Mean Numbers of Crimes on Blocks With Probationers and Blocks Without Probationers for 2000

Crime	With Probationers	Without Probationers	t	p
Violent	0.5261	0.1598	13.30	<.0001
Mod Prop	1.6997	0.5201	21.47	<.0001
Homicide	0.0073	0.0015	2.83	.0.0047
Sexual Aslt	0.0808	0.0238	8.45	<.0001
Felony Aslt	0.2394	0.055	10.89	<.0001
Robbery	0.1986	0.0794	7.96	<.0001
Res. Burglary	0.6293	0.1802	17.37	<.0001
Comm. Burglary	0.1774	0.0776	7.50	<.0001
Vehicle Theft	0.893	0.2624	19.37	<.0001
% Prim Ind. < 65	20.159	15.818	9.74	<.0001
% Fem Hd. w < 18	11.721	5.7912	20.07	<.0001
Vacancy Rate	5.6175	3.566	10.40	<.0001
% Own Oc.	58.9	77.755	24.23	<.0001
% > 65	10.904	15.528	14.10	<.0001
% Af. Am	23.734	7.4114	23.64	<.0001
Percent Hispanic	9.2732	4.9311	11.91	<.0001
# Mul. Res.	0.7488	0.2485	13.31	<.0001
LN(House Val)	10.846	11.332	22.60	<.0001
# Comm. Parcels	5.7715	5.5485	0.54	0.5920
Population Density	13.345	9.2782	10.63	<.0001
Population	82.245	45.659	20.17	<.0001
# Adj. Blocks	7.3902	6.6094	11.74	<.0001
Public Housing	0.0072	0.0009	4.89	<.0001
Area	10.044	7.8855	4.62	<.0001
Bars	0.0404	0.0219	3.69	0.0002
Offsite Liquor	0.0338	0.0229	2.28	0.0228
N	2870	3236		

Table 4. Test for Difference of Mean Numbers of Crimes on Blocks With Probationers and Blocks Without Probationers for 2001

Crime	With Probationers	Without Probationers	t	p
Violent	0.4668	0.1240	13.77	<.0001
Mod Prop	1.8026	0.7002	19.38	<.0001
Homicide	0.0056	0.0009	3.14	.0.0017
Sexual Aslt	0.0836	0.0181	9.69	<.0001
Felony Aslt	0.1788	0.0377	10.67	<.0001
Robbery	0.1988	0.0672	8.98	<.0001
Res. Burglary	0.5873	0.2025	16.46	<.0001
Comm. Burglary	0.151	0.0985	3.47	<.0001
Vehicle Theft	1.0643	0.3992	17.54	<.0001
% Prim Ind. < 65	19.849	16.119	8.38	<.0001
% Fem Hd. w < 18	11.754	5.8038	20.11	<.0001
Vacancy Rate	5.7264	3.4853	11.36	<.0001
% Own Oc.	58.777	77.729	24.23	<.0001
% > 65	11.028	15.387	13.33	<.0001
% Af. Am	23.41	7.8095	22.46	<.0001
Percent Hispanic	9.2675	4.9668	11.76	<.0001
# Mul. Res.	0.7436	0.2565	12.93	<.0001
LN(House Val)	10.846	11.328	22.42	<.0001
# Comm. Parcels	5.5395	5.7528	0.51	0.6069
Population Density	13.059	9.5569	9.36	<.0001
Population	81.87	46.245	19.53	<.0001
# Adj. Blocks	7.3811	6.6229	11.36	<.0001
Public Housing	0.0112	0.0009	4.90	<.0001
Area	10.248	7.723	5.33	<.0001
Bars	0.0379	0.0242	2.74	0.0062
Offsite Liquor	0.0362	0.0209	3.17	0.0015
N	2847	3259		

Results of Ordinary Least Square Regression

Ordinary Least Square (OLS) Regression controls the effects of the number of probationers for the effects of other characteristics of the blocks and provides a baseline for comparison with the results of a more sophisticated technique. The first sets of regressions are cross-sectional to examine the controlled differences that parallel and extend the results of the t-tests. The use of OLS identifies the linear relationships between dependent and independent variables and provides standardized coefficients (Beta) that rank the relative importance of the independent variables. This type of regression also provides an R-squared that indicates the strength of the entire model in accounting for variance in the dependent variable.

Table 5 and Table 6 contain the results of the OLS regression analyses. Before discussing these results, it is important to note that the correlations among independent variables in these data are very low with Variance Inflation Factor scores between 1 and 2. The lowest possible value of a Variance Inflation Factor is 1.0 which indicates that an independent variable is completely uncorrelated with all other independent variables. These scores indicate that no serious multicollinearity is present within either model. Variance Inflation Factors of more than 4 indicate serious problems of multicollinearity. The regressions for both 2000 and 2001 also pass the condition number test because there is not one condition index greater than 30 in the output (Belsley, Kuh, and Welsch, 1980).

The cross-sectional regression results in Table 5 and 6 are statistically significant and account for substantial amounts of the variances in violent and property crimes given that units of analysis are city blocks (Roncek 1981). Table 5 has the results of OLS regressions on violent crimes and modified property crimes using probation in 2000. Both standardized coefficients (Beta weights) and unstandardized coefficients are presented. The number of probationers in 2000 has statistically significant effects on both violent and property crimes in 2000. In fact, probation in 2000 had the largest standardized effects or Beta weights on both violent and property crimes. Thus, it is the most important independent variable in the regression. The b-coefficients or unstandarized coefficients indicate that there is an expected .126 additional violent crimes and an expected .357 additional property crimes on the residential blocks for each additional probationer on a residential block.

Table 6 has the results of the OLS regressions on violent crimes and modified property crimes in 2001 using probation in 2001. Once again, the number of probationers on the residential blocks in 2001 has the largest standardized coefficients and, thus, the strongest effects on both violent and property crimes in 2001. The unstandardized coefficients indicate that there are an expected additional .121 violent crimes and an expected additional .276 property crimes on residential blocks for each additional probationer on a residential block.

The cross-sectional regression results cannot provide very substantial evidence for causality because both dependent and independent variables are measured at the same time and the choice of which is dependent or independent is made on the basis of the theory. Cross-sectional analyses do not permit addressing time order, which is one of the traditional criteria for establishing causal effects. One strategy for examining whether there is a stronger basis for believing in a particular causal order comes from the concept of Granger Causality. The next section will describe the results of regressions used to approximate this approach.

Table 5. Regression on Violent Crimes and Modified Property Crimes Using Probationers in 2000

	Violent Crimes		Modified Property Crimes	
Variables	Beta	b	Beta	b
Prob. 2000	.325*	.126*	.453*	.357*
% Prim Ind. < 65	-.02	.001	.054*	.007*
% Fem Hd. w < 18	.038*	.003*	.009	.002
Vacancy Rate	.019	.003	.015	.004
% Own Oc.	.005	.000#	-.109*	.007*
% > 65	-.018	-.001	.020*	.003
% Af. Am	.059*	.002*	-.000#	-.001
Percent Hispanic	.051*	.004*	.051*	.008
# Mul. Res.	.078*	.057*	.043*	.064
LN(House Val)	-.035*	-.042*	.049*	-.064*
# Comm. Parcels	.107*	.007*	.104*	.014*
Population Density	.023	.002	-.018	-.003
Population	.010	.000#	.192*	.006*
# Adj. Blocks	.039*	.016*	.036*	.029*
Public Housing	.097*	1.32*	.006	.169
Area	.004	.000#	.007	.000#
Bars	.041*	.224*	.021*	.232*
Offsite Liquor	.162*	.910*	.092*	1.05
Intercept		.309		.862
R-Squared	.274*		.496*	

b <.00051

* Statistically significant with p at .05 or less

Table 6. Regression on Violent Crimes and Modified Property Crimes Using Probationers in 2001

	Violent Crimes		Modified Property Crimes	
Variables	Beta	b	Beta	b
Prob. 2001	.323*	.121*	.316*	.276*
% Prim Ind. < 65	.023*	.001*	.052*	.006*
% Fem Hd. w < 18	.045*	.004*	.054*	.010*
Vacancy Rate	.019	.002	.009	.003
% Own Oc.	.015	.000#	-.119*	-.008*
% > 65	.005	.000#	.025*	.005*
% Af. Am	.050*	.002*	-.024	.002
Percent Hispanic	.027*	.002*	.055*	.009*
# Mul. Res.	.053*	.035*	.043*	.066*
LN(House Val)	-.018	-.019	.013	.033
# Comm. Parcels	.116*	.007*	.109*	.015*
Population Density	-.004	-.000#	-.009	-.001
Population	.066*	.001*	.217*	.007*
# Adj. Blocks	.037*	.014*	.051*	.043*
Public Housing	.105*	1.28*	.002	.066
Area	-.025	-.001	.005	.001
Bars	.037*	.184*	.044*	.503*
Offsite Liquor	.214*	1.09*	.127*	1.50*
Intercept		-.037		-.018
R-Squared	.296*		.415*	

b <.00051

* Statistically significant with p at .05 or less

Results of OLS Analyses for Granger Causality

Table 7 provides the results of OLS regression of crimes in 2001 on probation in 2000 and the control variables. The crimes are divided into two categories: violent crimes and modified property crimes. The R-squared for each crime type is statistically significant and this indicates that the combined effects of all the independent variables are statistically significant for both categories of crimes. Probation in 2000 has the strongest standardized effect for both violent and property crimes. The unstandardized coefficient indicates that there is an expected additional .124 violent crimes in 2001 and an expected additional .283 property crimes on residential blocks for each additional probationer on a residential block in 2000. From this analysis, it appears the effects of probation in 2000 on crimes in 2001 is consistent with findings that would be expected if probation has a Granger-causal relationship to crime.

The second regression model examines Granger Causality on probation in 2001 as a dependent variable and regresses it on crimes in 2000 and the control variables. Table 8 has these results. The regression equation in this table is statistically significant, with an R-squared that is larger than that for the previous regression. Modified property crimes in 2000 has the second largest standardized coefficient, while the number of violent crimes in 2000 has the fourth largest effect as the sizes of the beta weights show. The unstandarized coefficients indicate that there are an expected .267 additional probationers in 2001 for each additional violent crime in 2000 and an expected additional .379 probationers for

every additional property crime. At this point, the results of these regressions do not indicate clearly whether the locations of probationers has a Granger-causal relationship to crime or whether crime is a Granger-cause of the locations of probationers. These analyses, however, have not been taken possible spatial effects into account and these can be important when the units of analysis are as small as city blocks since both potential victims and offenders can often easily move from one block to an adjacent block.

Table 7. Regression on Crimes in 2001 Using Probation in 2000 (Granger Causality)

	Violent Crimes in 2001on Prob. 2000		Property Crimes in 2001 on Prob. 2000	
Variables	Beta	b	Beta	b
Prob. 2000	.353*	.124*	.348*	.283*
% Prim Ind. < 65	.027*	.001*	.052*	.006*
% Fem Hd. w < 18	.043*	.003*	.052*	.009*
Vacancy Rate	.021	.003	.011	.003
% Own Oc.	.011	.000#	-.123*	-.009*
% > 65	.009	.000#	.029*	.005*
% Af. Am	.037*	.001*	-.011	.002
Percent Hispanic	.029*	.002*	.057*	.009*
# Mul. Res.	.057*	.038*	.046*	.071*
LN(House Val)	-.013	-.014	.018	.044
# Comm. Parcels	.113*	.007*	.106*	.014*
Population Density	-.005	-.000#	-.011	-.002
Population	.056*	.001*	.207*	.006*
# Adj. Blocks	.032*	.012*	.046*	.039*
Public Housing	.089*	1.09*	.012	-.352
Area	-.023	-.001	.007	.001
Bars	.037*	.183*	.044*	.502*
Offsite Liquor	.214*	1.09*	.128*	1.51*
Intercept		-.071		-.259
R-Squared	.310*		.428*	

b <.00051

* Statistically significant with p at .05 or less

Table 8. Regression on Probation in 2001 Using Crimes in 2000 (Granger Causality)

Variables	Beta	b
Violent 2000	.111*	.267*
Mod. Prop. 2000	.319*	.379*
% Prim Ind. < 65	.013	.002
% Fem Hd. w < 18	.067*	.014*
Vacancy Rate	.023*	.007*
% Own Oc.	-.026	-.002
% > 65	-.019*	-.004*
% Af. Am	.184	.017
Percent Hispanic	.029*	.005*
# Mul. Res.	.062*	.109*
LN(House Val)	-.028*	-.082*
# Comm. Parcels	-.053*	-.008*
Population Density	-.011	-.002
Population	.342*	.012
# Adj. Blocks	-.011	-.011
Public Housing	.009	.316
Area	-.054*	-.008*
Bars	-.005	-.073
Offsite Liquor	-.045*	-.606*
Intercept		.849
R-Squared	.504*	

* Statistically significant with p at .05 or less

Results of Maximum Exponential Spatial Specification Model

This section will adjust for possible spatial autocorrelation by using the Maximum Exponential Spatial Specification (MESS) model presented by Pace and LeSage (2001). The MESS model uses maximum likelihood estimation to obtain the unstandardized coefficients for independent variables and an estimate of the effects of spatial autocorrelation, which is identified by a parameter called alpha (Pace and LeSage 2001: 8-9). The programs used to compute the MESS models for this research were developed from Matrix Laboratory (MatLab) programs provided by Dr. James P. LeSage at the University of Toledo in Toledo, Ohio at his website (www.econ.utoledo.edu/faculty//lesage/lesage.html).

To adjust the unstandardized coefficients of the independent variables for the different scales of measurement, a semi-standardized MESS coefficient was developed for this research by Dr. Dennis W. Roncek. The larger the size of the MESS semi-standardized coefficient the more important the independent variable, in absolute value of course. A MESS semi-standardized coefficient is equal to the product of a MESS unstandardized coefficient multiplied by the standard deviation of its independent variable. The results are presented in two subsections. Cross-sectional results are in the first subsection. The second subsection reports the regressions across years for examining Granger Causality.

Cross-Sectional MESS Model Results

Three cross-sectional MESS results will be presented for each year. The first two sets of results will be from separately regressing the number of violent crimes and the number of property crimes on the number of probationers on each block. The third model for each year will treat the number the number of probationers as a dependent variable and regress it on the number of violent and property crimes and control variables for each year. This last regression indicates the potential effects of crimes on the locations of probationers and is a prelude to the more detailed estimates of Granger Causality in the second subsection. Table 9a contains the cross-sectional results of regressing violent crime in 2000 on probation in 2000. The R-squared is .274, which is statistically significant and indicates that all of the independent variables account for 27% of the varaince in the dependent variable. Probation in 2000 is statistically significant and also has the largest standardized coefficient. The unstandardized coefficient indicates that an additional .119 violent crimes can be expected for each additional probationer on residential blocks. The connection for spatial autocorrelation, which the MESS model provides is called alpha and it is statistically significant. This indicates that correcting for spatial auto-correlative effects is necessary. The alpha coefficient indicates that the effect of the amount of crime on a specific block on crime on its neighboring blocks decreases across space.

To provide another easily interpretable measure of the effect of the locations of probationers, another MESS model for violent crimes was computed

to allow calculating the unique variance associated with probation. This model contains all the control variables but omits probation. The difference in R-squared multiplied by 100 between the models with and without probation gives the percentage of explained variance that is uniquely due to the use of the number of probationers as an independent variable. The unique variance of the number of the probationers for violent crime was 5.4%. The full results of this second model are not presented because the effects of the control variables are virtually identical to their effects in the model containing probation.

Table 9b presents the results of a cross-sectional MESS model for property crime in 2000 on probation in 2000. The R-squared for this model is .500, which is statistically significant and indicates all the independent variables account for 50% of the variance in the number of property crimes across individual blocks. This particular R-squared is substantially larger then for the model for violent crimes. The large R-squared is due to property crimes occurring more frequently than violent crimes. Once again, probation in 2000 is statistically significant and has the largest standardized coefficient. The unstandardized coefficient of probation in 2000 indicates that an additional .354 property crimes can be expected for each additional probationer on residential blocks. Based on the results of this MESS model, probation is also related to property crimes. The unique variance of probation in 2000 in accounting for variance in property crimes was 11.7%. In other words, after controlling for the effect of all other block characteristics, the number of probationers on residential city blocks can

account for 11.7% of the variation in the number of property crimes across these blocks.

Table 9a. MESS Results Violent Crime in 2000 on 2000 Probation : Cross-Sectional Results

Variable	Semi Standardized B	b
Constant		.156
Probation 2000	.355*	.124
% Prim.Ind<65	-.022	-.001
% Fem. Hd	.035*	.003*
Vacancy Rate	.018	.002
% Own Oc.	.012	.000
% >65	-.017	-.001
% Black	.047*	.002*
% Hispanic	.045*	.003*
% Mul. Res	.076*	.053*
Ln(House Val)	-.028	-.032
#Comm. Parcels	.104*	.006*
Population Density	.023	.002
Population	.013	.000
# Adj. Blocks	.045*	.017*
Public Housing	.094*	1.210*
Area	.003	.000
Bars	.044*	.227*
Offsite Liquor	.169*	.906*
Alpha		-.135*
R-squared	.274*	
Unique Variance of Probation	0.054*	

*Statistically Significant with p at .05 or less.
Statistically Significance was reported as an indicator of the likelihood that the sizes of the observed coefficients are not due to chance.

Table 9b. MESS Results Modified Property Crime in 2000 on 2000 Probation: Cross-Sectional Results

Variable	Semi Standardized B	b
Constant		.540
Probation 2000	.955*	.354*
% Prim.Ind<65	.109*	.006*
% Fem. Hd	.016	.001
Vacancy Rate	.033*	.004*
% Own Oc.	-.201*	-.006*
% >65	.042*	.003*
% Black	-.019	-.001
% Hispanic	.091*	.006*
% Mul. Res	.080*	.056*
Ln(House Val)	-.044	-.051
#Comm. Parcels	.208*	.013*
Population Density	-.042*	-.003*
Population	.410*	.006*
# Adj. Blocks	.091*	.035*
Public Housing	.010	.129
Area	.011	.001
Bars	.046*	.240*
Offsite Liquor	.196*	1.049*
Alpha		-.111*
R-squared	.500*	
Unique Variance of Probation	.117*	

* Statistically Significant with p at .05 or less.

Table 9c gives the effects of using both crime types in 2000 as independent variables to explain probation in 2000. The purpose of this analysis is to examine the potential for crime having Granger-causal relationships to probation. It is possible that probationers either move or live in higher crime areas because they cannot afford to live elsewhere. The R-squared is a statistically significant at .542 and accounts for 54% of the variance in the number of probationers on the blocks. Violent crime and property crime both have statistically significant effects. Property crime has the largest standardized coefficient and violent crime ranks fifth in relative importance. The unstandarized coefficients indicate that an additional .362 probationers can be expected to live on a city block for each violent crime on a block and an additional .477 probationer can be expected for each additional property crime on the residential blocks. The unique variance associated with including both crimes into the MESS model of probation was 12.5%.

The results of the next regressions are for the cross-sectional analysis of the relationships of crimes to probationers in 2001. Table 10a presents the results of using a MESS model to estimate the number of violent crimes in 2001 on each block from the number of probationers in 2001. The R-squared is statistically significant at .301 and accounts for 30% of the variance in the number of violent crimes on residential blocks. Probation was statistically significant and had the largest standardized effect. The unstandardized coefficient indicates an additional .119 violent crimes is expected for each additional probationer on residential

blocks. Based on the analysis performed, probation is still important in accounting for variation in crime across the residential blocks in 2001. Finally another MESS model was computed using violent crimes in 2001 with only the control variables to obtain the unique variance of probation which was 5.9%.

Table 9c. MESS Results Probation in 2000 on Crimes in 2000: Cross-Sectional Results

Variable	Semi Standardized B	b
Constant		.721
Violent Crime 2000	.381*	.362*
Property Crime 2000	1.018*	.477*
% Prim.Ind<65	.018	.001
% Fem. Hd	.160*	.014*
Vacancy Rate	.034	.004
% Own Oc.	.001	.000
% >65	-.078*	-.006*
% Black	.493*	.018*
% Hispanic	.028	.002
% Mul. Res	.090*	.063*
Ln(House Val)	-.080*	-.091*
#Comm. Parcels	-.143*	-.009*
Population Density	-.013	-.001
Population	.806*	.011*
# Adj. Blocks	-.001	.000
Public Housing	.112*	1.441*
Area	-.143*	-.008*
Bars	-.022	-.114
Offsite Liquor	-.152*	-.813*
Alpha		-.042*
R-squared	.542*	
Unique Variance of Crimes	.125*	

* Statistically Significant with p at .05 or less.

Table 10a. MESS Results Violent Crimes in 2001 on 2001 Probation: Cross-Sectional Results

Variable	Semi Standardized B	b
Constant		.721
Probation 2001	.322*	.119*
% Prim.Ind<65	.023	.001
% Fem. Hd	.041*	.003*
Vacancy Rate	.017	.002*
% Own Oc.	.020	.001
% >65	.006	.000
% Black	.038*	.001*
% Hispanic	.021	.001
% Mul. Res	.046*	.032*
Ln(House Val)	-.011	-.012
#Comm. Parcels	.102*	.006*
Population Density	-.006	.000
Population	.063*	.001*
# Adj. Blocks	.038*	.015*
Public Housing	.091*	1.178*
Area	-.024	-.001
Bars	.036*	.186*
Offsite Liquor	.202*	-.122*
Alpha		-.125*
R-squared	.301*	
Unique Variance of Probation	.059*	

* Statistically Significant with p at .05 or less.

The MESS results for regressing property crimes in 2001 on probation in 2001 are presented in Table 10b. The R-squared of .336 is statistically significant and accounts for 36% of the variance in the number of property crimes on residential blocks. Once again, the effect of probation in 2001 is statistically significant and probation has the largest standardized coefficient and, therefore, it is the most important independent variable accounting in the number of property crimes across the blocks in 2001. The unstandardized coefficient indicates that an additional .156 property crimes is expected for each additional probationer on residential blocks. Using the results of a secondary MESS model for property crimes in 2001 with only the control variables as independent variables yields the unique variance of the probation which was 5%.

Table 10c presents the results of a MESS model of probation in 2001 on both violent and property crimes in 2001. An R-squared of .477 is statistically significant and accounts for 48% the variance in the number of probationers on residential blocks. Violent and property crimes are statistically significant. Property crimes in 2001 had the second largest standardized coefficient, violent crime in 2001 has the fourth largest standardized coefficient. The unstandardized effects from this MESS model indicate that an additional .463 probationers can be expected on a residential block for each additional violent crime that occurs on a residential block and an additional .282 probationers can be expected for each additional property crime that occurs on residential blocks. Finally another MESS

model was computed using probation and control variables only to obtain the unique variance of the two crime measures which was 5.8%.

Table 10b. MESS Results Property Crimes in 2001 on 2001 Probation: Cross-Sectional Results

Variable	Semi Standardized B	b
Constant		-.221
Probation 2001	.422*	.156*
% Prim.Ind<65	.050*	.003*
% Fem. Hd	.056*	.005*
Vacancy Rate	.043*	.006*
% Own Oc.	-.062	-.002*
% >65	.029	.002
% Black	.010	.000
% Hispanic	-.006	.000
% Mul. Res	.074*	.052*
Ln(House Val)	.005	.006
#Comm. Parcels	.142*	.009*
Population Density	-.011	-.001
Population	.184*	.003*
# Adj. Blocks	.060*	.023*
Public Housing	.028	.360
Area	.032	.178
Bars	.034*	1.340
Offsite Liquor	.250*	-.192*
Alpha		-.125*
R-squared	.336*	
Unique Variance of Probation	.049*	

* Statistically Significant with p at .05 or less.

Table 10c. MESS Results Probation in 2001 on Violent and Property Crimes in 2001:Cross-Sectional Results

Variable	Semi Standardized B	b
Constant		1.168*
Violent Crime 2001	.439*	.463*
Property Crime 2001	.635*	.282*
% Prim.Ind<65	.047	.003
% Fem. Hd	.161*	.014*
Vacancy Rate	.058*	.007*
% Own Oc.	-.130*	-.004*
% >65	-.054*	-.004*
% Black	.447*	.017*
% Hispanic	.115*	.008*
% Mul. Res	.166*	.116*
Ln(House Val)	-.098*	-.112*
#Comm. Parcels	-.114*	-.007*
Population Density	-.034	-.002
Population	1.027*	.015*
# Adj. Blocks	.000	.000
Public Housing	.025	.319
Area	-.146*	-.008*
Bars	-.008*	-.043*
Offsite Liquor	-.158*	-.846*
Alpha		-.654*
R-squared	.477*	
Unique Variance of Crime	.058*	

* Statistically Significant with p at .05 or less.

Granger Causality MESS Results

Table 11a has the MESS model results for violent crimes in 2001 on probation in 2000. This is the first real analysis which can be used to test for Granger Causality. The R-squared for this model is statistically significant at .313 and accounts for 31% of the variance in the number of violent crimes on residential blocks. Probation, which is statistically significant, had the largest standardized coefficient. This makes it the most important independent variable in this analysis. The unstandardized coefficient indicated that an additional .122 violent crimes in 2001 can be expected for each additional probationer on residential blocks in 2000. From this model, it appears that probation continues to predict crime. Using the results of a secondary MESS model, calculated for violent crimes in 2001 with only the control variables as independent variables, yields the unique variance of probation which is 9.4%.

Table 11b reports the results of regressing property crimes in 2001 on probation in 2000. The R-squared is statistically significant at .345 and accounts for 35% in the variance in the number of property crimes on residential blocks. Probation in 2000 remains statistically significant and continues to have the largest standardized coefficient in this model and be the most important independent variable. The unstandardized coefficient indicates that an additional .159 property crimes can be expected for each additional probationer crime on the residential blocks. The unique variance of probation comes from using another

MESS model with property crimes regressed on only the control variables. The unique variance associated with property crimes is 6.8%.

Table 11a. MESS Results Violent Crimes in 2001 on 2000 Probation: Granger Causality Results

Variable	Semi Standardized B	b
Constant		-.173
Probation 2000	.329*	.122*
% Prim.Ind<65	.050*	.001
% Fem. Hd	.056*	.003*
Vacancy Rate	.043*	.002
% Own Oc.	-.062	.001
% >65	.029	.001
% Black	.010	.001
% Hispanic	-.006	.002*
% Mul. Res	.074*	.035*
Ln(House Val)	.005	-.008
#Comm. Parcels	.142*	.006*
Population Density	-.011	.000
Population	.184*	.001*
# Adj. Blocks	.060*	.013*
Public Housing	.028	1.006*
Area	.032	-.001
Bars	.034*	.185*
Offsite Liquor	.250*	1.087*
Alpha		-.113*
R-squared	.313*	
Unique Variance of Probation	.094	

* Statistically Significant with p at .05 or less.

Table 11b. MESS Results Property Crimes in 2001 on 2000 Probation: Granger Causality Results

Variable	Semi Standardized B	b
Constant		-.253
Probation 2000	.430*	.159*
% Prim.Ind<65	.050*	.003*
% Fem. Hd	.054*	.005*
Vacancy Rate	.045*	.006*
% Own Oc.	-.067*	-.002*
% >65	.034*	.003*
% Black	-.005	.000
% Hispanic	-.003	.000
% Mul. Res	.080*	.056*
Ln(House Val)	.011	.012
#Comm. Parcels	.139*	.008*
Population Density	-.012*	-.001*
Population	.173*	.002*
# Adj. Blocks	.053*	.021*
Public Housing	.010	.129
Area	.034	.002
Bars	.034*	.176*
Offsite Liquor	.250*	1.343*
Alpha		-.113*
R-squared	.345*	
Unique Variance of Probation	.068*	

* Statistically Significant with p at .05 or less.

The second major part of this of analysis for Granger Causality involves reversing the roles of crime and probation as dependent and independent variables. The results of the MESS model of probation in 2001 on crimes in 2000 are in Table 11c. The R-Squared for this model is .506 and is statistically significant. This regression accounts for 50% of the variance in the number of probationers on the residential city blocks. Violent crime and property crime both have statistically significant effects. They, however, do not have the largest standardized coefficients. In the regression, property crimes has the second largest standardized coefficent and the standardized coefficient of violent crimes is the fifth largest. The unstandardized coefficients indicate that an additional .260 probationers can be expected on each block for each additional violent crime and an additional .378 probationers can be expected for each additional property crime on the residential blocks. Once again, using another MESS model permits obtaining the unique variance of both crimes. The difference between the MESS model with both crimes in it and the MESS model with both crimes omitted yields a unique variance of 10.3%.

The larger R-squared for this model makes it appear that crimes have a Granger-causal relationship to probation rather than vice versa. The regression results in Table 11c are not adjusted, however, for the potential stability in the locations of probationers. A substantial number of probationers may remain in the same locations they lived before adjudication. Also, even when probationers do move they may move to locations where other probationers lived in the past.

Indeed, the correlation between the number of probationers in 2000 and 2001 was .749. Maps of the locations of probationers by block, which are too detailed to be presented at a scale that is compatible with this thesis also show that there is a substantial stability in the locations of probationer across years.

The results in Table 11d are adjusted for the stability in the locations of probationers from 2000 to 2001. The number of probationers on each block is included as an independent variable along with the number of violent and property crimes in 2001 in the regression on the number of probationers in 2001. The size of the standardized coefficent of probation is the fourth largest in the results, violent crimes has the second largest, and property crimes has the third. The unique variance of adding the crime variables to the regression for probation in 2001 is only 1.1% ((.6202-.6095)* 100).

The unique variances of probation in 2000 on the two crime measures in 2001 comes from omitting probation from the regressions in Table 11a and 11b and then obtaining the differences in R-squares between the regressions omitting probation and the R-squares in these two tables. Adding probation in 2000 to the regressions on crimes in 2001 increases the explained variances by 9.4% for violent crimes and 6.9% for property crimes. Thus, the variances in crimes accounted for by the locations of probationers a year earlier far exceed the variances in the number of probationers across blocks accounted for by the two crime measures. These results are consistent with the locations of probationers having a Granger-causal relationship to crime.

In the regressions in Table 11a and 11b, measures of crime in the prior year could not be included as independent variables because crimes cannot commit new crimes. Only people can commit crimes. In other words, it is not possible for crime to cause crime or for a crime to remain in a place over time. Crime is an event which ends, but people, including probationers can and do stay in the same residences for extended periods of time and can move over time. After a crime has been committed, it is over, and it cannot cause crime one year later. Therefore crimes in a previous year cannot be used as an independent variable for the amount of crime on a block in a following year.

Overall, the results indicate that the locations of crimes and locations of probationers are related to each other and that the relationship is positive. More crimes occur in areas where probationers live than in areas where they do not live. Also, probationers live in areas that have more crime than in other areas in the city. The most refined analyses comes from the MESS model which accounts for spatial autocorrelation and the stability in the location of probationers. Its results suggest that the presence of probationers has stronger Granger-causal effects on both property and violent crimes than the Granger-causal effect of either or both crimes on the location of probationers.

Table 11c. MESS Results Probation for 2001 on 2000 Crimes: Granger Causality Results

Variable	Semi Standardized B	b
Constant		.645
Violent Crime 2000	.246*	.260*
Property Crime 2000	.832*	.378*
% Prim.Ind<65	.032	.002
% Fem. Hd	.164*	.014*
Vacancy Rate	.057*	.007*
% Own Oc.	-.055	-.002
% >65	-.047	-.004
% Black	.439*	.016*
% Hispanic	.065*	.005*
% Mul. Res	.149*	.104*
Ln(House Val)	-.063	-.072
#Comm. Parcels	-.1338	-.008
Population Density	-.029	-.002
Population	-.860*	.012*
# Adj. Blocks	-.020	-.008
Public Housing	.024	.306
Area	-.140	-.008*
Bars	-.012	-.065
Offsite Liquor	-.112*	-.599*
Alpha		-.059*
R-squared	.506*	
Unique Variance of Crimes	.103*	

* Statistically Significant with p at .05 or less.

Table 11d. MESS Results Probation in 2001 on 2000 Crimes and Probation: Granger Causality Results

Variable	Semi Standardized B	b
Constant		.311
Violent Crime 2000	.443*	.468*
Property Crime 2000	.340*	.154*
Probation 2000	.245*	.091*
% Prim.Ind<65	.024	.001
% Fem. Hd	.090*	.008*
Vacancy Rate	.041	.005
% Own Oc.	-.057	-.002
% >65	-.011	-.001
% Black	.209*	.008*
% Hispanic	.053	.004*
% Mul. Res	.108	.075*
Ln(House Val)	-.025	-.029
#Comm. Parcels	-.066*	-.004*
Population Density	-.023	-.002
Population	.484*	.007*
# Adj. Blocks	-.021	-.008
Public Housing	-.030	-.383
Area	-.073*	-.004*
Bars	-.002	-.013
Offsite Liquor	-.041	-.219
Alpha		-.036*
R-squared	.620*	
Unique Variance of Crimes	.011*	

* Statistically Significant with p at .05 or less.

Chapter V

Conclusions and Discussion

Conclusions.

There has been no prior research that has examined the relationship between the locations of probationers and the locations of crimes. For this research, it appeared that the location of probationers was related to the amount of crime in an area and also that probationers tended to locate in high crime areas. The first effect however, appeared to be stronger. These conclusions are based on the results of findings from several statistical analyses which are summarized below.

Two t-tests for the difference of means were performed on blocks with and without probationers in 2000 and 2001. The difference between residential blocks with probationers and without probationers was substantial. In 2000 and 2001, blocks with probationers had an average number of both violent and property crimes that were two to three times larger than the average than on blocks without probationers.

Ordinary Least Squares (OLS) regression was used to control the effects of the number of probationers for the effects of other characteristics of the blocks and to provide a baseline for comparison with the results of a more sophisticated technique. The results of OLS regressions revealed that probation had statistically significant effects and that it had the largest standardized effect for both 2000 and 2001. These findings meant that it was the most important independent variable

accounting for variations in crime across the residential blocks in both years. The OLS results provided substantial evidence that probation had the strongest effect on both violent and property crimes.

To find out if probation affected the number of crimes in residential areas or vice versa, tests for Granger Causality were used. The R-squared for each Granger-type regression was statistically significant and, in fact, the R-squared predicting crime in 2001 was larger than for 2000. Probation in 2000 and 2001 had statistically significant effects on violent crimes and modified property crimes in 2000 and 2001, therefore the regression appeared to indicate that probation had a Granger-causal relationship to violent and property crimes. These results however, were not adjusted for spatial autocorrelation.

Each of the Maximum Exponential Spatial Specification (MESS) models which adjusted for spatial autocorrelation had statistically significant effects for probation, violent crimes, and property crimes. Probation had the largest standardized coefficient throughout the MESS analyses. Based on these findings, secondary MESS models were calculated to obtain unique variances. Probationers' effects on crimes and the effects of the locations of crimes on the locations of probationers were obtained from these models. These models demonstrated that probation was three times more important in accounting for the explained variance of crimes in 2001 than were the two measures of crime in 2000 for explaining variance in the 2001 MESS model for probation after controlling for the number of probationers in 2000. The two crime measures

accounted for only 1.1% of the variance in the number of probationers in 2001 after adjusting for the stability in the locations of probationers. The number of probationers on the blocks in 2000 accounted for 9.4% of the variation in the number of violent and 6.8% of the variation in property crimes in 2001. These were the unique variances for probation on both crimes in 2001.

Discussion.

Although there were limitations to my study which will be discussed later, it did have several strong points. The first was that this was the first ever examination of the relationship between the location of probationers and crime using city blocks. Second, I was able to use all residential blocks in the city while adjusting for spatial autocorrelation. Finally, this research extended individual-level theories into the analysis of crime patterns across areas as will be discussed below.

The theory of low self-control argued that individuals with low self-control would be more likely to commit criminal offenses (Gottfredson and Hirschi, 1990: 91). Probationers have already demonstrated that they had problems with low self-control because they were already sanctioned by the criminal justice system. Based on the results of this study, it appeared that residential city blocks with probationers had substantially more crime than blocks without probationers. Residential blocks with probationers had more violent and property crimes then did blocks without probationers in 2000 and 2001. This finding was consistent with an extension of self-control theory to the residential

locations of probationers. Areas, in this case, city blocks, which have more individuals who have demonstrated low self-control in the past, i.e., probationers, had more crimes than areas with fewer or none of these individuals. Whether or not it is the probationers or their associates or others committing crimes on these blocks could not be determined by this research. Even after adjusting for spatial autocorrelation, probation remained stronger than any other variable for predicting crime on residential blocks.

Routine Activity Theory argued that, for a crime to occur, three elements had to be present: a motivated offender, a target, and the absence of capable guardians (Cohen and Felson, 1979: 589). From Routine Activity Theory, it was reasonable to expect that places with a greater number of individuals who have offended in the past will have more crime. Since probationers have offended in the past, it is reasonable to expect that probationers had the potential to re-offend. Presumably probationers returned to the same homes in which they lived in before being sentenced. This means that they could still have associates that resided in the same areas or could have attracted old friends, who were also offenders to their residential areas. Even though probationers may not have committed criminal offenses themselves, their presence may have drawn in other offenders who might have committed crimes in the areas where probationers resided. The results of this study indicated that in 2000 and 2001, these processes or some other conditions on the blocks that could be related to the presence of

probationers led to crimes. The large number and wide variety of other control variables reflecting demographic, housing, and land use characteristics served to eliminate, at least in part, the effects of several other potential causes of crime. While the explained variances were substantial for units of analysis as small as city blocks, no model completely accounted for all the variation in crime. On, the other hand, crime has more causes than can be identified by only the characteristics of city blocks. The sizes of the explained variances are very similar to those found for other crime research (Roncek 1981; Roncek and Faggiani, 1985; Roncek and Pravatiner, 1983). Throughout the analyses, the number of probationers on residential blocks was positively associated with the number of crimes occurring in an area.

No support was found for hypotheses derived from life course theory which was an alternative theory that when extended would have predicted a negative relationship between the number of probationers and crimes on residential city blocks. The main focus of life course theory was based on trajectories, transitions, and the interactions, which created life changes for individuals (Sampson and Laub, 1993: 8). The extended argument implied viewing probation as a potential transition which could have led to a life turning point because of the avoiding of incarceration. The expected responses of probationers from this viewpoint would have been desistence from offending and avoidance of any persons or situations which could have led to additional involvement in crime. Also, probationers in turning away from crime might have

provided additional guardianship as a precautionary measure to deter crimes from being committed on their blocks by others and then being blamed for these crimes. The effects of the number of probationers on residential blocks on crimes in these areas however, were positive and statistically significant in every type of analysis undertaken. These findings have required rejecting the hypothesis derived from this theory

Another alternative explanation which would have led to the positive relationships between the number of probationers and the number of crimes can be constructed from combining routine and life course theories. If, as a result of "being given a break" probationers overwhelmingly abstained from the social life on their residential blocks then this abstinence could have substantially lowered the levels of guardianship in these areas and consequently allowed more crime to have occurred than on blocks without or with fewer probationers. The alternative explanation, however, would have required the assumption that those who in the process of participation in social activities in the past, committed offenses would by-and-large have stopped engaging in virtually all social activities in their residential areas. This assumption, although it could not be tested with these data, seems not to be a plausible explanation of the consistent results found by this research.

The most general explanation for these findings is that levels of social control were lowered and/or opportunities for crimes were greater on the residential blocks on which probationers lived. While the stronger results

indicated that the presence of probationers affected the amount of violent and property crimes there also was a statistically significant effect of crimes on the locations of probationers. Not only did the locations of probationers appear to affect crimes, but probationers also tended to locate in higher crime areas.

This study brought one class of offenders into examination of urban crime patterns conducted from a Routine Activity Theory perspective (Roncek 1981, Roncek and Maier, 1991). This was an advance over much urban crime research. Typically offender data are not used in studies of ecology of crime. The results supported the importance of including measures of offenders in urban crime studies. It appears that the presence of probationers had a stronger Granger-causal effect on the amount of crimes then crimes had on probation.

The results of this research suggest that monitoring the residential locations of relatively large numbers of probationers, in particular, would be potentially useful for crime prevention and apprehension efforts. They also suggest that efforts at decreasing the concentration of probationers in relatively high crime areas could be important for decreasing their involvement in additional illegal activities.

Research Implications

This study has provided a baseline for future research. There remained five areas that should be addressed in future research. First, because there was no prior research in this particular area, there was no justification for using specific

categories of probationers, such as individuals on probation for Driving Under the Influence of Alcohol (DUI) or drug offenses. Second, I was unable to determine whether any of the probationers in this study were under electronic monitoring. Third, there was no way to identify the time differences between when probationers move in and when crimes occur. Fourth, I only used the city of Omaha, Nebraska, but its demographics have continued to be a mirror of the United States population. Fifth, A Poisson/Negative Binomial Regression could not be executed because currently there is no computer program that will run Poisson/Negative Binomial Regression and correct for spatial autocorrelation. Finally, areas completely occupied by group quarters, such as hospitals and assisted living residences were excluded because they did not have housing values. In addition, substantial amounts of data for other characteristics of these blocks were missing.

A much more complete research design is needed -one which follows probationers over time, examines arrests and arrestees, and crimes from year to year. It would be beneficial to take probationers and separate them into categories based on their offense, such as Driving Under the Influence of alcohol (DUI) and offenders who received probation as a plea agreement. It may also be important to look at juveniles who are on probation because they are in the age range most likely to re-offend; plus, that have the added guardianship of their parents. This study, however, has provided a starting point for future research on the relationships of offenders in the community and crime.

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