

APPLICATION OF THE CONCENTRIC ZONE THEORY OF CRIME  
TO SAN ANTONIO, TEXAS

THESIS

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By

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## ABSTRACT

This thesis covers the concentric zone theory of crime as it applies to the city of San Antonio, Texas. Contributions of Burgess and Shaw and McKay are detailed as well. It is hypothesized that the crime rates of the different zones in San Antonio will generally adhere to Shaw and McKay's concentric zone theory, which means that crime rates are expected to decrease the further one moves away from the center of the city. Empirical comparisons of the crime rates for each zone are also provided.

## CHAPTER I

### INTRODUCTION TO THE STUDY

Throughout history, researchers have offered a great many theories to explain why individuals engage in criminal activity. In the Middle Ages, the predominant belief was that criminal behavior was the result of supernatural forces. Since that time, the theories of demons and spirits have been replaced by theories that attempt to explain criminal behavior from varied perspectives. Some theorists attribute criminal behavior to biological factors, while others attempt to explain it from a psychological point of view (Sheley, 1995).

Both biological and psychological theories blame delinquency on factors *within* the individual. People, not society, are blamed for the crime problem. This view of crime was challenged early in the twentieth century when sociological theories began to emerge. These theories suggest that crime, like other social behavior, is a product of social forces – particularly a product of faulty cultural and social arrangements. The first group of theorists to voice this idea were members of the “Chicago school” of sociology. (Regoli and Hewitt, 1997, p.172)

The work of sociologists from the University of Chicago in the 1920s and 1930s focused on the social factors which influenced delinquency. Delinquency was seen as a consequence of rapid social change, which weakens community and social controls on children. This in turn produces neighborhoods characterized by high rates of crime in which delinquent traditions flourish (Regoli and Hewitt, 1997).

According to the Chicago school of thought, one cannot understand social life without understanding the “arrangements of particular social actors in particular social times and places. No social fact makes any sense abstracted from its context in social (and often geographic) space and social time. Social facts are located facts” (Abbott, 1997, p.1152).

Theoretical concerns of crime and place focus on how place might be a factor in crime, either by influencing or shaping the types and level of criminal behavior by the people who frequent an area, or by attracting to an area people who already share similar criminal inclinations. The study of the relationship between crime and place traces back to the work of early French social ecologists during the mid-nineteenth century. Guerry and Quetelet were interested in explaining the differences in community crime levels in terms of varying social conditions of the resident populations. The works of Guerry and Quetelet are among the earliest examples of the types of empirical research that fall within the tradition of the ecological studies of crime. That is, studies in which the units of analysis are spatially defined population aggregates (Anselin, Cohen, Cook, Gorr and Tita, 2000).

Ecological theories look for explanations of individual actions in general features of the social structure in which the individual is embedded. Place-based theories fall within the theoretical tradition of social ecology, but they are more specific about the mechanisms by which structural context is translated into individual action (Anselin et al., 2000). One of the more modern place-based theories of crime is the routine activities theory first introduced by Cohen and Felson (1979). Where the

older crime-place theories were fairly generalized, not accounting for the actions of the individual, the routine activities theory takes a more scientific approach to explaining deviant behavior.

Place is central in the routine activities perspective, serving as the locus where motivated offenders come in contact with desirable targets in the absence of crime suppressors. The convergence of crime opportunities in space and time is facilitated by various situational features, both physical and social, which provide a context or setting that is more or less conducive to crime (Clarke, 1992). According to routine activities theory, place can facilitate (or inhibit) crime in two ways.

First, the physical or built features of a place can decrease the social control capacities of various suppressors. For example, it has been suggested that highrise housing increases population density, but because residents live vertically, they are physically removed from monitoring activities in public spaces, especially those at street level. These conditions leave this type of housing with relatively few place managers who will monitor and control public behavior and seriously limit the levels of informal social control exercised over all forms of disruptive behavior from minor incivilities to more serious illicit activities. Second, aside from the physical features, crime at places is apparently influenced by the routine activities that occur there. Crime is not distributed evenly or randomly over space. Instead, higher levels of crime plague places with some types of facilities and not others. In some places, crime seems to be elevated by a target rich environment - for example, thefts of 24-hour convenience stores. Other places seem to be prone to higher levels of crime because of the types of people they attract and repel. Places with abandoned buildings or rundown housing with absentee owners are attractive to illicit drug dealers who are looking for places where they can establish stable marketing locations without fear of owner or neighbor complaints. (Anselin et al., 2000, pp. 200-221)

As demonstrated by this description of routine activities theory, studies of the relationship between crime and place have evolved since their period of popularity in the early twentieth century. However, it was the empirical research by sociologists of

the Chicago school that provided the basis for these later studies. Chicago sociologists suggested that crime was a social problem, not merely the result of a defect on the part of the individual person. Their studies may appear to some degree less sophisticated than some of the more recent studies, but they continue to be the foundation for research into the relationship between social structure and crime. As quoted earlier, “no social fact makes any sense abstracted from its context in social (and often geographic) space and social time. Social facts are located facts” (Abbott, 1997, p.1152).

This study is based to some extent on the research of Clifford Shaw and Henry McKay. In studying juvenile delinquency in Chicago during the early part of this century, Shaw and McKay found that male juvenile delinquency rates conformed to a circular pattern around the city center. This pattern represented an inverse relationship, where juvenile delinquency rates decreased as distance from the city center increased, and they attributed this phenomenon to what they termed *social disorganization*. Although the primary focus of their research was juvenile delinquency, they also studied the distribution of young adult offenders and found that crime rates for this class of offender followed the same general pattern as that of juvenile offenders (Shaw and McKay, 1942).

Shaw and McKay conducted further similar studies of patterns of male juvenile delinquency in a number of American cities. Their methods have also been borrowed by other researchers since they published their findings, and similar results have been found. San Antonio, Texas, has not been the subject of any known research studies

similar to that of Shaw and McKay. While a complete replication of Shaw and McKay's study would be quite lengthy, this researcher feels that a preliminary study of the spatial distribution of crime rates in San Antonio would be of interest. Partly, this interest stems from the fact that Shaw and McKay's research was conducted in cities where the majority of residents were non-minority, and they partially attributed higher crime rates near the city center to a higher minority population in those areas, regardless of what that minority might have been. San Antonio, however, has a 65% minority population, so percentage of minorities might be less of an issue (Bureau of the Census, 2001). This research will focus on the geographical distribution of adult incidents of homicide and robbery in San Antonio, Texas, with the city divided into concentric zones as in the research of Shaw and McKay. The intention is to provide a basic picture of crime rate distribution in the city to determine if the subject warrants further research.

## CHAPTER II

### THE INFLUENCE OF ERNEST BURGESS' CONCENTRIC ZONE THEORY

Many important studies were conducted by individuals affiliated with the University of Chicago. Frederick Thrasher studied play groups and delinquency, Edwin Sutherland articulated the process by which children become delinquent, and Walter Miller examined the family structure of the lower class. Two of the more prominent Chicago sociologists were Clifford Shaw and Henry McKay. They developed an approach to delinquency that coupled both social-psychological and environmental factors. Like the other early theorists, their focus was on male delinquency. Shaw and McKay never claimed to be first to investigate the geographical distribution of juvenile delinquency. In the introduction to their 1942 volume, Juvenile Delinquency and Urban Areas, they credit the spatial work of European criminologists, especially in France and England. They also credit the American research of Breckenridge and Abbot (1912), Blackmar and Burgess (1917) and McKenzie (1923) preceding their first major report in 1929 (Bursik and Webb, 1982).

In the course of their research, Shaw and McKay discovered that delinquency rates conformed to the zonal hypothesis idea proposed by another Chicago criminologist, Ernest Burgess, in his 1925 paper "The Growth of the City." Burgess

proposed the hypothesis that cities naturally become organized into five concentric circular zones: (1) the Central Business District; (2) the Zone in Transition; (3) the Zone of Workingmen's Homes; (4) the Zone of Better Residences, and (5) the Commuters' Zone. Burgess, and later Shaw and McKay, found the second zone, which they termed the Zone in Transition, to have the *greatest concentration of causes* of poverty, bad housing, juvenile delinquency, family disintegration, and physical and mental disease.

#### Explanation of Burgess' Concentric Zone Theory

According to Burgess, the most desirable, and therefore expensive, land values were at the point where lines of transportation converged. This was usually in the center of the city where, owing to access to these lines, most of the commercial activities of a city were concentrated. In anticipation of the physical growth of this central business district, real estate speculators would purchase relatively inexpensive land directly surrounding the area in hopes of significant future profits. Since the maximization of profits is generally simultaneous with minimization of costs, these speculators spent very little money for the upkeep of this property. As a result, the housing units in this area were usually in a state of disrepair and had relatively low rental and property values. Therefore, the areas immediately surrounding the central business district were the least attractive in the city and, due to their relative low cost, functioned as the typical initial area of residence for immigrant ethnic groups (Bursik and Grasmick, 1993).

As immigrant groups became more fully integrated into the economic

structure, they were assumed to move progressively outward from the central city into more attractive and more expensive housing. Areas that were least attractive (close to the central business district) tended to be characterized by high rates of population turnover, as residents moved out of them as soon as economically feasible. In addition, since this rapid transition made it difficult to form strong formal and informal linkages among the residents, it was very difficult to control the movement of unwanted new residents into the area. Therefore, these areas were also characterized by relatively high rates of population heterogeneity (Bursik and Grasmick, 1993).

In terms of how Burgess' zonal model pertains to the research of Shaw and McKay, there seems to be a common misperception in much criminological literature that Zone II, the Zone in Transition is generally supposed to have the highest rates of crime. Shaw and McKay, however, make it clear that Zone I should typically have the highest crime rates, followed by Zones II, III, IV, and V. Once again, according to Shaw and McKay, the second zone seems to typically have the greatest concentration of factors thought to generally contribute to higher crime rates. They explained that Zone II contained railroads, stockyards, and industry, which made it the least desirable but also the cheapest. Therefore, people naturally gravitated toward this area if they were poor. They also found that delinquency / crime rates remained stable regardless of the race or ethnicity of the people who lived in the neighborhood (Bursik and Webb, 1982).

#### Criticism of Burgess' Concentric Zone Theory

A notable criticism of Burgess' hypothesis was that it did not fit all cities.

Schnore (1963) offers that Burgess originally conceived his zonal hypothesis as a growth model which dealt with the *process* of urban structural development and not as a static or cross-sectional representation of urban spatial structure. Consequently, socioeconomic structure of urban areas must be viewed as a process, in constant change, and the trend is the important variable to contend with, not only for the validity of Burgess' theory, but for understanding the development of organizational form in the urban community regardless of the form (Haggerty, 1971).

Since Burgess' hypothesis was first proposed, it has been both widely approved and severely criticized by sociologists. It has been declared valid by some, when applied to the cities of Chicago, Long Beach, Montreal, and Rochester; and it has been accepted by many as a valuable frame of reference for interpreting a variety of urban data - crime, dance halls, delinquency, dependency, family organization and disorganization, gangs, mental disorders, population composition, religious institutions, suicide, and vice. In contrast to those who accept and approve the Burgess hypothesis, several sociologists have spurned it as worthless, and a few have branded it as false. (Quinn, 1940, p. 210)

## CHAPTER III

### THE RESEARCH OF CLIFFORD SHAW AND HENRY MCKAY

Despite the controversy surrounding Burgess' theory, it was influential in future research on the relationship between urban structure and crime. As previously mentioned, Shaw and McKay found in their research that the distribution of juvenile delinquents in space and time follows the pattern of the physical structure and the social organization of the American city. Shaw and McKay sought to interpret the spatial distributions within a general macroscopic theory of community processes. It was this important empirical / theoretical synthesis that gave Shaw and McKay's research its significance. Broadly stated, they proposed that the spatial distribution of delinquency in a city was the product of larger social and economic processes characterizing the history and growth of the city and of the local communities which comprise it (Bursik and Webb, 1982).

Burgess and Bogue (1964) described the methods employed by Shaw and McKay as ingenious yet simple. If the trend in a city's growth is from the center to the periphery, there will be two consequences. The first is that physical deterioration of residences will be highest around the central business district, lower around the periphery of the city, and intermediate in between. Correspondingly, social disorganization will be highest in the central zone, lowest in the periphery, and

moderate in the middle zone.

For the majority of cities studied, concentric zones were set up by arbitrarily marking off distances from one to two miles. Delinquency rates were calculated by taking for each zone the ratio of official juvenile delinquents to the population of juvenile court age. Their findings were surprisingly uniform in every city. The higher rates were in the inner zones and the lower rates were in the outer zones. Also surprising was that for all but three cities (Omaha, Birmingham, and Boston) for which zonal ratios were calculated, the rates declined regularly with progression from the innermost to the outermost zone (Shaw and McKay, 1942).

In the cities, particularly Boston, that did not follow the expected pattern, Shaw and McKay offered the explanation that radial expansion of the city out to the periphery is only one of the factors affecting the physical structure of the city and the consequent effectiveness of its social organization. Other factors they offered as important were topography, street plan, railway and rapid transit lines, early location of industry, and the types of earlier settlements later annexed to the growing city (Shaw and McKay, 1929).

Juvenile delinquency was shown to be highly correlated with a number of separate factors, including population change, poor housing, poverty, foreign born individuals, tuberculosis, adult crime, and mental disorders. The correlation of juvenile delinquency was so high with each of these factors individually that if any of them were considered separately from the others, it might be deemed the chief factor in juvenile delinquency. Shaw and McKay felt that if juvenile delinquency was highly

correlated with each of those factors, then all of them must be more or less intercorrelated. Therefore all of these factors, including juvenile delinquency, could be considered manifestations of some general basic factor. The term they used to describe this basic factor was *social disorganization*, or the lack of organized community effort to deal with these conditions (Shaw and McKay, 1942).

In its purest formulation, social disorganization refers to the inability of local communities to realize the common values of their residents or solve commonly experienced problems. Population turnover and heterogeneity are assumed to increase the likelihood of disorganization for the following reasons: (1) Institutions pertaining to internal control are difficult to establish when many residents are uninterested in communities they hope to leave at the first opportunity; (2) The development of primary relationships that result in informal structures of social control is less likely when local networks are in a continual state of flux; and (3) Heterogeneity impedes communication and thus obstructs the quest to solve common problems and reach common goals. (Bursik, 1988, p.521)

#### Criticism of Shaw and McKay's Research

Like Burgess, the research of Shaw and McKay met with a fair degree of criticism, even though it had been consistently found in future studies that official rates of delinquency decline as one moves outward from the center of the city. For example, the term "social disorganization" has been rejected. Critics claim that neighborhoods where delinquency flourishes are not disorganized, but rather organized for the pursuit of criminal purposes. Shaw and McKay also received criticism on the grounds that their theory: (1) minimized the importance that ethnic and cultural factors play in delinquency; (2) is specific to a particular historical period; (3) does not account for non-delinquency in high-delinquency-rate neighborhoods; (4) is not clear on whether delinquency areas produce delinquency traditions or simply attract

delinquent people, and; (5) may overstate the case for the specialization of delinquency (Regoli and Hewitt, 1997).

There are several other criticisms of Shaw and McKay's social disorganization concept which have likely contributed to the decline in its use. Bursik and Grasmick (1993) explain that a source of confusion concerning social disorganization is the fact that Shaw and McKay sometimes did not clearly differentiate the presumed outcome of social disorganization, such as increased rates of delinquency, from disorganization itself. This tendency led some to equate social disorganization with the phenomena it was intended to explain.

Bernard Lander (as cited in Bursik and Grasmick, 1993) concluded that the value of the social disorganization construct was dubious in view of the fact that social disorganization itself had to be defined as a complex group of factors in which juvenile delinquency, crime, broken homes, and other socio-pathological factors are included. Thus, he defined delinquency as social disorganization. Shaw and McKay were not totally responsible for the confusion, as it has been pointed out that classic disorganization theorists of sociology often used a single indicator, such as a delinquency rate, as both an example of disorganization and something caused by disorganization.

Gibbons and Jones (1975) felt the social disorganization approach was subjective and judgmental while it masqueraded as an objective conceptual framework.

Social disorganization seems almost as subjective as social pathology. In social disorganization perspective, pathology was simply applied to the group instead of the individual. No longer were persons pathological; communities were now disorganized. The designation of phenomena as deviant, and the equation

of deviance with disorganization, were the focus of the sociological analyst or observer. Social disorganization was usually thought of as something “bad,” and what was bad was often the value judgment of the observer and the members of his or her social class or other groups. (Gibbons and Jones, 1975, p. 19)

Traub and Little (1994) describe Shaw and McKay’s description of social disorganization near a city’s center as suffering from circular reasoning. The lower class has the most deviants because it is the most disorganized, and it is the most disorganized because it contains the most deviants. They argue that if the lower-class does contain the most deviants, it may be for reasons other than social disorganization. Clinard and Meier (1995) contend that social disorganization implies the disruption of an existing condition of organization, a situation that generally cannot be established. Social change was often confused with social disorganization, and little attention was paid by social disorganization theorists as to why some community changes are disorganized and others are organized.

A final criticism comes from the ambiguity of the term “disorganization.” What may seem like disorganization may actually be highly organized systems of competing norms and values. Many subcultures of deviant behavior, such as youth gangs, organized criminal syndicates, prostitution, political corruption, and corporate crime are highly organized. Whyte (1943) found that even the norms and values of the slums are highly organized. In instances such as these, Schull (1988) felt that social disorganization theorists often described not disorganization but diversity, which reflected back on the ambiguity of the concept itself.

### Research Studies Supporting the Work of Shaw and McKay

Despite the criticisms of the concept of social disorganization, an important factor to consider in the spatial distribution of delinquency is that the zonal hypothesis, as originally introduced by Burgess, has shown surprising stability through the research of Shaw and McKay, as well as others studying the relationship between crime rates and urban structure. Schmid (1960) studied crime rates in relation to distance from the city center for the city of Seattle, Washington. He found a tendency for most crimes to decrease more or less in direct proportion to the distance from the center of the city. He found that among the series of offenses, embezzlement showed the most pronounced tendency to follow the centrifugal gradient pattern. Similar results were found in the study with regard to shoplifting, theft from person, rape, sodomy, and burglary, which also exhibited “striking differentials” between the central and peripheral zones. Other crimes which conformed to this pattern were homicide, assault, sex violations, larceny, fraud, and robbery.

Farley (1987) found a stable pattern to persist in the assumption that crime rates increase toward the central business district and decrease toward the suburbs. He argued that suburbanization has produced city-suburb stratification, which, in turn, produces high crime rates in the central city. It does so by concentrating poor people and minority groups who seem more prone to committing the types of crimes included in the FBI Crime Index. It also does so by creating differences in relative living standards between the city and the suburbs. White and upper-income residents typically find it easier than others to emigrate, increasing the frustration and hostility of

those left behind (Farley, 1987).

Schuerman and Kobrin (as cited in Bursik, 1988) examined, in detail, the sequence of ecological changes involved in the transition of an area from low-crime to high-crime in Los Angeles. They found that the change of the area from one of owner-occupied dwellings to one of rental units led to changes in the population composition of an area. The culmination of this process was a decrease in the prevailing controls in the area, which in turn increased the likelihood of crime and delinquency.

In the years since Shaw and McKay first published their research findings, the number of similar studies that have been undertaken should serve as an indication that regardless of whether their theory is supported or refuted by the results, it has had a significant effect on the study of crime and urban structure. Their 1942 publication, Juvenile Delinquency and Urban Areas, has been termed a magnum opus in sociological research. Twenty cities were studied, and their concentric circle model, adopted from Burgess, fit all but three of those cities (Shaw and McKay, 1942). Whatever the reason for these results, their research, coupled with the continued problem of crime in urban areas, will continue to inspire research concerning urban structure and crime.

## CHAPTER IV

### DATA AND METHODOLOGY

The purpose of this research is to determine whether crime rates vary in a predictable spatial pattern in the city of San Antonio, Texas, when studied using Burgess' concentric zone model as applied in the research of Shaw and McKay. It is expected that the crime rates of the different zones in San Antonio will generally follow Shaw and McKay's theory. First, it is expected that variations will exist between crime rates for the various concentric zones. Second, it is expected that there will be an inverse relationship between crime rates and distance from the city center, in that crime rates will decrease as distance from the city center increases.

The crime rates utilized are the rates of robbery and homicide for San Antonio, Texas, for the years 1998, 1999, and 2000. The crime rates are calculated per 100,000 in each concentric zone. Only homicide and robbery are analyzed, because an analysis of all crimes that occur in San Antonio would present an enormous undertaking. Also, homicide and robbery are utilized because they are the types of crimes the public is generally most concerned with and because such a high percentage of homicides and robberies typically are reported or come to the attention of police. Reid (2000) describes that although the rates of property crimes over the years have been much higher and fluctuated more dramatically than violent crimes, it is the

possibility of violent crime, such as homicide and robbery, that seems to arouse the most fear.

This researcher feels that the exclusion of other classes of crimes will not adversely affect the overall results of the study. Schmid (1960), as noted earlier, studied the distribution of crime rates from the city center in Seattle, Washington. He calculated rates for each class of crime separately and found that homicide and robbery, like other classes of crime, each followed the pattern of decreasing in rate of occurrence as distance from the city center increased. It should also be noted that attempted homicides and attempted robberies are not included in the data. The data reflect actual homicides and robberies.

Homicide is defined as the unlawful and unjustified killing of a human being with malice aforethought. Robbery is defined as taking personal property from the possession of another against his or her will by use of force or fear. The homicide and robbery rates will be calculated based on the number of offenses that occur in each concentric zone per 100,000 population. It should be noted that robbery rates include both robberies of individuals and businesses together.

Concentric circles are a series of circles sharing a common center. For the purpose of this research, the circles will be equidistant from each other by a distance of 1.7 miles. The resulting areas between the successive and ever-widening circles will be referred to as zones. The distance of 1.7 miles was chosen as the zone width so that as much of the city could be included in the study without going too far out of the city limits. San Antonio has expanded to the north and west to such a degree that the

center of downtown is actually south of the geographic center of the city. Expansion of the zones any farther out would have resulted in the outermost zone containing a greater area for which data would not be available, since it would be outside the city limits. Furthermore, even Shaw and McKay did not have a specific method for determining the width of the zones. It is specifically stated in their 1942 publication that they *arbitrarily* marked off distances between one and two miles, depending on the city being studied. In the case of San Antonio, a width of 1.7 miles seemed appropriate based on the location of the central business district and the geographic size of the city.

There are five concentric zones in this study, similar to those used by Burgess and later Shaw and McKay. They are similar in that they are equidistant from each other and centered on the central business district area. They differ from those used by Burgess and Shaw and McKay, because it is not known how closely the zones fit the descriptions they used when they conducted their research. For example, without knowing the specific characteristics of San Antonio, it cannot be determined if the area surrounding the downtown area fits the definition of a "Zone in Transition." For this study, Zone 1 will encompass the central downtown area, and there will be a distance of 1.7 miles from the center to the outer border of the zone. Zone 2 will have an outer border that is 1.7 miles from the outer border of zone 1 and will encompass the area that falls between 1.7 and 3.4 miles of the center of the downtown area. Zone 3 will have an outer border that is 1.7 miles from the outer border on zone 2 and will encompass the area between 3.4 and 5.1 miles of the center of the downtown area.

Zone 4 will have an outer border that is 1.7 miles from the outer border of zone 3 and will encompass the area between 5.1 and 6.8 miles from the center of the downtown. Finally, zone 5 will have an outer border that is 1.7 miles from the outer border of zone 4 and will encompass the area between 6.8 and 8.5 miles from the center of the downtown area. Thus, the total study area will fall within an 8.5-mile radius of the city center.

The number and location of all homicides and robberies that occurred and became known to the police in 1998, 1999, and 2000, has been provided by the Strategic Analysis and Mapping Unit of the San Antonio Police Department. The approximate population for each concentric zone is obtained through the use of census tract information from the U.S. Bureau of the Census for 1990, since detailed census tract information for the 2000 census is not yet available. Further information obtained from the U.S. Census Bureau for the city and for each concentric zone was average annual income, ethnicity/race, and percent renters, factors which Shaw and McKay felt corresponded with patterns of delinquency. Although they were not accounted for statistically in this study, it will be of interest to see how the percentages of these factors appear to correspond with the crime rates in each zone.

Determining the population of each concentric circle is accomplished using the Landview© III data analysis and mapping program provided by the U.S. Bureau of the Census. Landview© III provided a visual representation of the city of San Antonio, with the city divided along census tract boundaries. Using the spatial analysis function of the program, the locations of the concentric zones were placed on the map so that it

could be determined which census tracts belonged in each of the zones. The census tract numbers on the map corresponded to a database which contained the 1990 census information. Once again, the 1990 data are utilized, since the 2000 census tract data for San Antonio are not yet available. For each zone, data from the census tracts are compiled to determine the approximate population.

The number of robberies and homicides for each concentric circle is determined using ArcView GIS. ArcView is a Geographic Information System (GIS) software package that is used for the display and manipulation of digital data keyed to geographic locations. In addition to creating maps in a number of projections and scales, it can be used in more sophisticated applications to perform spatial queries and analyses based on attributes or locations and to perform address geocoding. This researcher found ArcView GIS to be very useful because of its aforementioned ability to perform spatial query and analysis functions. The particular function of ArcView GIS that was used was the trade circle analysis function. It is called trade circle analysis because it was originally designed to identify and tabulate the number of potential customers within varying distances of a business. For the purposes of this research, it is used to identify and tabulate the numbers of homicides and robberies that occurred within the five zones (See Tables I and II).

Using the trade circle analysis function, the number of robberies and homicides for each circle for each year is determined. Visual representations of this data may be referred to in Figures 1, 2, and 3. The robbery rate and homicide rate for each concentric circle for each year is calculated per 100,000 population (see Tables III and

IV) and the resulting data are analyzed using the t-test to identify significant mean differences between the concentric circles.

The t-test for significant differences among means is used because, in addition to determining if crime rates vary between the zones, the degree of statistical significance, or lack thereof, of the degree to which they vary is also determined. Analysis of Variance (ANOVA) is not used because it is not the overall level variability that is of interest here, but where the variability lies. If ANOVA had been used, it would have been necessary to perform a post-hoc test to determine which individual pairings of zones had significant mean differences. The t-test does just that, while eliminating the need for a determination of overall variability which is unnecessary for this study. The resulting t-statistics are presented in Tables III and IV.

In the case of robbery, there are significant mean differences between all pairs of concentric zones, except for the pairing of zone 3 and zone 4, and all mean

Table I

Incidents of Robbery by Concentric Zone - 1998 to 2000

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
1998	302	417	302	280	219
1999	285	383	366	292	148
2000	447	420	323	304	206

References: San Antonio Police Department, 1998; San Antonio Police Department, 1999; San Antonio Police Department, 2000; U.S. Department of Commerce - Bureau of the Census, 1992; Hohl and Mayo, 1997.

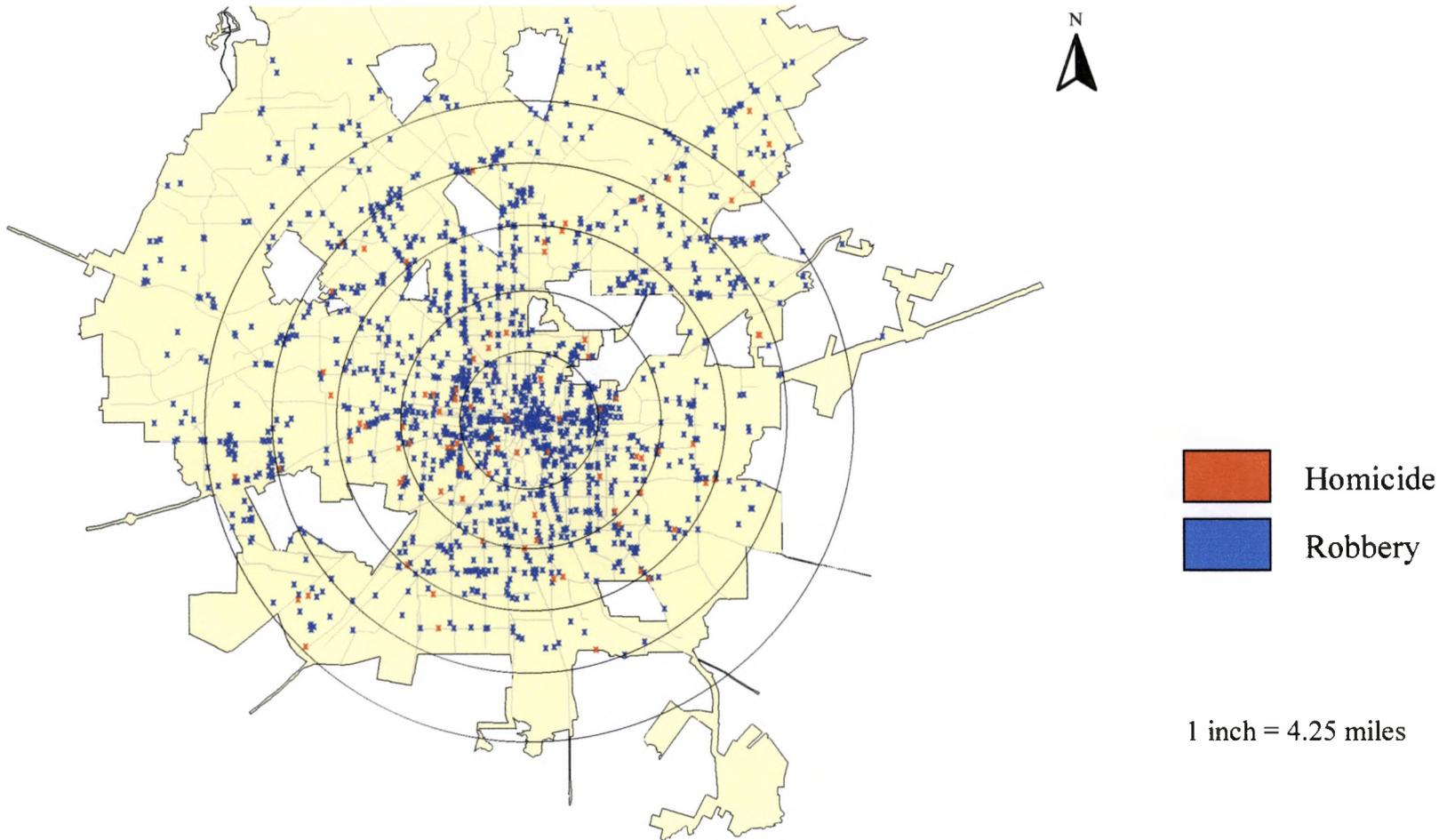


Figure 1. Distribution of incidents of homicide and robbery in San Antonio, Texas, for 1998

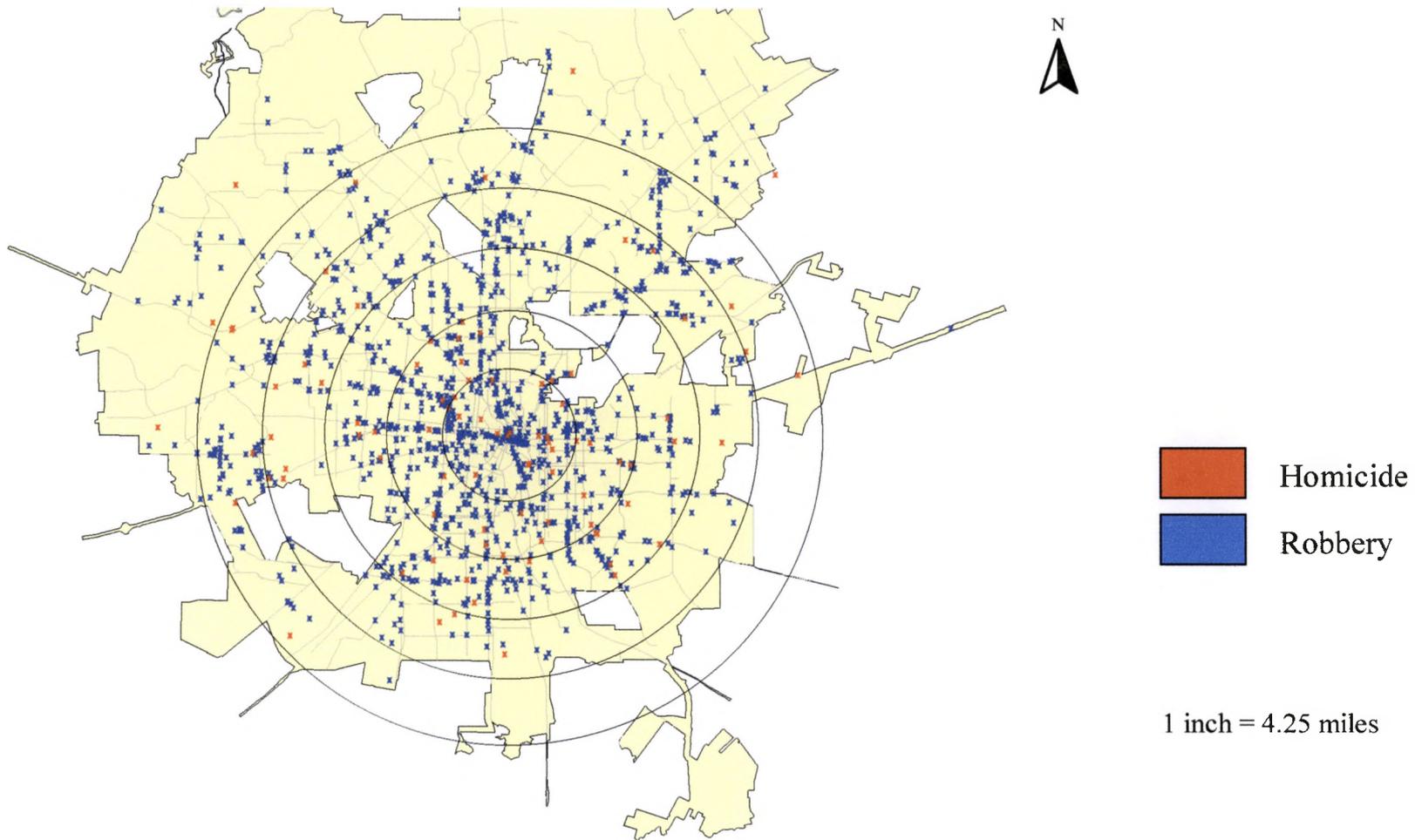
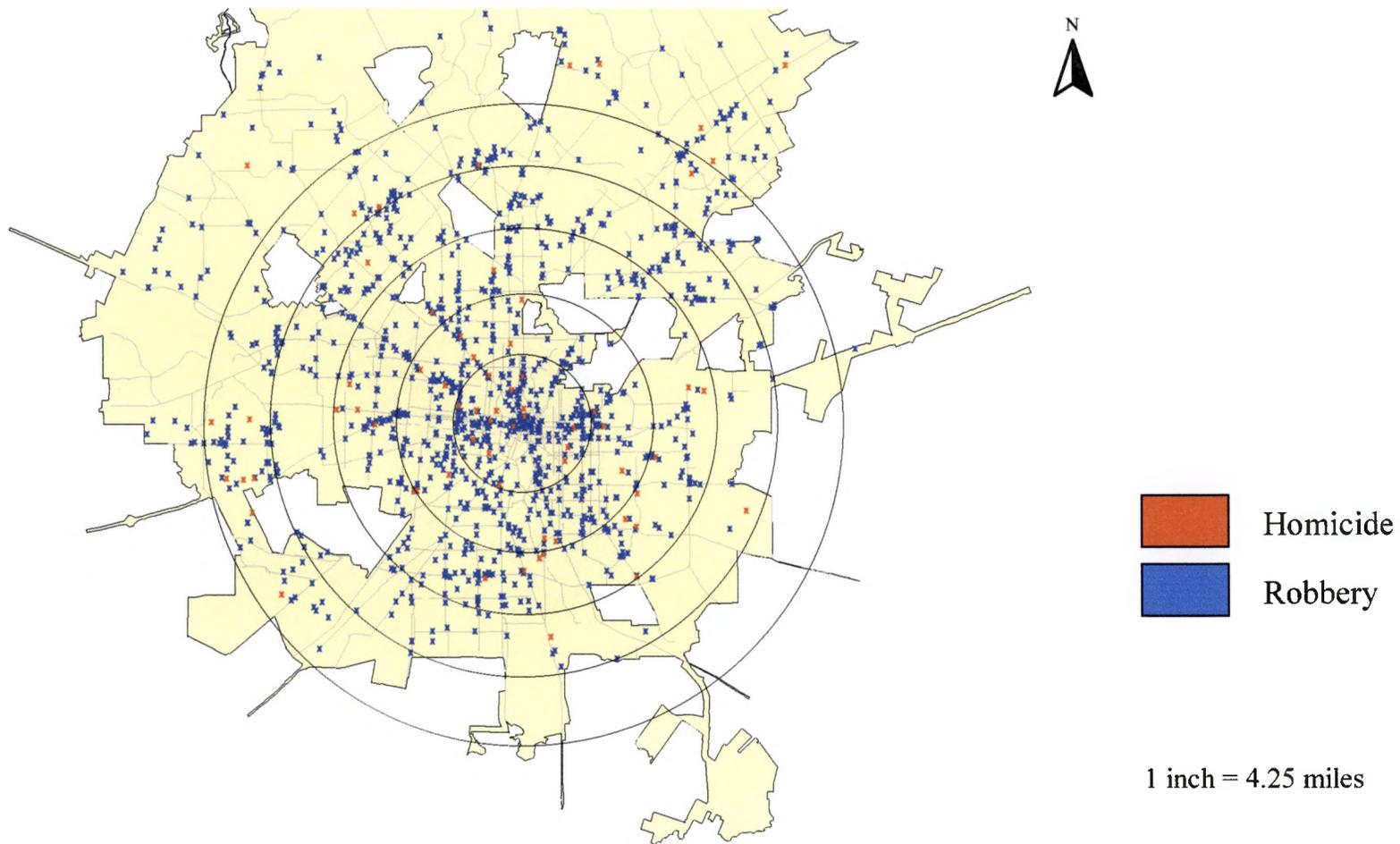


Figure 2. Distribution of incidents of homicide and robbery in San Antonio, Texas, for 1999



**Figure 3.** Distribution of incidents of homicide and robbery in San Antonio, Texas, for 2000

differences are significant at least at the .02 level (2-tailed). For homicide, significant differences are found between the pairings of zones 1 and 3, zones 1 and 4, and zones 1 and 5.

Table II

Incidents of Homicide by Concentric Zone - 1998 to 2000

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
1998	17	15	18	4	13
1999	18	26	19	16	9
2000	12	33	16	18	24

References: San Antonio Police Department, 1998; San Antonio Police Department, 1999; San Antonio Police Department, 2000; U.S. Department of Commerce - Bureau of the Census, 1992; Hohl and Mayo, 1997.

Table III

Robbery Rates per 100,000 Population by Concentric Zone - 1998 to 2000

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
1998	389.26	194.16	132.73	137.13	81.99
1999	367.34	178.33	160.86	143.01	55.41
2000	576.14	195.56	141.96	148.89	77.12

References: San Antonio Police Department, 1998; San Antonio Police Department, 1999; San Antonio Police Department, 2000; U.S. Department of Commerce - Bureau of the Census, 1992; Hohl and Mayo, 1997.

The robbery data adhere closely to Shaw and McKay's model. The number of robberies per 100,000 decrease as distance from the city center increases.

Furthermore, all but one of the mean differences are significant. The homicide data demonstrate fewer significant mean differences than the robbery data. This may be

Table IV

Homicide Rates per 100,000 Population by Concentric Zone - 1998 to 2000

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
1998	21.91	6.98	7.91	1.96	4.87
1999	23.20	12.12	8.35	7.84	3.37
2000	15.47	15.37	7.03	8.82	8.99

References: San Antonio Police Department, 1998; San Antonio Police Department, 1999; San Antonio Police Department, 2000; U.S. Department of Commerce - Bureau of the Census, 1992; Hohl and Mayo, 1997.

attributable to the fewer number of homicides compared to robberies. The lower number of homicides increases the likelihood that an unusually high or low outlier for one zone for one year will greatly affect the overall results. If the number of years being studied had been greater, perhaps the homicide data would exhibit enough stability and incidents of homicide to provide more significant differences. It should be noted, however, that although there are fewer significant mean differences with homicide than with robbery, the mean rate of homicides per 100,000 does decrease as

Table V

T-statistics Representing Differences Between Concentric Zones - Robbery

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Zone 1	--	3.83*	4.48*	4.54*	5.58**
Zone 2	--	--	4.44*	7.15**	11.95***
Zone 3	--	--	--	0.24	7.75**
Zone 4	--	--	--	--	8.60**
Zone 5	--	--	--	--	--

References: San Antonio Police Department, 1998; San Antonio Police Department, 1999; San Antonio Police Department, 2000; U.S. Department of Commerce - Bureau of the Census, 1992; Hohl and Mayo, 1997.

\* significant at .02

\*\* significant at .01

\*\*\* significant at .001

distance from the city center increases, which does generally adhere to Shaw and McKay's theory.

A further point which should be addressed is that, for the individual years being studied, there is not a consistent decrease in crime rates as distance from the city center increases. This issue will not be discussed at length for the following reasons. In the case of homicide, it has already been determined that there is little significant mean difference in the zone pairings, with the exception of zones 1 and 3, zones 1 and 4, and zones 1 and 5. In the case of robbery, there is actually a slight increase between the robbery rates from zones 3 to zone 4 for the years 1998 and 2000. Considering the trend implied by the data, these variations are small. In relation to this, the t-test,

Table VI

T-statistics Representing Differences Between Concentric Zones - Homicide

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Zone 1	--	2.52	5.03**	4.30*	4.88**
Zone 2	--	--	1.50	1.62	1.93
Zone 3	--	--	--	0.71	1.17
Zone 4	--	--	--	--	0.17
Zone 5	--	--	--	--	--

References: San Antonio Police Department, 1998; San Antonio Police Department, 1999; San Antonio Police Department, 2000; U.S. Department of Commerce - Bureau of the Census, 1992; Hohl and Mayo, 1997.

\* significant at .02

\*\* significant at .01

although not stated specifically, accounts for variations in the data within and between the zones, as can be seen in the computational formula. Moreover, it is between zones 3 and 4 that the only *insignificant* mean difference is found in the robbery data.

Earlier it was discussed that there are a number of factors which some researchers feel are correlated to the variations in crime rates between the concentric zones. They range from somewhat understandable, such as average annual income, to not easily understandable, such as mental disorders. In the course of this project, none of the factors that are alleged to have a link to crime rates was accounted for statistically, although three of them are briefly discussed. The reasons for this exclusion are as follows. Shaw and McKay found that quite a number of social phenomena could be correlated with variations in delinquency between zones.

Specifically, they found that in each of the zones there appeared to be a correlation between delinquency rates and population change, poor housing, poverty, foreign born individuals, tuberculosis, adult crime, and mental disorders, all elements of what they termed social disorganization. They may have found a correlation, but a correlation does not prove an actual relationship. Later references to this topic have researchers disagreeing in a manner similar to the “chicken and the egg” argument. There is no agreement as to whether the aforementioned factors are the result of social disorganization or the cause of it. Therefore, factors such as percentage of minorities, percentage of renters, and average annual income are not analyzed statistically because, regardless of possible strength of a correlation, they will not individually or collectively demonstrate the existence of social disorganization in San Antonio.

For the sake of discussion, percentage of minorities, percentage of renters, and average annual income are addressed in terms of how they fare across the five zones and if they, even superficially, follow the predicted pattern. In the case of minorities, which includes Hispanics, zone 1 has an 89.20% minority population, decreasing steadily to 39.01% in zone 5. Although many criminologists would contend that a higher percentage of minorities would contribute to higher crime rates, it is unclear exactly how the percentages of minorities affect the homicide and robbery rates in San Antonio. It is also interesting to note that San Antonio has an extremely high percentage of Hispanic residents, which makes the percentages of minorities seem unusually high.

For income, the average annual income for zone 1 was \$11,607, increasing to \$35,417 in zone 5. One would typically argue that that a lower annual income would generally contribute to higher crime rates, which would help make the robbery and homicide in the inner zones higher than in the outer zones. However, the extent to which annual income affects the homicide and robbery rates in San Antonio is unknown. Percentage of renters, unlike percentage of minorities and average annual income however, does not conform to a predictable pattern. Zone 1 has a 58.73% renter occupancy. This decreases to 38.04% in zone 2, increases to 41.24% in zone 3, increases again to 51.26% in zone 4, and decreases to 44.10% in zone 5. This may be attributable to the high percentage of apartment dwellers that may be found in any large city today compared to the years during which the original concentric zone studies were conducted. One would expect that a higher percentage of renters in an area would typically contribute to higher rates, since homeowners usually provide more stability than renters. Nonetheless, whether or not this is the case remains unclear, and, to further complicate matters, the percentages of renters do not follow any predictable pattern. Thus, while it is interesting to observe the percentage of minorities, the average annual income of the residents, and the percentage of renters, the effects of these individual factors on crime rates could not be ascertained either by Shaw and McKay or by this researcher.

Although the discussion of these factors is speculative at best, it is important to mention them because nothing happens in a vacuum, especially in the social arena. Social phenomena are the result of interactions at every level of society, and to take

any one of them and separate it from the context in which it occurs would be to negate its significance. There is undoubtedly a relationship between rates of crime and other social phenomena, but the exact nature of this relationship has not and, at this point, cannot be determined.

## CHAPTER IV

### CONCLUSION OF THE STUDY

The purpose of this study was to determine if the distribution of robbery and homicide in San Antonio, Texas, conformed to Shaw and McKay's concentric zone model. The results seem to give some credence to the research of Shaw and McKay and affirm stability of their theory over time. This, however, like other research inspired by Shaw and McKay, is preliminary research. Factors such as race / ethnicity, income, and percentage of renters were discussed but were not accounted for statistically. If they had been, the results may have differed. Kornhauser (1978) expounded of the difficulty of conducting such research. He argued that most delinquency theories begin with the same independent variables, especially socio-economic status. "But the variables that intervene between community structure and delinquency are at issue here and to test the theory adequately, it is necessary to establish the relationship to delinquency of the interpretative variables it implies (Kornhauser, 1978, p.82)." It is exactly the relationship that he describes whose nature has not been definitively determined.

A further factor to consider is the data itself. It would seem that to conduct a comprehensive study based on Shaw and McKay's idea, it would be necessary to have extensive information, in addition to crime rates, about the social composition of an

area. This would be difficult for the following reasons. First, it would require the cooperation of the residents, and the residents who are least likely to participate in such an undertaking are likely the ones from whom the most information is desired. Second, it would seem that, given the constantly changing nature of the social landscape, by the time the social composition of an area has been determined, it has likely changed. This does not mean that we should not continue in our quest to understand the dynamics of social interactions. It means that we cannot address social occurrences as separate, unrelated entities. We must try to understand the *process* of social change and not just the byproducts.

Reiss (1986) noted that a further hindrance to the study of social events is the reliance of researchers on government-obtained information. Governments gather very little information on the individual units for which they report their statistics. When this information is used in social research, it lacks the depth to provide information into the nature of social dynamics. So, while a study may seem accurate from a statistical and methodological standpoint, its value is only as good as the data on which it is based.

If future research does suggest a relationship between some measure of social disorganization and crime rates in San Antonio, Texas, an important issue would be how to address the problem. The phenomenon of social disorganization has so many contributing factors that any comprehensive plan to address the problem would be enormous in scope. From a criminal justice perspective, assessment could be made of the neighborhood's external community resources, as well as its position in the larger

social structure, to determine if it has the resources available to effectively combat a crime problem.

One of the first factors to consider is whether the neighborhood has the ability to influence municipal service bureaucracies and public / private decision-making agencies to allocate economic resources for crime-prevention programs. For example, a neighborhood could attempt to raise funds for the creation and maintenance of a local service agency. However, the success of such a program would be undoubtedly conditional on the ability to solicit external funding.

The second factor to consider would be the relationship that exists between the neighborhood and the police department of the city in which it is located. Bursik and Grasmick (1993) maintain that residents of a neighborhood are not only affected by the police activities occurring within its boundaries. They are affected by those occurring in other neighborhoods as well, as studies of criminal decision making have shown that potential offenders choose the area in which to commit a crime based on the differential patterns of law enforcement in a city. As a result of this, when police activities are increased in one area of the city, there may be a tendency for crime rates to increase in adjacent neighborhoods where the risks of apprehension are not so great. This suggests that the nature of police-community relations in a particular neighborhood is partly a function of simultaneous police activity in other nearby areas.

Some theorists describe the distribution of crime rates in a city as the product of complex interactions at the neighborhood level. Others simply describe these crime rates as representing the spatial distribution of individuals with particular social and

demographic characteristics. If some of these characteristics are associated with a higher likelihood of crime, and if individuals with these characteristics are more likely to live in certain parts of the city, then it may not be necessary to consider the role of neighborhood dynamics at all.

Crime has been and will continue to be an important issue in American society. How we identify the sources of the problem and address them will have an impact on the manner in which future generations live. If we continue to be reactive to the problem instead of proactive, we will only contribute to the culture of fear that can already be found in many of the larger cities. This does not mean, however, that our focus should be specifically on crime and crime prevention. It means we must acknowledge that all social phenomena are the products of complex interactions, some of which may result in criminal behavior. Our job is to try to understand these interactions and to acknowledge that these phenomena are more than the sum of their parts.

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