GIS Spatial Analysis of Multiple Scenes in Criminal Homicides

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GIS Spatial Analysis of Multiple Scenes in Criminal Homicides

by

Casey C. Anderson

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts
Department of Anthropology
College of Arts and Sciences
University of South Florida

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Dedication

I would like to dedicate this paper to my parents, Joe and Teresa Anderson, for always supporting me throughout my academic endeavors.
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GIS Spatial Comparison of Multiple Scenes in Criminal Homicides

Casey C. Anderson

Abstract

Anthropological studies of community structures and human relationships of today’s societies are becoming increasingly important for crime analysis. Law enforcement agencies are often challenged with the task of connecting multiple locations to persons involved in crimes to solve cases. Using the structures of the target communities and the social relationship between the victim and offender, spatial distributions of crimes can be reconstructed.

Data used in this analysis were collected from Hillsborough County, Florida (n=420) and Lancaster County, Nebraska (n=48) law enforcement agencies within the years 1997-2007. The hypothesis of this paper is: if the social relationship between the victim and offender affect the spatial distribution of significant locations in a criminal homicide, then by exploiting the relationship of the involved individuals, can one acknowledge the possibility of generalized spatial configurations, depending on the type of community in which it occurred? Geographic distance results are cross-referenced to the relationship of the perpetrator to the victim, and scrutinized with frequencies, chi-square tests, cross-tabulations, correlations, mean comparison, and descriptive statistics.
Results show similar frequencies of social relationship categories and the frequencies of victim and offender sex. However, the mechanism of death, victim and offender age differences, victim precipitation, and offender ancestries of domestic homicides, co-habitation cases, and distances between locations differ between the two communities. These variables’ frequencies and patterns show some variation between the two regional settings. The goal of this paper is to identify the variables, through assessing community structures and social relationships, which affect the rates of social violence.
Chapter 1

Introduction

The amount of violence in today’s society has been a main focus of analysis in many fields, including prevention and intervention for law enforcement agencies across the country. These agencies are frequently charged with the task of uncovering evidence and the circumstances surrounding criminal activities. This duty ranges from revealing associations between multiple locations to the social relationship of the individuals involved (Federal Bureau of Investigation 2004:41). Locations involved in homicides may include a variety of sites, ranging from the victim and the offenders’ residences, to the place where the crime occurred, as well as a body deposition site. How these scenes and people connect and interact can play a vital role in solving a case in a timely fashion. Anthropology is well suited for the task of uncovering the underlying social factors, such as community structure and human relationship networks, which can affect the movement and interaction of people, including violent interaction (Pool and Geissler 2005). Comparative studies allow anthropology to identify the similarities and differences between various communities, such as urban and rural structures, allowing for a more focused perspective (Gagne 1992:387). For example, if an offender kills and buries a family member, the location of the murder site, residences, and the bond between the victim and killer can play a vital role in recovering the body and solving the case.
Criminal homicide is defined as, “An exchange between a victim and an offender, within a context, that resulted in the demise of the victim” (Swatt and He 2006:279). In criminal homicide cases, the social relationships between the people involved have the potential to provide important information about the connection of scenes (Silverman and Kennedy 1987). Avakame (1998:602) adds further acknowledgement to this theory by stating, “The victim-offender relationship is crucial to unlocking the mystery of why people kill each other”. In the past, scrutinized relationships focused on strangers or “intimate”, meaning emotionally close, associations. Numerous studies (e.g., Wolfgang 1958, Wolfgang 1967, Daly and Wilson 1988, Polk 1993, Avakame 1998) have been conducted on the dynamics of relationships involved in criminal homicides, as well as analyses of the distances between relevant locations in certain crimes (Brantingham and Brantingham 1984, Messner et al. 1999, Canter 2000, Van Patten and Delhauer 2007, Grubesic and Mack 2008). However, there is a paucity of research integrating and supporting the two foci using Geographical Information System methods.

In addition, it has been established (Gastil 1971, Silverman and Kennedy 1987, Sacco et al. 1993) that the differences in homicide rates between urban and rural communities are based on the evidence of different cultural settings. Yet, a geographical spatial analysis, paired with a social relationship analysis, has not yet been attempted in the context of urban and rural communities. An urban society is characterized as a city with a large, diverse population with a great deal of immigration and residential movement (Frey and Zimmer 2001:25). Three elements of an urban area are defined by Frey and Zimmer (2001:26-27) as ecological, economic, and de-concentration. These elements refer to the population size and density, non-agriculture economic productivity,
and expanded territories due to suburban living (Frey and Zimmer 2001:26-27). Rural societies are mainly comprised of smaller, less diverse populations, little residential migration, and opposite elements as an urban area (Argent 2008). These different groups have the potential for variations in demographic and social factors that influence homicide because of the population factors surrounding them. In the current paper, a rural location from Nebraska and an urban location from Florida were chosen as the study sites. Figure 1.1. Social factors involved in homicides were explored through a comparison of spatial distributions and the social relationships of involved individuals. The researcher then deduced conclusions from the results and suggests social relationships to focus on, within specific spatial configurations, for homicide analyses.

A Geographical Information System (GIS) uses spatial information for capturing, storing, analyzing, managing and presenting information (Manhein, Listi, and Leitner 2006:171). These data are defined as “information that can be interrelated based on position” (Brantingham and Brantingham 1984:212). Geographical Information Systems allow for interactive inquiries, spatial analyses, and maps to be conceptualized and developed. Various fields such as; anthropology, resource management, city planning, criminology, and marketing, use this tool to conduct research.

Geographic Information System data represent real world objects with digital images, which can be achieved through raster or vector data (Wagner and Fortin 2005). The present geographic study utilized vector data in the analysis, which employ geometrical shapes and physical distance to express geographical features (Korte 2001). These shapes triangulate spatial distributions and distances to exact measurements, thereby computing highly accurate results to the analysis.
The purpose of this project is to use spatial analyses of various locations to determine if the relationship of a victim and offender in criminal homicides, specifically domestic, non-domestic, and stranger homicides, significantly influence the distribution of multiple scenes. It should be noted that the current paper is part of a larger on-going joint research project between the University of South Florida and Hillsborough County law enforcement agencies, also studying the spatial distribution of criminal homicides. This paper focuses on case characteristics, victim-offender demographics and relationships, as well as the spatial variations of sites found with each type of case. The intent of this project is to use the ideas and methods from past studies, and conduct them on an original dataset to suggest a new investigation strategy for faster body recovery and case closure in criminal homicides. In addition, the distributions of scenes were analyzed in the cultural context of the region in which the murder occurred. By using GIS, the areas of interest and the distances between the locations were analyzed to address this issue.

Expectations for the results of this study are:

• The relationship of the offender to the victim will significantly affect the spatial distribution of a murder. This is expected because of the close proximity of social relationships expected in domestic homicides, and the reverse for stranger homicides.

• Domestic and non-domestic homicide locations are hypothesized to occur in a smaller spatial area than locations of stranger homicides, particularly
in the situation of co-habitation between the offender and victim. This is due to the social relationships occurring within the context of the murders.

- When a homicide transpires between strangers, it is hypothesized that the spatial distribution of the different locations will have more distance from each other, particularly the body disposal site from the murder scene. This expectation is based on the assumption that the offender would not want to leave behind evidence of his offense.

- Homicides that occur in rural areas are expected to have a higher rate of domestic murder, whereas urban area homicides are expected to have a higher prevalence of stranger killings. This rationale is based on the statement by Silverman and Kennedy (1987:274) that “strangers are a real and persistent aspect of urban living”.

- Demographic data for both the victim and offender are also expected to reflect the overall demographic composition for each region. The dynamic social structures of each community are the basis for this assumption.

- Furthermore, murder-suicides are hypothesized to occur more frequently among domestic homicides. The amount of intimacy between those victims and offenders that fall into the domestic category is expected to weigh more heavily on the offender than a stranger.

This study uses the anthropological perspective of human social networks and the community structures and factors that influence murder to better understand the phenomena of homicide and the relationships of those involved (Kvamme 2003). The
use of anthropology in crime analysis is beneficial by allowing underlying social factors to emerge, such as relationships, which may contribute to the production of crime. An anthropological perspective also allows recognition of cultural differences between communities, which may lead to differential behavior. Using a holistic perspective, the social configurations of a population can be inferred and analyzed by anthropologists using spatial distributions of significant physical locations and social groups. Interactions between the various groups are also useful in determining the underlying cultural structures that can influence social conflicts and connections within the context of the community.

By using urban and rural communities in the United States for spatial comparison, a more comprehensive and rounded approach to crime analysis is conducted, while maintaining the integrity of the analysis. Complete understanding of the cultural variables that influence and affect homicides, such as social relationships and spatial distributions, allow law enforcement agencies to better comprehend the act of homicide.
Chapter 2

Literature Review

Research conducted on both relationship dynamics (Wolfgang 1967, Silverman and Kennedy 1987, Avakame 1998, Broidy et al. 2006, Barber et al. 2008) and spatial distribution in crimes (Gastil 1971, Brantingham and Brantingham 1984, Sacco et al. 1993, Snook et al. 2005, Santtila et al. 2007, Grubesic and Mack 2008) have been thoroughly conducted in the past, yet rarely has a connection of the two topics been addressed. By using an original dataset, the ideas and concepts addressed in this paper, on both social relationships and spatial distributions in homicides, are correlated using GIS techniques and statistical analyses. In addition to this approach, the study is further enhanced by anthropologically separating the social structures of urban and rural communities, and comparing the results. This section addresses the basis for this study, the selection of variables, the significance of social relationships in crime, the benefits of comparing crime rates among different societies, and the value of using spatial distributions of scenes when evaluating criminal offenses.

Basis of Study

Methods of spatial analysis have been used in a wide variety of studies to explore the patterns of criminal behavior, as well as other relevant fields that reconstruct and analyze social distributions, including socio-cultural anthropology and landscape
archaeology (Bridges et al. 1987, Messner et al. 1999, Kvamme 2003, Snook et al. 2005, Van Patten and Delhauer 2007). The groundwork for the current project is founded in the methods and concepts of previous research examples. The methods used in the present empirical homicide study are based on an approach seen in a research article written on sexual homicides in Los Angeles, California (Van Patten and Delhauer 2007). In the example, geometric spatial analyses of sexual homicides were conducted in relation to the body disposal site and the victim and assailant’s residences (Van Patten and Delhauer 2007).

The Van Patten and Delhauer (2007) study used police and medical examiner’s records to obtain data and employed GIS to graphically illustrate the geometric distributions between locations. The geometric realities of the spatial areas were also used to determine the significance of probability for a case to be closed; simpler geometries had a higher probability of being solved than more complex spatial geometries (Van Patten and Delhauer 2007). Van Patten and Delhauer (2007:1139) concluded a “vast majority of crime trips involved neighborhood trips of less than half a mile”. Interpretation of Van Patten and Delhauer’s (2007) conclusions suggest case specifics, such as spatial geometry, victimology, manner of death, and offender motivation, must be considered in determining how to best improve investigative approaches (Van Patten and Delhauer 2007:1140).

The current study expands on Van Patten and Delhauer’s (2007) methods by adding the component of social relationship between the victim and assailant to better understand location distributions and to compare domestic to stranger homicides. In addition, Van Patten and Delhauer’s study (2007) only focuses on the urban setting of
Los Angeles, whereas this research project evaluates both an urban and rural community to identify differences between social factors influencing murder.

Focusing on the spatial concepts seen in the Los Angeles study by Van Patten and Delhauer (2007), the present paper uses a similar spatial analysis design, for all criminal homicides, to evaluate relevant scene distributions. The conceptualization of the other methods and variables are founded upon the growing field of spatial analyses to analyze criminal behavior, as seen in additional research (e.g., Messner et al. 1999, Websdale 1999, Snook et al. 2005, Santtila et al. 2007).

Landmark Homicide Study

Marvin Wolfgang, a principle pioneer of modern crime analysis, was a prominent figure in the research of victim-offender relationships, particularly “stranger homicides”, and the circumstances that surround and define the crime. His book, Studies in Homicide (1967), addressed multiple issues surrounding criminal homicides and related research.

Wolfgang’s (1958) groundbreaking study of homicides in Philadelphia, Pennsylvania (n=588) established generalizations of involved individuals by analyzing the demographics and victim-offender relationships of those involved in murders around the late 1940s. He analyzed these factors for both European and African males and females using specific victim-offender relationships and patterns among ancestry, sex, and age (Wolfgang 1967). His analysis was a significant step in analyzing demographic groups in the context of criminal homicides.

Numerous researchers have come to the conclusion that social structure effects crime behavior, but the relationship is not well understood (Bridges et al. 1987:345).
Durkheimian theorists believe economic inequality creates crime thorough social strain (Merton 1949, Cohen 1995). Weberian theory suggests urban and rural differences in crime rates among ethnicities are seen because the “bureaucratic restraints of urban courts” allow less social discrimination than rural courts, where social status can more directly affect court proceedings (Bridge et al. 1987:347). Bridge and co-authors (1987) found ethnic stratification to be a significant factor in imprisonment rates among urban and rural communities. Therefore, these studies show an importance of social stratification, due to community structures, in criminal studies as well as the importance of comparing urban and rural populations.

Wolfgang’s analysis and recognition of victim-offender relationships in criminal homicide cases proved to be a significant factor in his research. Wolfgang (1958:204) divided social relationship categories into 11 different groups and cross-referenced them using the Philadelphia homicide data. The groups used for classification were: close friend, family, acquaintance, stranger, paramour, sex rival, enemy, a lover of offender’s mate, felon or police officer, innocent bystander, and homosexual partner (Wolfgang 1958:204). His interpretation of the results revealed the most common form of victim-offender relationships were “primary groups”, close friends and family, which accounted for 53% of the total cases (Wolfgang 1958:206).

Furthermore, Wolfgang focused on the locations and methods by which criminal homicides in Philadelphia occurred. He then analyzed the variables by demographic populations to produce general statistics and predictions for victims and offenders based on age, sex, and ethnicity. Results of the study revealed that men most often killed other men in public places by beating or stabbing, whereas women most often killed in the
kitchen or bedroom using a knife to stab the victim (Wolfgang 1967:21). Relational data between the victims and offenders showed that most homicides in Philadelphia were committed by the “primary” group, or those with frequent, close, or intimate contact (Wolfgang 1967:23). However, European males were more commonly killed during the commission of a robbery than any other ethnic group, and therefore were shown to be often killed by strangers (Wolfgang 1967:23).

Other unique topics included in the study involved victim precipitation, the presence of alcohol during criminal homicides and the discovery of motivations driving the act of murder. Victim-precipitation is defined by Wolfgang (1958:252) as a situation in which the actions or words of a victim prompt an offender to commit homicide. He uncovered numerous factors significantly associated with the victim-precipitated homicides (n=150) such as, victims and offenders of African ancestry, domestic slayings, and alcohol (Wolfgang 1967). Alcohol was discovered as a leading variable in two-thirds of the homicide cases, with significant association to either victims or offenders of African descent (Wolfgang 1967:22). His study also revealed five main homicidal motives: domestic disputes, vague altercations, money related issues, robbery, and jealousy (Wolfgang 1967:23). He compared these motives to the victim-offender relationship for the purpose of discovering reoccurring themes. His results revealed three of the five main motives were significantly linked to the “primary groups”, signifying a correlation to motive that warrants further research (Wolfgang 1967).

The variables investigated by Wolfgang’s study in 1967 are applied in the present research project. The variables were modeled after his example, since they demonstrate a sophisticated analysis for determining associations. Similar studies conducted by other
researchers provided more in depth explanations and analyses for the variables this project uses, and therefore are addressed accordingly.

Victim and Offender Demography

Demographic statistics of victims and offenders have been an interest to crime analysts, because the implications inferred from these variables can be invaluable for law enforcement. Various researchers (e.g., Curtis 1974, Daly and Wilson 1988, Harries 1997, Avakame 1998, Lauritsen and Schaum 2004) have explored the various demographic relationships in criminal homicides and have found a generalized pattern among age, race, and sex variables. These demographic variables are important in understanding the social relationships between victims and offenders, as well as understanding the demographic dynamics between them.

Age, sex, and ethnicity variables from different populations and time periods have been repeatedly analyzed and are suggested to be strong predictors of violence (Wolfgang 1967, Curtis 1974, Harries 1997). General statistical analyses of demographic crime variables have indicated particular groups of victims and offenders involved in homicides. For example, Harries (1997:17) refers to homicide as, “A crime that disproportionately affects young adults”.

In addition, Curtis (1974:34) researched the age of individuals involved in homicides and concluded “the most disproportionate offender [age] range covers young adults in their teens and twenties”, with victims appearing in the slightly older age group than the offenders do. In support of these statements, it has been noted across studies (Wolfgang 1967, Daly and Wilson 1988, Harries1997, Federal Bureau of Investigation
1998) that the age of both victims and offenders seems to concentrate around the 20’s age group in criminal homicides. Younger women, according to Lauritsen and Schaum’s (2004:340) report, are at a much higher risk of being victimized by “strangers, non-strangers, and intimate partners than older women”. As such, age has consistently and repeatedly been highly correlated with persons involved in criminal homicides (Avakame 1998:609).

In addition to age, the sex variable has been used to better understand criminal homicides. In Silverman and Kennedy’s study (1987:276), females were more likely to be killed by a male, while males were more likely to kill other males. In conjunction with these findings, it appears that males are over-represented as both offenders and victims in homicide studies (Curtis 1974:32, Harries 1997:18, Avakame 1998:609). Nonetheless, Verkko points out that “when the general criminal homicide rate is low in a given culture, the percentage of female offenders is generally higher…thus suggesting a greater stability in the amount of female homicide” (Wolfgang 1967:4).

Lastly, the ethnicities of victims and offenders in homicides have been used to uncover intra- or inter-ethnic correlations (Van Patten and Delhauer 2007). Van Patten and Delhauer (2007) found most sexual homicides to be intra-ethnic in the city of Los Angeles, California. Furthermore, Lauritsen and Schaum (2004:325) established female victimization was subject to ethnic group categorization, which proved to be a significant factor since, “Higher levels of intimate partner victimization among blacks versus whites appear to be limited to younger women”. In Websdale’s (1999:79) analysis of 78 male-female domestic homicides in Florida, results showed an approximately equal proportion of homicides were committed by both European and African ancestries, followed by
Hispanics. Websdale (1999:204) concluded with a comment regarding the over-representation of African individuals involved in domestic homicides, including the offender. One possibility for this over-representation stems from the “subculture of violence” theory, proposed by Wolfgang and Ferracuti (1967). The “subculture of violence” theory posits that various reference groups are frequently surrounded by violence, which may be seen as an act to be admired or expected (Daly and Wilson 1988:286-287). This theory, however, remains a debated topic among anthropologists and sociologists alike for the cultural differences between groups may change over time and do not necessarily predict behavioral outcomes of the community (Daly and Wilson 1988).

In support of Websdale’s (1999) comment regarding over-representation, other studies of homicide demographics have come to similar conclusions on victim and offender ethnicity. For example, focusing on the African and European ethnicities in the United States during 1967, Curtis (1974:20) established that approximately two-thirds of crime, committed between the two specific ethnicities, was conducted by the African population. Also, Harries (1997:19) reports a study in 1983 that ascertained homicide to be the leading cause of death for African-Americans, and the fact that they were 6.7 times more likely to be involved in a homicide than European-Americans were.

However, Daly and Wilson (1988:170) concluded “circumstantial variables are related to the probability in becoming involved in lethal violence”, even when put in the age-sex perspective. This statement exposes the need to analyze demographics in conjunction with variables that may influence homicides, and is acted upon in the current paper.
Studies on demographic representations among criminal homicides (Wolfgang 1967, Curtis 1974, Silverman and Kennedy 1987, Daly and Wilson 1988, Harries 1997, Avakame 1998, Federal Bureau of Investigation 1998, Websdale 1999, Lauritsen and Schaum 2004, Van Patten and Delhauer 2007) are continued and expanded within the current study. In the present project, age, sex, and ethnicity of the victims and offenders are used to compare results among each community. These comparisons are then explained using United States census data and used to help understand victimization for each region.

**Victim Precipitation**

The act of homicide can be affected or instigated by the phenomena known as victim precipitation. Marvin Wolfgang (1957:2) was the first to construct the concept of “victim precipitation” or, the situations in which the victim incites the offender to commit a crime, whether knowingly or unknowingly (Swatt and He 2006:281). Intimate partner homicide has been a main focus for victim precipitated murder studies (Goetting 1987), particularly when a female offender is involved. However, victim precipitation is not unknown in stranger homicides (Felson and Messner 1998:405), and therefore must be considered as well. The presence of victim precipitation in a homicide may enhance the understanding of the dynamics between the victim and offender, when related to social relationship.

According to Goetting (1987), the concept of victim precipitation is a focal variable when studying domestic homicides involving a female offender, because of the unbalanced ratio of women who kill their abusers. Wolfgang (1958:260) found that there
were more husbands killed by females, compared to males killing wives, in domestic homicides when victim precipitation was involved. In addition, Wolfgang’s Philadelphia study (1958) exposed the presence of alcohol as a significant factor in homicide events that involved victim precipitation (Cohen 1970:462). Campbell (1992), Rosenfeld (1997), and Mann (1998) conducted similar studies on female offenders and the presence of victim precipitation, and their results supported those of Wolfgang (1958) and Goetting (1987). Additionally, Felson and Messner (1998:406) found that most female-committed murders involved victim precipitation, despite the setting of a domestic or non-domestic situation.

Nevertheless, it should be noted that victim precipitated homicides do not always indicate a female offender, nor is a female offender indicative of a domestic homicide. Jurik and Winn’s 1990 research on offender prediction in victim precipitated homicides suggested that demographic variables were not significant in predicting the offender’s sex, but situational variables, including victim precipitation, were significant (Swatt and He 2006:283). Furthermore, Felson and Messner (1998:408) suggest the large amount of victim precipitation seen in female offender domestic homicides may be due to the lack of female victims in the situation. This factor is seen as significant when compared to the non-domestic homicides with female offenders, in which females are also victimized (Felson and Messner 1998:408).

Situations in which homicide offenses occur are described by Felson and Messner (1998:408) using three models of victim precipitation: Gender-Partner Interaction, Gender Interaction, and Gender Differences. The Gender-Partner Interaction model refers to women who kill their partners while responding to violence towards them,
thereby motivating the act of self-defense (Felson and Messner 1998:408). The model labeled “Gender-Interaction” refers to “a three-way statistical interaction among the gender of the offender, the gender of the victim, and the relationship between the two parties” (Felson and Messner 1998:408). Lastly, the Gender Differences model which explains the differences of actions between men and women. An example of this model is, “When women kill, their behavior is more likely to be precipitated by a violent attack than when men kill, because women are usually less violent” (Felson and Messner 1998:409). Nonetheless, homicides involving children, non-intimate relationships, and strangers may also include the dynamic of victim precipitation, and therefore, cannot be discounted (Felson and Messner 1998:405).

Studies have found (Wolfgang 1957, Wolfgang 1967, Goetting 1970, Campbell 1992, Rosenfeld 1997, Mann 1998, and Felson and Messner 1998) that females comprise a large percentage of the offenders in domestic situations because of victim precipitation, whether in self-defense or otherwise. Although domestic homicides have been seen as one of the main situations in which this precipitation ends in a homicide, other types of social relationships can result in a victim precipitated homicide as well.

Victim precipitation is identified and analyzed within the present paper for both domestic and other homicide situations. Based on the Gender-Interaction and Gender-Difference models defined by Felson and Messner (1998) and the circumstances founded by Wolfgang (1957), the presence of victim precipitation will be related to sex, the type of homicide, and the social relationship between the victim and offender.
Defining Social Relationships

The relationship between a victim and his/her offender has been scrutinized by many studies (Wolfgang 1958, Curtis 1974, Silverman and Kennedy 1987, Riedel 1987, Williams and Flewelling 1987, Decker 1993, Avakame 1998, Felson and Messner 1998, Miethe and Regoeczi 2004, Swatt and He 2006). Silverman and Kennedy (1987:273-274) state these affiliations are, “considered to be of paramount importance” when investigating homicides, for the attachment described through social relationships can be used to explain aspects of crime. According to Miethe and Regoeczi (2004:227), this stressed importance is the foundation of the assumption that victim-offender relationships “form the basis for fundamentally distinct homicide situations”. This belief is supported by Silverman and Kennedy (1987), who maintain the idea that relational distances among individuals can have a great influence on predicting elements of homicide.

Although studies have used different types of relational systems (Parker and Smith 1979, Messner and Tardiff 1985, Riedel 1993, Decker 1996, Laureitsen and Schaum 2004), the present study follows the example of a variety of others (Riedel 1987, Williams and Flewelling 1987, Decker 1993, Miethe and Regoeczi 2004) who used three encompassing relationship categories:

- Domestic, which includes intimate partners and family
- Non-domestic, defined as a friend, neighbor, coworker, or acquaintance
- Stranger

The first category of relationships, labeled “domestic” is defined as; a group of people romantically involved at one point of time, including ex-husbands and romantically significant others (Silverman and Kennedy 1987:282). This classification
also includes family affiliations such as parents, children, and extended family members. Casual relationships, or the “non-domestic” group, are those that involve friends, acquaintances, neighbors, and co-workers (Silverman and Kennedy 1987:282). Lastly, strangers are defined as people who have never met before (Silverman and Kennedy 1987, Riedel 1993:1).

In numerous academic fields, there has been much debate regarding the existence of differences between relational homicides (Avakame 1998, Felson and Messner 1998, Swatt and He 2006). Avakame (1998:609) addressed this dispute by conducting an inter-and intra-state study using multilevel models of homicide, which suggested age, sex, and weaponry were important factors to consider in homicide correlations. The results of the study implied that across the United States, the incidence rate of stranger and domestic homicides differ significantly. Avakame’s (1998:624) explanation is that stranger homicides occur more frequently in urban areas due to the social disorganization and population differences. This rationalization is theoretically supported by Zimring et al. (1983:910) who states, “It is a criminological cliché…” that an individual will be killed by a known offender rather than a stranger. However, according to Curtis (1974:49), stranger homicides determine less than thirty percent of victim-offender relationships in urban populations.

Therefore, the present study tests the victim-offender relationship in terms of an urban and rural society. Taking into account the population structures of each community, cases with significant spatial distributions are cross-referenced with relationship status. Social relationships are also associated to the relevant distance frequencies of the selected spatial sites.
The main social relationship focus for the current study is the stranger, non-domestic, and domestic categories previously described. This paper expands on the relationship paradigm by using empirical evidence of extant data to demonstrate the usefulness of relationship status in criminal homicides. The importance of relationships is illustrated using by GIS maps and distances. This allows the capacity for a more accurate depiction of the physical locations and sites to be spatially correlated in terms of the relationships between the victims and offenders.

Comparing Crime Rates among Communities

The analysis of crime rates between countries has proven to be a collective success among scholars; however, a comparison of crime at the micro-level, different communities within a country, is lacking research. The current study demonstrates the different variables of criminal homicide between an urban and rural population, and therefore, the framework for societal comparison is useful.

Supporting evidence for the variation of homicide rates cross-nationally, caused by cultural differences, can be seen within the literature (Archer and Gartner 1984, Gartner 1990). These cultural variations are manifested through exposure to violence, economic inequality, the opportunity for victimization, and violence as a response to conflict (Gartner 1990:96). Gartner (1990:94) notes the homicide rate in the United States is markedly higher and differently composed than that of other developed countries. Four characteristics of a community that affect homicide rates were interpreted as: economic inequality, social control, population activities and composition, and exposure to violence (Gartner 1990: 94). The applied analysis in the current project
tests these ideas on a micro-analysis level within the context of two differently structured communities.

Williams and Flewelling (1988) and Pokorny (1965) statistically approach comparisons of homicide rates among American cities. Empirical studies of this nature include structural and cultural dynamics that produce homicides within the country (Williams and Flewelling 1990:425). Focusing and separating the victim-offender relationship, demographics, case characteristics, and the precipitating event, the authors each find both cultural and structural variables had a significant effect on homicide rates (Williams and Flewelling 1990:425, Pokorny 1965:480). The method of homicide, location of murder, and relationship status, among other variables, all proved to diverge from each other within the context of the specific counties (Pokorny 1965). The researchers conclude the most effective approach to a comparative homicide analysis is by separating the structures that contribute to the act of homicide itself (Williams and Flewelling 1990, Pokorny 1965). Therefore, the current paper applies the separation method, suggested by Williams and Flewelling (1990) and Pokorny (1965), to achieve an accurate homicide comparison.

Numerous research efforts show the importance of a homicide comparison and the implications the various results have on crime analysis. Using specific variables, a comparison study of an urban and rural community is conducted to identify varied associations between homicides and their relevant locations, within the context of social relationships. The differences in structural and cultural dynamics within the community settings are also addressed, using census information of the populations and the fluidity of the population structure, for the structural aspect.
The cultural ideas being tested are:

- The notion of more “stranger” encounters occurring in the urban population, due to the mobile dynamic of the Hillsborough County population.
- Comparing the similarities and differences of the victim-offender relationship of a rural society to an urban society, based on criminal homicide events.
- Discerning the cultural differences between the two communities, such as case specifics and murder locations.

**Spatial Distributions in Crime**

The concept of crime-analysis and mapping has become a growing body of literature in academia. According to Canter (2000:4), crime analysis is defined as, “The collection and analysis of data pertaining to a criminal incident, offender, and target”. Multiple papers (Amir 1971, Messner et al. 1999, Canter 2000, Lundrigan and Canter 2001, Snook et al. 2005, Santtila et al. 2007) have laid the foundation for geographically mapping homicide events using GIS, and have given validity to its uses. Canter (2000:5) explains the advantages of using GIS for tactical crime analysis, which is comprised of pattern detection and linkage analysis, and how examining aspects of crime in a geographical context can contribute to a better understanding of offender patterns.

Messner and coworkers (1999), and Santtila et al. (2007) analyzed homicide patterns through spatial and temporal analyses surrounding similar communities. These studies focused on the spatial clustering of homicides on the geographic level, but did not
include the demographic and case specific data, as seen in Avakame (1998) and Wolfgang (1958). Both Messner et al. (1999) and Santtila et al.’s (2007) studies used victim and offender residences and crime scene locations within their study, as is done in the current paper. Messner et al. (1999) concluded that spatial randomness does not occur among sites and that there is suggestion of a diffusion process within the results. In agreement, Santtila et al. (2007:12-14) discovered the distances between sites differed significantly and it was possible to identify crime features that were correlated with distances. However, both studies are at a disadvantage due to the lack of acknowledgement toward the social relationships between the victim and offender, as well as pertinent case information. The case information and social variables may have explained the non-random movement. Although Pokorny (1965) attempts to address the relationships between the victim and offender, and spatially relate them, his study fails to support his findings with mapping or distances.

Anthropologic training can aide a researcher with integrating both the social relationship and the spatial patterns of offenders and victims into a powerful tool for crime analysis. The field of anthropology is focused on the recognition of social and cultural structures, which can affect and influence crime. The spatial distributions are also applicable to anthropology, because the social stratifications and structures of communities are inherently founded on the physical layout of the site (Bevan and Conolly 2002, Kvamme 2003). Landscape archaeology uses the geophysical layout of past populations to understand and analyze the “patterned geometries of the landscape” (Kvamme 2003:438). The concept of landscape archaeology is utilized in large surveys to study the cultural and structural aspects of archaeological sites (Kvamme 2003).
Recent advances in the field have allowed for the “wide-area mapping of settlement spaces to reveal their organization and structure” (Kvamme 2003:436). Bevan and Conolly (2002) use GIS tools to analyze the spatial organization of an archaeological site in Greece. Using GIS and surveying techniques, Bevan and Conolly (2002:136) analyzed “the structure of the modern landscape…., the visibility and definition of archaeological sites…., [and] the interpretation of site distribution patterns”.

GIS is also useful for illustrating distribution patterns and identifying clusters from cultural evidence (Lock, Bell, Lloyd 1999; Gillings and Sbonias 1999). Kvamme (2003:436) states, “Survey of large contiguous areas is … essential for making sense of patterns in cultural landscapes using geophysical datasets”. Therefore, the utilization of landscape surveys and GIS interpolation and mapping are useful tools in the geographical analysis of the current project. The distances between locations involved in homicides play a large role in understanding the movement and influences of the acts of homicides and the people committing them.

The landscape archaeology concept can also be used as a tool for spatial and societal comparison. For example, a cross-national spatial analysis scrutinizing the distance of residences and disposal sites of serial killers in the United States and United Kingdom was performed by Lundrigan and Canter (2001), while Snook et al. (2005) analyzed spatial distributions of serial homicide offenders in Germany. Spatially tested variables within each study included: the disposal sites and the assailant’s domain, as well as the spatial distributions compared to the assailant’s daily activities (Lundrigan and Canter 2001, Snook et al. 2005). Also spatially scrutinized were the changes in the size of the disposal site distances and the “hunting” ranges over time (Lundrigan and
Canter 2001, Snook et al. 2005). These analyses are based off the principle of landscape archaeology because they are plotting the human-landscape interaction.

The theoretical background of Lundrigan and Canter (2001) and Snook et al. (2005) is based on the degree of comfort the offenders feel within a certain distance from their residence and where they conduct normal daily activities (Brantingham and Brantingham 1981, Canter and Larkin 1993). Examinations of the geographical distributions supported Lundrigan and Canter’s (2001:609) and Snook et al.’s (2005:601) hypotheses and determined that a serial killer’s spatial choices were influenced by rational choice and routine activity. Although the focus of these studies are directed specifically toward serial killers, the spatial distribution of scenes, in relation to the individuals involved, are comparable methods to those used in the current thesis.

Menachem Amir (1971) discussed the significance between spatial distribution and area relationships and analyzed four varieties of spatial relationships between the area of residence and area of crime. The mobility triangle distributions were labeled: residential, crime, neighborhood, and total (Amir 1971:91). The residential triangle is described as a situation in which the “offender lives in the area of the offense, but not in the area of the victim’s residence” (Rand 1986:118). The crime mobility triangle is seen in cases where the offender lives in the vicinity of the victim, but the crime is committed elsewhere” (Rand 1986:118). The neighborhood triangle is the relationship in which “the house of one or more offenders and the place of offense are located in the same neighborhood” (Amir 1971:91). Lastly, the total mobility triangle is expressed as a situation where “the offender does not live in the vicinity of the victim or offense” (Rand 1986:118). These combinations of sites, along with the victim and offenders residences,
are included in a “vicinity of crime”, which is defined by Amir as a five city block area (1971:91).

Although Amir’s study focused on rape, his spatial concepts of crime vicinities are useful in comparing the factors pertinent to a homicide event. The ideas surrounding his crime vicinities are utilized in the current project by looking at the proximity of victim residence to offender residence, the residential distances and their relationship to where murders are occurring, and the differences in murder and disposal site in relation to residences for relevant cases.

According to Messner et al. (1999), non-random behavior is not a factor in geographic crime analysis, however, non-random behavior in the presented study is expected, and is specifically investigated by using case specific, demographic, and geographical data to gain a complete picture of homicide incidences. Criminal homicide analyses, using rigorous methods adapted from the mentioned researchers (Amir 1971, Messner et al. 1999, Canter 2000, Lundrigan and Canter 2001, Snook et al. 2005, Santtila et al. 2007), are used in determining social relationships between individuals and correlating spatial distributions. The capabilities of GIS will clarify these variables through the features of mapping, database capabilities, accuracy, and its ability to correlate one or more attributes for pattern analysis.

The current study presented here expands on homicide investigations by incorporating ideas of revolutionary authors in crime analysis and supporting the results using statistical tests and GIS models to more completely understand criminal homicides. The social relationship between a victim and offender are related to specific case information, demographics of the parties involved, and the spatial patterns of the
movement and vicinities in which relevant locations are positioned. Using a holistic anthropological perspective that incorporates both cultural and biological variables influencing and effecting homicide, a culturally-specific model of homicide is constructed.
Chapter 3

Methods

Population differences of social violence are important for understanding the circumstances surrounding the crime and preventing increases in crime rates for a specific location. Homicide data were collected from both a rural and urban location: Lancaster County, Nebraska (n=48) and Hillsborough County, Florida (n=420). All the cases were used in several aspects of the study; however, some of the case information was incomplete. Therefore, the incomplete cases were excluded from particular analyses, and are reflected in the sample sizes. The data were used to compare and evaluate the spatial distributions between the two regional contexts, as well as the social relationships between the individuals involved in each case. This analysis allowed implications to be made from differences seen in the communal aspects of homicide, which were inferred both spatially and case specifically. The homicide documentation and case information were acquired by accessing law enforcement and autopsy records of several different law enforcement agencies and affiliated institutions from both regions.

Records from participating law enforcement organizations consisted of police reports, case summaries, case supplements Violent Criminal Apprehension Program (ViCAP) records, and autopsy reports. The above resources were considered acceptable for use because of their status as public documents as well as consideration of Edem Avakame’s statement (1998:608), “Homicide data are among the most accurate criminal
justice data”. In addition, the protocol used for data collection was made specifically for the purpose of collecting homicide data from primary sources such as police records and other public documents. The current paper is part of a larger on-going joint research project between the University of South Florida and Hillsborough County law enforcement agencies which is studying the spatial distribution of criminal homicides. Nebraska data were added to the thesis research to add the component of society structure comparison.

The data representing Hillsborough County, Florida were procured from the Tampa Police Department, Hillsborough County Sheriff’s Office, and the Temple Terrace Police Department. Data were collected by Casey C. Anderson, Erin H. Kimmerle, Ph.D., Rhonda Coolidge, Melissa A. Pope, and Samantha M. Seasons and Corporal Mike Lowell. The Lancaster County data, from the Lincoln, Nebraska area, were obtained through autopsy records from the Nebraska Institute of Forensic Science, Lincoln Police Department, and the Lancaster County Sheriff’s Office. The information collected in both regions are case summaries and details of “closed homicide” cases from 1997-2007.

Factors of Homicide

In the current project, “closed cases” are considered those in which the offender is known and has been arrested, has died, or has been sentenced. Based on the crime analysis foundations laid by Wolfgang (1967), homicide is divided into criminal and noncriminal categories. This study only focuses on criminal cases or those which are “premeditated, felonious, intentional murders” or “slayings in the heat of passion”
Noncriminal homicides are considered excusable for reasons that are not seen as relevant for the particular analysis, and therefore are excluded.

The current research project analyzes closed criminal homicide cases that consist of those in which the primary offender is known and law enforcement is no longer pursuing them. The data involved a few cases in which there were one or more offenders; however, the focus for this study is only on the person who actually caused a victim’s death. Included in these cases are stranger homicides, domestic homicides, child homicides, murder/suicides, and some cases dismissed by exceptional clearance. Cases closed by exceptional clearance are those in which reasons, outside of police control, occurred to prevent the offender from being arrested, charged, and prosecuted (Federal Bureau of Investigation 2004:150). Certain dismissed cases, such as murder-suicides, are included in this study because of their potential to portray vital information relevant to the study. Excluded homicide cases are those caused by justified police shootings and non-criminal homicides such as self-defense, vehicular manslaughter, and those closed by the issue of a warrant.

Homicides that were omitted are not applicable to the project because of the lack of malice and difference in social relationships between those involved. However, it should be noted that the relationships of those involved in self-defense homicide cases have the potential to reveal interesting anthropological information, such as the demographics of the victim and offender, motives behind the original attack, and the spatial proximities to specific locations from the attack site.
Population Data

Census data collected in 2000 and supplementary government documents (U.S. Department of Commerce) tracking the demographic, migration, tourism, population growth, and homelessness rates of each population were used to differentiate the community structures of the study sites. Using total population statistics, ratios of males to females, median age, and population distribution by race, the differences between Lancaster County, Nebraska census data and Hillsborough County, Florida census data are illustrated in Table 3.1.

Data resulting from the 2000 United States Census data, Lancaster County, Nebraska had a total population of 250,291 people living within the limits, with a density of 298 people per square mile (U.S. Department of Commerce). The male to female ratio is even at 50 percent each. Median age of this population is 32.0 years (U.S. Department of Commerce 2000). The majority of people in Lancaster County are of a European ethnicity; a population percentage of 90.1% (U.S. Department of Commerce 2000). Hispanic, African, and Asian ethnicities are the next three represented, however their population percentages only range from 2.8% to 3.4% (U.S. Department of Commerce 2000).

Hillsborough County, Florida has a substantially greater population totaling 998,948 residents and 951 people per square mile (U.S. Department of Commerce 2000). Male to female ratios are only slightly off-balance, with females having a slightly higher percentage at 51.1% (U.S. Department of Commerce 2000). The median age of the Florida population is 35.1 years (U.S. Department of Commerce 2000).
Table 3.1- 2000 U.S. Census Data for Lancaster and Hillsborough County
(U.S. Department of Commerce 2008 Supplementary Population Report)

<table>
<thead>
<tr>
<th></th>
<th>Lancaster County</th>
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<th>Hillsborough County</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percentage</td>
<td>Count</td>
<td>Percentage</td>
</tr>
<tr>
<td>Total Population</td>
<td>250,291</td>
<td>100.0%</td>
<td>998,948</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>125,029</td>
<td>50.0%</td>
<td>488,772</td>
<td>48.9%</td>
</tr>
<tr>
<td>Females</td>
<td>125,262</td>
<td>50.0%</td>
<td>510,176</td>
<td>51.1%</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European</td>
<td>225,426</td>
<td>90.1%</td>
<td>750,903</td>
<td>75.2%</td>
</tr>
<tr>
<td>African</td>
<td>7,052</td>
<td>2.8%</td>
<td>149,423</td>
<td>15.0%</td>
</tr>
<tr>
<td>Asian</td>
<td>7,162</td>
<td>2.9%</td>
<td>21,947</td>
<td>2.2%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>8,437</td>
<td>3.4%</td>
<td>179,692</td>
<td>18.0%</td>
</tr>
<tr>
<td>American-Indian</td>
<td>1,599</td>
<td>0.6%</td>
<td>3,879</td>
<td>0.4%</td>
</tr>
<tr>
<td>Other</td>
<td>4,374</td>
<td>1.8%</td>
<td>47,266</td>
<td>4.8%</td>
</tr>
</tbody>
</table>
Ethnic profiles show a majority of the residents also have a European background at 75.2 % (U.S. Department of Commerce 2000). However, the Hispanic and African populations show a substantial amount of residents present at percentages of 18.0% and 15.0%, respectfully (U.S. Department of Commerce 2000).

When comparing these demographic statistics, the social composition differences between the populations are clear. A much larger site is seen within Hillsborough County, which gives people more opportunity for crimes because of the density of the population, whereas the smaller Lancaster County population density allows for more space between individuals. The percentages of ancestry are also different when comparing population to population. This factor proves to be important when comparing inter- and intra-ethnic murders and their frequencies.

Major influences on a community’s social structure and composition are provided by the opportunities for mobility and fluidity within the population. The tourism industry is one such key influence on a community because it can cause many demographic and population density fluctuations in a short period of time. For example, Tampa, Florida houses both an international airport and ship dock through which millions of people flow during a single year. The Tampa Bay Convention and Visitors Bureau in Hillsborough County calculated 9.39 million domestic passengers and 185,768 international passengers flew into and out of the Tampa International Airport during 2007 (Tampa Bay and Company 2009). The international maritime port was responsible for 735,734 people traveling to and leaving from Tampa Bay (Tampa Bay and Company 2009). The vast amount of non-residents continuously visiting Hillsborough County significantly affects the population and community dynamics.
In contrast, Lancaster County has no ship ports or international airports, and therefore is not a large tourist or visitor location (Nebraska Department of Economic Development 2008). Approximately one million people visit the Lancaster County area every year (Lincoln Convention and Visitors Bureau 2008). Therefore, the two communities have significantly different tourism rates and greatly differ in social composition, which can affect homicide and crime rates within each area.

Migration is another social factor that can influence population development. The United States Census Bureau defines population development by using birth rates, death rates, domestic migration and international migration (U.S. Department of Commerce 2008). According to the 2000-2004 U.S. Census estimates, the total net migration for Hillsborough County was 16.9%, whereas Lancaster County had a 2.4% net migration rate (U.S. Department of Commerce 2008). These percentages show a large discrepancy between the migration rates of the populations, for the Florida community had a much higher rate than Nebraska.

An additional social variable that can affect homicide rates is the poverty level of residents. Referenced in numerous studies (Rosenfeld 1986, Gartner 1990, Eitle et al. 2006, McCall et al. 2008), the social disequilibrium of poverty has the potential to play an important role in the social production of crime. Thus, the percentage of the population who qualified for poverty status, in each pertinent county, was researched and compared. Again using the 2000 U.S. Census data (U.S. Department of Commerce), Hillsborough County had 12.5% of the population, at all ages, categorized as below the poverty line. Lancaster County had only 9.7% of the population, at all ages, under the poverty line (U.S. Department of Commerce 2008).
The total population quantities and the percentage of poverty in each county shows the more urbanized area seem to have a higher social disequilibrium, when referring to overall social wealth. In addition to poverty, the percentage of homeless individuals also affects the social marginality of a community. According to the Homeless Coalition of Hillsborough County, there were 9,532 homeless men, women, and children in the Tampa, Florida area during 2005. Lancaster County did not have specific data related to homelessness; however, the 2002 Census estimates revealed 9.2% of the Lancaster County population was expected to be below 100% poverty (U.S. Department of Commerce 2008).

The differences between subject sites suggest a propensity towards higher crime rates in the urban area, due to the higher rate of poverty, migration, and tourism in Hillsborough County. These factors that influence economic disparities between communities play an important role in understanding the amount and types of crimes committed within each county.

Methods of Analysis

Data analysis began with the demographic profiles of both victims and offenders, which consisted of evaluating ancestral backgrounds, sex, and age from law enforcement documents. The social relationships between the involved individuals were also assessed using case information and documentation. Other specific case data were collected using a standardized protocol for a complete synopsis of the circumstances surrounding the homicide (Appendix A). The protocol is part of a larger research project being conducted at the University of South Florida, and therefore includes more variables than are
analyzed in the present paper. Additionally, spatial information was analyzed using the residential addresses of the involved individuals and the addresses of the sites in which relevant occurrences happened, such as the murder site and the disposal site (Table 3.2).

The demographic characteristics of the entire population associated with homicides, for each study site, were developed into generalized categories. Ancestries of the individuals involved the following categories: European, African, Asian, Hispanic, American-Indian, and Others. Age is represented in years; however, those victims who were younger than one year of age were represented as 0 for statistical purposes. Frequencies of ages were conducted by grouping ages together in 10 year increments. The age distributions for victims and offenders from each site are illustrated in Figures 3.1 to 3.4. Sex was restricted to only male and female categories.

**Homicide Variables and Definitions**

A social relationship categorized as “stranger” is defined by Silverman and Kennedy (1987:282) as, “offenders who had no known relationship with the victim”. A “domestic” relationship categorization was used if any of the following relationship variables were present between the victim and offender: marriage, divorce, separation, blood relative living in the same domicile, co-existence, or in a romantic or sexual relationship (Felson and Messner 1998, Miethe and Regoeczi 2004, Swatt and He 2006). “Acquaintance” relationships are categorized as those in which the victim and offender have met at least once, or have been friends for any amount of time (Wolfgang 1958:204).
<table>
<thead>
<tr>
<th>Demographics</th>
<th>Age, Sex, and Ancestry</th>
</tr>
</thead>
</table>
| Victim-Offender Relationship | Parent  
Child  
Romantic  
Friend  
Acquaintance  
Co-Worker  
Neighbor  
Stranger  |
| Location | Victim’s Residence  
Offender’s Residence  
Murder Location  
Body Deposition Site  |
| Presence of Case Specifics | Degree of Homicide  
Victim Precipitation  
Drugs and Alcohol  
Mechanism of Death  
Weapon Used  
Body Recovery Location  
Murder/Suicide  |
A “co-worker” relationship is one in which the victim and offender have held jobs at the same company during overlapping time periods (Wolfgang 1958:204).

During the analysis of these variables, the relationship variables were collapsed together into three smaller categories labeled: domestic, non-domestic, and stranger. (Table 3.3). Domestic homicides include victim-offender relationships of spouse, significant other, parent, child, or relative. Non-domestic relationships involve neighbors, co-workers, friends, or acquaintances. Lastly, the stranger category encompasses only with offenders who had no previous connection with the victim. These categories were made to simplify the results while including all possible social relationships that may be seen in criminal homicides.

Furthermore, murder is legally divided into degrees which represent the different types. The degrees of homicide are ordered as first and second degree murder, followed by voluntary and involuntary manslaughter.

- First-degree murder consists of an intentional killing with both premeditation and malice aforethought of an act that results in a person’s death (Blinn 1950:729).
- Second-degree murder is a death from an assault with aforethought malice but no premeditation of the act itself (Blinn 1950:730).
- Voluntary or non-negligent manslaughter are considered acts of manslaughter, in which an act is committed in attempt to hurt, but not kill, another human being yet the victim dies in the process (Desch 1963:660).
- Lastly, negligent or involuntary manslaughter is characterized by “the killing of a person through gross negligence” (Federal Bureau of Investigation 2004:152).
<table>
<thead>
<tr>
<th>Table 3.3 – Victim-Offender Relationship Categories</th>
</tr>
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<tbody>
<tr>
<td>Domestic</td>
</tr>
<tr>
<td>Marriage</td>
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<tr>
<td>Divorce</td>
</tr>
<tr>
<td>Separation</td>
</tr>
<tr>
<td>Significant Other</td>
</tr>
<tr>
<td>Parent</td>
</tr>
<tr>
<td>Child</td>
</tr>
<tr>
<td>Co-existence</td>
</tr>
<tr>
<td>Blood Relative</td>
</tr>
<tr>
<td>Non-Domestic</td>
</tr>
<tr>
<td>Friend</td>
</tr>
<tr>
<td>Acquaintance</td>
</tr>
<tr>
<td>Co-Worker</td>
</tr>
<tr>
<td>Neighbor</td>
</tr>
<tr>
<td>Stranger</td>
</tr>
<tr>
<td>No relationship exists</td>
</tr>
</tbody>
</table>


Some states distinguish between vehicular and non-vehicular negligent deaths; therefore, it should be noted that the current study only focuses on non-vehicular deaths.

Other terms that are of importance to this analysis include: victim precipitation and mechanism of death. “Victim precipitation” refers to instances in which the victims’ actions or words resulted in their demise by eliciting a deadly response from the killer (Felson and Messner 1998, Wolfgang 1967:24). Mechanism of death is defined by Adams et al. as the moment or event that causes the cessation of vital functions and the occurrence of death (Spitz and Fisher 2006:440). The mechanism of death categories were defined as: single gunshot wound, multiple gunshot wounds, blunt force trauma, sharp force trauma, strangulation, and other. The variables listed in Table 3.2 are used in statistical analyses to provide anthropological and social definition to the spatial distributions of homicide cases. Statistical analyses of the data, conducted using SPSS 17.0 software, include chi-square tests for independence, cross-tabulations, mean comparisons, Pearson’s correlations, and frequency distributions to identify significant factors and relationships among sites.

The research design is original in that it associates spatial analyses of individual homicides and the relationships between persons involved to identify similarities and differences in homicidal behaviors between communities. Using the locations of scenes and residences, along with the relationship status of the parties involved, the degree of the homicide, presence of homicide/suicide, mechanism of death, and circumstances surrounding the murder occurrence, both the social aspects of the social production of homicide are revealed.
The foundation of this research is based on the different social factors that are found in communities with varied population structures and the implications that social relationships play in the degree of murder instigated and the scene distributions. The framework of a comparative study is implemented for the research of a rural and urban region. Involved in the comparative study are the relationships of individuals and the distributions of sites in both geographical regions by using GIS and statistical analyses.

GIS Methods

The information used for the GIS analysis was identified as residential addresses and physical street addresses of relevant locations. Therefore, geocoding was employed through ArcGIS 9.2 to map the various locations related to a homicide event and use them as spatial factors in the analysis. Geocoding is defined as, “The process of creating map features from addresses, place-names, or similar information” (Ormsby et al. 2004:429). Using the StreetMapUSA 2005 data and a commercial address locator supplied by ESRI 2006, the addresses were input and digitally represented on the state plane projections of Nebraska and Florida. The cases that involved locations outside of the two states were excluded in the spatial analysis. The addresses were each indicated as a point of interest, and were connected using vectors to achieve a polygonal shape representing the spatial area involved. Connections of scenes representing the spatial configurations define distinct situations:

- A solid blue rectangle connected to a solid red triangle represents the victim and offender’s residences, respectfully.
- An orange dotted circle for a case represents a homicide in which the victim and offender resided together and the murder occurred in the shared household, and the victim’s body was not transported to another location.

- A dotted yellow diamond represents a homicide event where the victim and offender resided together, but the murder, represented by a solid green star, occurred elsewhere.

- A blue dotted rectangle with a connecting line to a solid red triangle represents a case in which the victim and offender lived in separate residences and the murder occurred at the victims’ address. In this situation, no movement of the victim occurs after the homicide.

- A red dotted triangle with a connecting line to a solid blue rectangle represents a case in which the victim and offender lived in separate residences and the murder occurred at the offenders’ address. In this situation, no movement of the victim occurs after the homicide.

- A solid blue rectangle connected to a solid red triangle and a solid green star represents a case in which the victim and offender resided at different locations, and the murder occurred in a location other than their homes.

- Lastly, when any of the previous situations are connected to a solid purple pentagon, it depicts the disposal site for the murder.

- Figure 3.5

The solid colored shapes represent separate residences and locations, and the dotted shapes represent locations with multiple importance. The line representation depicts the geometry of the cases that involve multiple scenes.
Figure 3.5

Variations of Spatial Configurations

One Scene
Least Complex

Four Scenes
Most Complex

Two Scenes
Mild Complexity

Three Scenes
Moderate Complexity

Legend
- □ Victim’s Residence
- ○ Co-habitation and Murder Location
- △ Offender’s Residence
- □ Victim’s Residence and Murder Location
- ★ Murder Location
- △ Offender’s Residence and Murder Location
- □ Disposal Location
- ○ Co-habitation Location
The number of dots that connects each case depicts the complexity of the geometry. The analyzed cases were chosen by using frequency data to determine the situations that were most unlike each other between the two regions. Distances, in miles, between the relevant sites were obtained using statistical geometry within the ArcGIS 9.2 software. Associations between the physical distances and the social relationships are then conducted to find spatial trends among each region.

The points of interest and their established distances were subjected to geographic distance analyses to uncover commonalities and disparities of scene locations. These spatial distributions were then cross-referenced to the relationship status for the purpose of identifying universal social variables pertinent to spatial movement.

Comparing the victim-offender relationship of homicides in an urban and rural setting and relating them to the spatial distributions of the residences and scenes revealed the social differences in the production of violence. Statistical analyses and the accuracy obtained using GIS technology allowed the researcher to confidently draw conclusions on spatial patterns associated with certain relationship categories within both an urban and rural community. These conclusions can be used as an investigative tool by law enforcement agencies across the United States, for it uses specific case information, spatial patterns, and social relationships to determine spatial distributions of criminal homicides.
Chapter 4

Results

In this section, the statistical and geographical results location were calculated separately and compiled into comparative tables and figures. The results are then discussed and compared within the sections for each method of calculation. Comparison of the results ensures similarities and differences between the two regions are properly discovered and addressed.

Demographic Characteristics of Victims and Offenders

The specific demographic characteristics of the offenders in Hillsborough County and Lancaster County are seen in Tables 4.1 through 4.3 and Figures 4.1 through 4.3. Within the total number of cases in Hillsborough County (n=420) and Lancaster County (n=48), the percent of offenders who were male are very similar at 91.4% and 91.3%, respectively. The number of female offenders also had a similarly proportionate rate between the two locations, since Hillsborough County (n=36) had a rate of 8.6% and Lancaster County (n=4) had 8.7%, only one-tenth of a percent higher.

The age ranges of offenders between the two populations are different in distribution. In the Nebraska area, over one half of the offender ages are in the 20-29 year old category (52.2%), followed by the 30-39 age category, which comprises 17.4% of the offenders.
Table 4.1 – Frequencies of Offender Age Ranges in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>0.2% (1/411)</td>
<td>0.0% (0/46)</td>
</tr>
<tr>
<td>10-19</td>
<td>12.9% (53/411)</td>
<td>13.0% (6/46)</td>
</tr>
<tr>
<td>20-29</td>
<td>37.7% (155/411)</td>
<td>52.2% (24/46)</td>
</tr>
<tr>
<td>30-39</td>
<td>23.8% (98/411)</td>
<td>17.1% (8/46)</td>
</tr>
<tr>
<td>40-49</td>
<td>14.4% (59/411)</td>
<td>15.2% (7/46)</td>
</tr>
<tr>
<td>50-59</td>
<td>6.3% (26/411)</td>
<td>0.0% (0/46)</td>
</tr>
<tr>
<td>60-69</td>
<td>2.9% (12/411)</td>
<td>0.0% (0/46)</td>
</tr>
<tr>
<td>70-79</td>
<td>0.7% (3/411)</td>
<td>2.2% (1/46)</td>
</tr>
<tr>
<td>80-89</td>
<td>1.0% (4/411)</td>
<td>0.0% (0/46)</td>
</tr>
<tr>
<td>90-99</td>
<td>0.0% (0/411)</td>
<td>0.0% (0/46)</td>
</tr>
</tbody>
</table>

Figure 4.1 - Distribution of Offender Age Ranges among Hillsborough and Lancaster Counties
Table 4.2 – Frequencies of Offender Sex in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>91.2% (383/419)</td>
<td>91.3% (42/46)</td>
</tr>
<tr>
<td>Females</td>
<td>8.6% (36/419)</td>
<td>8.7% (4/46)</td>
</tr>
</tbody>
</table>

Figure 4.2 - Relevant Frequencies of Offender Sex in Hillsborough and Lancaster Counties
Table 4.3 – Frequencies of Offender Ancestries in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>41.0% (171/417)</td>
<td>56.5% (26/46)</td>
</tr>
<tr>
<td>African</td>
<td>41.2% (172/832)</td>
<td>15.2% (7/46)</td>
</tr>
<tr>
<td>Asian</td>
<td>0.0% (0/832)</td>
<td>8.7% (4/46)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>17.5% (73/832)</td>
<td>13.0% (6/46)</td>
</tr>
<tr>
<td>American-Indian</td>
<td>0.2% (1/832)</td>
<td>4.3% (2/46)</td>
</tr>
<tr>
<td>Other</td>
<td>0.0% (0/832)</td>
<td>2.2% (1/46)</td>
</tr>
</tbody>
</table>

Figure 4.3 - Relevant Frequencies of Offender Ancestries in Hillsborough and Lancaster Counties
The Lancaster County data revealed no offenders between the ages of 50 and 69 during the ten year period.

The Florida population of offenders is more evenly distributed throughout all age ranges, but is still heavily focused on the 20-29 and 30-39 age categories. The highest frequency of offenders was found to be within the 20-29 age range (37.7%), followed by the 30-39 range at 23.8%. Hillsborough County offender age ranges of 60-69 (n=12), 70-79 (n=3), and 80-89 (n=4) contained more than one individual, unlike the Lancaster County data.

The differences in offender age ranges between the two locales suggest different types of crimes occurring within each community. The Lancaster County and Hillsborough County data conform to the standardized model of offenders killing in their mid- to late-twenties, as seen in the literature. However, elderly groups from the Florida population indicate more murder-suicides or domestic murders by offenders of these ages.

Ethnic groupings of each county revealed disproportionate offender demographics as well. Hillsborough County showed surprisingly less ethnic diversity among offenders than the Lancaster County population. This result was unexpected due to the population density and fluid nature of the Tampa area. Asians and people not identified as one of the major census categories were not seen in the offending population of Florida, whereas the Nebraska offenders had at least one individual within each census group.

The Hillsborough County data showed a greater and almost equal ethnic distribution of offenders between the European (41.0%) and African (41.2%) groups,
with Hispanics following at 17.5%. The offenders from Nebraska showed a larger gap between ethnicities, with the majority associated with the European category (56.5%). The African (15.2%) and Asian (13.0%) populations followed with a fairly equal distribution. The non-diverse nature of the offenders in the Tampa area reveals an aspect that needs to be more closely inspected. The urbanization of the region would usually be linked with a more diverse ethnic population, yet if certain ethnic groups have lower offender rates, cultural reasons determining this disparity should be addressed.

Demographic data from the victim of homicide in each county were also collected. (Tables 4.4 - 4.6 and Figures 4.4 - 4.6). Closed homicide cases in which the victim was identified prevailed within both Hillsborough County (n=419) and Lancaster County (n=47), with each only lacking one individuals’ identity. Considering the number of closed homicides to the population of each society, Florida had a calculated solved homicide rate of 4.2% over the 10 year period, where as Nebraska had a considerably lower solved homicide rate of 1.9% during the same period. Therefore, proportionate to population growths over the 10 year study period, the Florida data was calculated to have a 2.3% rate increase of homicides compared to the Nebraska data.

The percentage of male to female victims between Nebraska and Florida has similar ratios. The Lancaster County victims were 70.2% male, whereas Hillsborough County had 68.3% of their victims identified as male. Female victims had a comparable rate of frequency between the locations at 29.8% in the Nebraska location and 31.7% in the Florida region. However, it should be noted that the number of females killed in the urban Florida population were higher by 1.9%. 
Table 4.4 – Frequencies of Victim Age Ranges in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>7.7% (32/417)</td>
<td>8.5% (4/47)</td>
</tr>
<tr>
<td>10-19</td>
<td>10.3% (43/417)</td>
<td>21.3% (10/47)</td>
</tr>
<tr>
<td>20-29</td>
<td>25.4% (106/417)</td>
<td>21.3% (10/47)</td>
</tr>
<tr>
<td>30-39</td>
<td>25.7% (107/417)</td>
<td>23.4% (11/47)</td>
</tr>
<tr>
<td>40-49</td>
<td>15.1% (63/417)</td>
<td>14.9% (7/47)</td>
</tr>
<tr>
<td>50-59</td>
<td>9.6% (40/417)</td>
<td>4.3% (2/47)</td>
</tr>
<tr>
<td>60-69</td>
<td>3.1% (13/417)</td>
<td>2.1% (1/47)</td>
</tr>
<tr>
<td>70-79</td>
<td>2.2% (9/417)</td>
<td>4.3% (2/47)</td>
</tr>
<tr>
<td>80-89</td>
<td>0.7% (3/417)</td>
<td>0.0% (0/47)</td>
</tr>
<tr>
<td>90-99</td>
<td>0.2% (1/417)</td>
<td>0.0% (0/47)</td>
</tr>
</tbody>
</table>

Figure 4.4 - Distribution of Victim Age Ranges among Hillsborough and Lancaster Counties
**Table 4.5 – Frequencies of Victim Sex in Hillsborough and Lancaster Counties**

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>68.3% (286/419)</td>
<td>70.2% (33/47)</td>
</tr>
<tr>
<td>Females</td>
<td>31.7% (133/419)</td>
<td>29.8% (14/47)</td>
</tr>
</tbody>
</table>

**Figure 4.5 - Relevant Frequencies of Victim Sex in Hillsborough and Lancaster Counties**
### Table 4.6 – Frequencies of Victim Ancestries in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>48.2% (200/415)</td>
<td>61.7% (29/47)</td>
</tr>
<tr>
<td>African</td>
<td>34.7% (144/415)</td>
<td>12.8% (6/47)</td>
</tr>
<tr>
<td>Asian</td>
<td>0.5% (2/415)</td>
<td>8.5% (4/47)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15.4% (64/415)</td>
<td>10.6% (5/47)</td>
</tr>
<tr>
<td>American-Indian</td>
<td>0.2% (1/415)</td>
<td>6.4% (3/47)</td>
</tr>
<tr>
<td>Other</td>
<td>1.0% (4/415)</td>
<td>0.0% (0/47)</td>
</tr>
</tbody>
</table>

### Figure 4.6 - Relevant Frequencies of Victim Ancestries in Hillsborough and Lancaster Counties
Age range frequencies for the victims from each community divulged interesting disparities between the populations. The Tampa area had the majority of victims concentrated around the 20-29 year old (25.4%) and 30-39 year old (25.7%) age ranges, whereas the Lincoln area had the majority of victims within the 10-19 year old (21.3%), the 20-29 year old (21.3%), and 30-39 year old (23.4%) age categories.

Lastly, the ethnicities of the victims also showed a difference among the populations. The Lancaster County data exposes the majority of the individuals were recognized as descending from a European line at 61.7%, followed by Africans at 12.8% and Asians at 10.6%. The only ethnic group without a victim from the Nebraska population is the miscellaneous category. Victims from the Tampa area appear to emerge from backgrounds that are more diverse; however, the majority of the population is still centered on the Europeans (48.2%) and Africans (34.7%). Similar to the Hillsborough County offenders, the next highest ethnic category for victims is Hispanic which accounts for 15.4% of the remaining population. All census groups contained at least one victim from the Florida data.

The differences in the ethnicities of each location strongly suggest the composition of the demographic populations of the areas. Victims and offenders with similar ethnic patterns and frequencies allow the demographic identities of individuals involved in homicides, at each site, to be revealed. In Lancaster County, the majority of victims are most likely to be males of European descent, ranging in age from 10 to 39 years of age. Offenders from the region are expected to also be European males within 20 to 49 years of age.
Hillsborough County offenders are expected to most likely be either European or African males, with a slightly higher rate of African ancestry, and have an age within 10 to 49 years old. Victims within Hillsborough County are also expected to be a male in the 20 to 39 year age range and be of European descent. Therefore, the male offender precedent was met, as well as the age at which victims and offenders of homicides become involved.

Although these expectations are not extremely different from each other, the age ranges of victims within the Lincoln area and the ethnicity of offenders within the Tampa area are distinctive of each community. Further statistical analyses are utilized to address questions raised by the frequency results, as well as to analyze the amount of influence variables have on one another within the context of a homicide.

Case Characteristic Frequencies

The characteristic variables that surround and identify each case were subjected to frequency testing to uncover any underlying themes or differences seen across the Florida and Nebraska communities. Statistical analyses that yielded differential results are reported and used as a basis for more extensive research. These analyses allow further questions to be addressed with more complex statistics in future studies.

The frequency distributions for the degree of murder committed, between the two regions, are different. (Table 4.7). According to police and state attorney conviction and charge records, the Tampa area had 53.9% rate of first degree homicides and a 33.2% rate of second degree homicides.
<table>
<thead>
<tr>
<th>Table 4.7 – Degree of Homicide Distributions between Two Populations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Hillsborough County</strong></td>
</tr>
<tr>
<td>First Degree</td>
</tr>
<tr>
<td>Second Degree</td>
</tr>
<tr>
<td>Voluntary Manslaughter</td>
</tr>
<tr>
<td>Involuntary Manslaughter</td>
</tr>
</tbody>
</table>
The degrees of homicide were composed of both convictions and charges due to the awaiting trials of numerous defendants, thereby preventing convictions to be the sole factor for analysis. The Lincoln, Nebraska area showed a slightly different distribution then the Tampa, Florida area, because first degree homicides appeared 60.4% of the time, while second degree and involuntary manslaughter homicides had a similar distribution at 20.8% and 16.7%, respectfully. The Hillsborough County data revealed a more even distribution of homicides between the first (53.9%) and second degree categories (33.2%). However, the involuntary manslaughter (4.3%) and voluntary manslaughter (8.6%) categorizations were drastically lower.

These distributions show the majority of crimes within each community are premeditated murders. However, the Lincoln area has a higher percentage of involuntary murders, which may indicate a certain demographic and type crime being committed in this area, such as child abuse. In following sections, correlations to victim-offender relationships will be used to attempt to uncover the reason for the discrepancy.

The distribution of victim-offender relationships were also scrutinized using frequency charts. The relationships were compressed into three different categories: domestic, non-domestic, and stranger. Figure 4.7 illustrates the similarities seen in the distributions of victim-offender relationships that ended in murder.

Both counties show the non-domestic relationship as the foremost category in criminal homicides, followed by the domestic affiliation. The most interesting aspect of this frequency is the small role stranger homicides seem to play within each society. The lack of stranger homicides was not much of a surprise for the rural area, due to the smaller, more intimate setting of the community.
Figure 4.7 - Relevant Frequencies of Relationship Categories in Hillsborough and Lancaster Counties

Relationship Categories

Count

County

Hillsborough

Lancaster

Domestic  27.66%

Non-domestic  47.34%

Stranger  15.16%

0.82%

0  50  100  150  200  250

Relationship Categories
Yet, the urban setting of Hillsborough County was expected to have a much stronger representation of stranger homicides due to the population density and amount of population fluidity within the community. However, the Tampa data revealed less than one hundred cases (n=74) for the area (15.16%).

Victim precipitation is also a variable that showed different patterns during frequency analysis. In Table 4.8, the Lancaster County population showed a fairly equal distribution of known homicide cases (n=40) that did or did not have victim precipitation present. The results demonstrate 52.5% of the victim precipitation cases did not have the variable present prior to the murder event, while 47.5% of the cases did have victim precipitation occur. However, the Hillsborough County cases (n=373) showed a larger amount of distance between the two circumstances frequencies, because 60.9% of the cases had no victim precipitation and only 39.1% of the cases were categorized as the having the variable present.

The amount of cases, from each area, with victim precipitation present may indicate the relationship status of the involved individuals. The smaller amount of cases with victim precipitation in Hillsborough County may indicate non-domestic relationships that began as an altercation. Cross-tabulations of the variable and the relationship, as well as the degree of murder, are later performed to unveil the forces behind the divergences.

The frequency results for the victim’s mechanism of death showed an interesting social variable that differed between communities. (Table 4.9). By far, gunshot wounds were the most common mechanism of homicide in the Florida population (52.3%), followed by sharp force trauma (21.3%) and blunt force trauma (15.7%).
### Table 4.8 – Presence of Victim Precipitation Frequencies in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>39.1% (146/373)</td>
<td>47.5% (19/40)</td>
</tr>
<tr>
<td>Not Present</td>
<td>60.9% (227/373)</td>
<td>52.5% (21/40)</td>
</tr>
</tbody>
</table>

### Table 4.9 – Mechanism of Death Distributions in Homicide Cases from Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single GSW</td>
<td>31.7% (131/413)</td>
<td>29.8% (14/47)</td>
</tr>
<tr>
<td>Multiple GSW</td>
<td>20.6% (85/413)</td>
<td>12.8% (6/47)</td>
</tr>
<tr>
<td>Blunt Force Trauma</td>
<td>15.7% (65/413)</td>
<td>12.8% (6/47)</td>
</tr>
<tr>
<td>Sharp Force Trauma</td>
<td>21.3% (88/413)</td>
<td>29.8% (14/47)</td>
</tr>
<tr>
<td>Strangulation</td>
<td>6.3% (26/413)</td>
<td>14.8% (7/47)</td>
</tr>
<tr>
<td>Other</td>
<td>4.4% (18/413)</td>
<td>0.0% (0/47)</td>
</tr>
</tbody>
</table>

*GSW – Gunshot Wound
However, the Nebraska population revealed an equal reliance (29.8% each) on single gunshot wounds and sharp force trauma as means to commit murder. These mechanisms are then followed by strangulation, with a frequency of 14.9%.

Single gunshot wounds, sharp force trauma, and strangulation are all associated with intimate killing situations such as murder/suicide, women offenders, and crimes of passion. These mechanisms are at the forefront of the Nebraska cases, which allow an assumption to be made that domestic murders are a more common occurrence within the community. The Florida cases do not support this assumption for the community because of the overrepresented reliance on only single and multiple gunshot wounds.

The presence of drugs or alcohol during a homicide incident suggested differences in the role of abusive substances within each community. Table 4.10. Lancaster County homicides reveal a higher percentage for the presence of abusive substances (62.5%), during a homicide event. Conversely, Hillsborough County had similar percentages between the presence (47.7%) and absence (52.3%) of abusive substances, with the absence being more prevalent. These results indicate the Lancaster County community is committing homicides under the influence of a substance, which may result in a crime of passion rather than a planned murder.

The frequency outputs in this section show interesting factors between the criminal homicide cases in Hillsborough County, Florida and Lancaster County, Nebraska. Using the variable frequencies uncovered in this segment, further statistical analyses are conducted to explore and explain the differences in murder circumstances for each population.
Table 4.10 – Presence of Drugs or Alcohol for Homicide Cases in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>47.7% (115/241)</td>
<td>62.5% (20/32)</td>
</tr>
<tr>
<td>Not Present</td>
<td>52.3% (126/241)</td>
<td>37.5% (12/32)</td>
</tr>
</tbody>
</table>
Cross-tabulations and Chi-Square Tests

Due to the categorical nature of the majority of variables, cross-tabulations and chi-square tests of independence were the main methods for uncovering associations between data. Using the categories illustrated by frequency charts, case characteristics were used to learn more information about homicide patterns within each community.

Results of cross-tabulations for the degree of homicide in relation to victim-offender association revealed the offender was known more frequently with all degree levels within both populations. Table 4.11, Table 4.12, Figure 4.8 and Figure 4.9. All four degree categories, in each population, were lead by the “non-domestic” social relationship. Also, the cases labeled “domestic” were found to have over half of the murders classified as first degree, or premeditated, in both communities.

Demographically, both societies showed that males killed males in the majority of homicide cases, as well as the fact that males murder females more often than females kill each other or males. In addition, when related to domestic encounters, the two communities showed different victim ethnicity distributions.

As seen in Table 4.13, the Nebraska data reveals the majority of domestic victims were of European ancestry (80.0%), with no other ancestries involved except Asians (20.0%). The Florida population had most domestic victims fall within the European (54.4%) and African (33.6%) ancestries. Hispanics (15.0%) were also more highly represented as victims in the Florida population.

The domestic homicide offender’s ethnicity was also exposed using cross-tabulations.
Table 4.11 – Cross-tabulation of Degree of Homicide and Victim-Offender Relationship in Lancaster County

<table>
<thead>
<tr>
<th></th>
<th>Domestic</th>
<th>Non-domestic</th>
<th>Stranger</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Degree</strong></td>
<td>70.0%</td>
<td>55.9%</td>
<td>75.0%</td>
<td>(29)</td>
</tr>
<tr>
<td></td>
<td>(7)</td>
<td>(19)</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td><strong>Second Degree</strong></td>
<td>10.0%</td>
<td>23.5%</td>
<td>25.0%</td>
<td>(10)</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(8)</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td><strong>Voluntary Manslaughter</strong></td>
<td>0.0%</td>
<td>2.9%</td>
<td>0.0%</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>(0)</td>
<td>(1)</td>
<td>(0)</td>
<td></td>
</tr>
<tr>
<td><strong>Involuntary Manslaughter</strong></td>
<td>20.0%</td>
<td>17.6%</td>
<td>0.0%</td>
<td>(8)</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td>(6)</td>
<td>(0)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>(10)</td>
<td>(34)</td>
<td>(4)</td>
<td>(48)</td>
</tr>
</tbody>
</table>

Figure 4.8 - Degree of Homicide Comparison to Victim-Offender Relationship in Lancaster County
### Table 4.12 – Cross-tabulation of Degree of Homicide and Victim-Offender Relationship in Hillsborough County

<table>
<thead>
<tr>
<th></th>
<th>Domestic</th>
<th>Non-domestic</th>
<th>Stranger</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Degree</strong></td>
<td>60.0%</td>
<td>51.8%</td>
<td>50.0%</td>
<td>(226)</td>
</tr>
<tr>
<td></td>
<td>(75)</td>
<td>(114)</td>
<td>(37)</td>
<td></td>
</tr>
<tr>
<td><strong>Second Degree</strong></td>
<td>25.6%</td>
<td>36.4%</td>
<td>36.5%</td>
<td>(139)</td>
</tr>
<tr>
<td></td>
<td>(32)</td>
<td>(80)</td>
<td>(27)</td>
<td></td>
</tr>
<tr>
<td><strong>Voluntary Manslaughter</strong></td>
<td>9.6%</td>
<td>8.2%</td>
<td>8.1%</td>
<td>(36)</td>
</tr>
<tr>
<td></td>
<td>(12)</td>
<td>(18)</td>
<td>(6)</td>
<td></td>
</tr>
<tr>
<td><strong>Involuntary Manslaughter</strong></td>
<td>4.8%</td>
<td>3.6%</td>
<td>5.4%</td>
<td>(18)</td>
</tr>
<tr>
<td></td>
<td>(6)</td>
<td>(8)</td>
<td>(4)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>(125)</td>
<td>(220)</td>
<td>(74)</td>
<td>(419)</td>
</tr>
</tbody>
</table>
Table 4.13 – Victim Ancestry Compared to Domestic Homicides in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>54.4% (68/122)</td>
<td>80.0% (8/10)</td>
</tr>
<tr>
<td>African</td>
<td>33.6% (42/122)</td>
<td>0.0% (0/10)</td>
</tr>
<tr>
<td>Asian</td>
<td>0.0% (0/122)</td>
<td>20.0% (2/10)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15.0% (12/122)</td>
<td>0.0% (0/10)</td>
</tr>
<tr>
<td>American-Indian</td>
<td>0.0% (0/122)</td>
<td>0.0% (0/10)</td>
</tr>
<tr>
<td>Other</td>
<td>0.0% (0/122)</td>
<td>0.0% (0/10)</td>
</tr>
</tbody>
</table>
In Table 4.14, the Hillsborough County data, n=413, show a large distribution of European (50.4%) and African (38.2%) ancestries, in terms of domestic offenders. However, the Lancaster County data (n=43) exhibits more than three-fourths of the domestic offender population (80.0%) as having a European ancestral background.

Cross-tabulations of the degree of offense with both Hillsborough and Lancaster County offender age ranges show different results, comparatively. In Lancaster County a significant proportion of first degree homicides (55.6%) and second degree homicides (50.0%) were committed in the 20-29 age range (Figure 4.10 and Figure 4.11).

The Hillsborough County cross-tabulation revealed a similar proportion of the 20-29 age range to degree of homicide. However, the 10-19 year range, 30-39 year range, and 40-49 year age range also showed numerous amounts of first and second degree murders being committed. These differences reflect the demographic disparities between the two communities and the impacts they have on the rates of victims and offenders in domestic homicides.

Chi-square tests for independence, when paired with cross-tabulations, are effective statistical methods in crime analysis. A chi-square test of independence determines if “the observed frequency of observations…is significantly different from those proposed by a null hypothesis” (Madrigal 1998:196). Implementing this technique, significant results are found between different variables within each social context. For example, in each community, females were found to be the more likely victim in a domestic murder, but males were more likely victims in non-domestic murders.
Table 4.14 – Offender Ancestry Compared to Domestic Homicides in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough County</th>
<th>Lancaster County</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>50.4% (62/123)</td>
<td>80.0% (8/10)</td>
</tr>
<tr>
<td>African</td>
<td>38.2% (47/123)</td>
<td>10.0% (1/10)</td>
</tr>
<tr>
<td>Asian</td>
<td>0.0% (0/123)</td>
<td>10.0% (1/10)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>11.4% (14/123)</td>
<td>0.0% (0/10)</td>
</tr>
<tr>
<td>American-Indian</td>
<td>0.0% (0/123)</td>
<td>0.0% (0/10)</td>
</tr>
<tr>
<td>Other</td>
<td>0.0% (0/123)</td>
<td>0.0% (0/10)</td>
</tr>
</tbody>
</table>
Figure 4.11 - Degree of Homicide Compared to Offender Age Range for Hillsborough County

Age Ranges
- 0: 0-9
- 1: 10-19
- 2: 20-29
- 3: 30-39
- 4: 40-49
- 5: 50-59
- 6: 60-69
- 7: 70-79
- 8: 80-89
- 9: 90-99
Therefore, chi-square analyses for each location exposed a significant difference in victim sex based on a domestic or non-domestic murder (Florida: $\chi^2 = 81.095$, $df = 1$, $p < 0.001$, Nebraska: $\chi^2 = 3.846$, $df = 1$, $p = 0.050$).

Also, both locales had similar intra-ethnic murder rates since the majority of cases in each city had an individual from one ethnicity kill an individual from the same ethnic category. Chi-square tests of intra-ethnic murders demonstrate these results as $\chi^2 = 725.689$, $df = 15$, $p < 0.001$ for the Tampa area and $\chi^2 = 64.002$, $df = 20$, $p < 0.001$ as results for the Lincoln area. Each output indicates a significant difference between the victim and offender ethnicities, suggesting that intra-racial homicide exists most frequently in each population.

Weapon choice between an offender’s sex was significantly different in the Hillsborough County sample ($\chi^2 = 21.119$, $df = 7$, $p = 0.004$). These chi-square results characterize Florida female offenders as sharp object wielders for weapon, while male Floridian offenders most often used guns. The Nebraska sample was unable to be analyzed for this relationship due to the insufficient sample size of female offenders.

The prevalence of murder/suicides and the relationships under which they occur were scrutinized using chi-square tests and crosstabulations as well. However, the Lancaster County data contained only two murder/suicide cases, and therefore, could not be analyzed. Nonetheless, the Hillsborough County data divulged significant results in the form of murder/suicides occurring between particular social relationship categories. Over the 10 year span, 41 murder/suicides occurred in the area in which 85.4% of the cases were committed by an offender in the “domestic” relationship category. The chi-square test for these variables was calculated as: $\chi^2 = 66.518$, $df = 2$, $p < 0.001$. 

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These results were interpreted to indicate a significant difference between close relationships committing murder/suicides and those who are not considered “domestic” and do not commit the act.

Lastly, Tables 4.15 and 4.16 illustrate the environment in which the victim’s body was recovered, in association to the relationship category to which the offender belonged. In Figures 4.12 and 4.13, the Hillsborough County cases show the majority of bodies found in public places were homicides committed by known individuals (49.3%), while bodies found in private residences were mostly committed by the domestic (42.4%) or non-domestic (51.6%) categories. Few corpses were recovered in the other environments, including only two cases at abandoned structures, which were both committed by “non-domestic” offenders.

The Lancaster County data discloses a different distribution of locations, since only the public area and private residences had significant amounts of recoveries. Homicides committed by a person in a domestic relationship had a single body recovery site, a private residence (n=10). Non-domestic relationships that ended in homicide were found in either a private residence (n=12) or public space (n=12). Interestingly, 66.7% of stranger homicides had a body recovered within a residence. This suggests that strangers who commit murder in the Nebraska community target or attack victims within their own homes, instead of in public locations.

Chi-square tests used to analyze these data established a significant difference between body recovery site within the Tampa area, $\chi^2 = 86.095$, $df=8$, $p < 0.001$. However, the Lincoln area did not prove to have significantly different body recovery sites, possibly due to the smaller sample sizes within each location.
Table 4.15 – Victim-Offender Relationship Compared to Recovery Location in Hillsborough County

<table>
<thead>
<tr>
<th>Recovery Location</th>
<th>Domestic</th>
<th>Non-domestic</th>
<th>Stranger</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Space</td>
<td>11.5%</td>
<td>49.3%</td>
<td>39.2%</td>
<td>130</td>
</tr>
<tr>
<td>Private Residence</td>
<td>42.4%</td>
<td>51.6%</td>
<td>6.0%</td>
<td>217</td>
</tr>
<tr>
<td>Along Roadside</td>
<td>16.7%</td>
<td>66.6%</td>
<td>16.7%</td>
<td>24</td>
</tr>
<tr>
<td>Wooded Area/ Field</td>
<td>26.1%</td>
<td>69.6%</td>
<td>4.3%</td>
<td>23</td>
</tr>
<tr>
<td>Abandoned Structure</td>
<td>0.0%</td>
<td>100.0%</td>
<td>0.0%</td>
<td>2</td>
</tr>
<tr>
<td>Railroad Tracks</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>210</td>
<td>69</td>
<td>396</td>
</tr>
</tbody>
</table>

Figure 4.12 - Victim-Offender Relationship Compared to Body Recovery Location in Hillsborough County
Table 4.16 – Victim-Offender Relationship Compared to Recovery Location in Lancaster County

<table>
<thead>
<tr>
<th></th>
<th>Domestic</th>
<th>Non-domestic</th>
<th>Stranger</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Space</td>
<td>0.0%</td>
<td>92.3%</td>
<td>7.7%</td>
<td>(13)</td>
</tr>
<tr>
<td>Private Residence</td>
<td>40.0%</td>
<td>52.0%</td>
<td>8.0%</td>
<td>(25)</td>
</tr>
<tr>
<td>Along Roadside</td>
<td>0.0%</td>
<td>100.0%</td>
<td>0.0%</td>
<td>(3)</td>
</tr>
<tr>
<td>Wooded Area/ Field</td>
<td>0.0%</td>
<td>100%</td>
<td>0.0%</td>
<td>(2)</td>
</tr>
<tr>
<td>Abandoned Structure</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>(0)</td>
</tr>
<tr>
<td>Railroad Tracks</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>(0)</td>
</tr>
<tr>
<td>Other</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>(0)</td>
</tr>
<tr>
<td>Total</td>
<td>(10)</td>
<td>(30)</td>
<td>(3)</td>
<td>(43)</td>
</tr>
</tbody>
</table>

Figure 4.13 - Victim-Offender Relationship Compared to Recovery Location in Lancaster County
Each cross-tabulation and chi-square result reveals a fact pertinent to the homicide cases for each location. The results are important for expanding research questions by using sophisticated statistical tests, as well as providing predictive factors. Interestingly, victim precipitation was not seen as an important variable in the analyses for these communities, unlike many previous studies.

Comparison of Means

Comparing the means of particular case characteristics to the offender’s age, and processing them with an analysis of variance (ANOVA), allows the researcher to draw conclusions about the factors involved with the production of criminal homicides. The tests in this section pertain to the offender’s age, which was compared to the degree of murder, the occurrence of murder/suicide, and the category of relationship for each location.

The results for the degree of murder comparison proved that age did not significantly influence the type of murder committed in either community. The ANOVA calculated a $p$-value of 0.456 for the Nebraska data and $p=0.545$ for the Florida data. The murder/suicide factor, however, is associated with the offenders’ age at the Florida site. The Nebraska site was unable to be tested on account of the small murder/suicide sample size ($n=2$). The Hillsborough County sample ($n=46$) of murder/suicide occurrences established a mean age of 45.38 years old for offenders who commit this particular crime ($n=39$). The ANOVA test supports the significance through the results: $F=41.637$, $df=1$, 161, and $p < 0.001$. The ethnicity of the offender could not be compared to prevalence of
murder/suicides in Hillsborough County because of the small sample sizes for some of the ethnicity categories.

The last test compared the age of the offender to the three collapsed categories of social relationships. The Nebraska data did not yield a considerable difference of age between social relationships in criminal homicides; however, the Florida data provided significant results. Mean ages of the offender within each category are seen in Table 4.17. The ANOVA produced for this dataset revealed statistics of: \( F=15.964, \ df=6, \ 234, \) and \( p < 0.001. \) Therefore, the age of an offender is an important variable to consider when categorizing or predicting the type of relationship the victim had with their killer.

**Pearson Correlations**

Results for the Tampa area data confirm a correlation between the offender and victim ages with a \( p < 0.001 \) and a Pearson correlation value of \( r=0.393. \) The median age of victims in this dataset was 33.00 years old, while the median age of offenders was 29.00 years old. This shows that the offenders in the urban area were usually younger than their victims. However, it must be noted that a small group of offenders that were older are connected with a small sample of extremely young victims. This grouping represents the adults who committed child homicides within the 10 year period.

The Lancaster County data for victim and offender ages also proved to have a significant correlation. A median age of 29.00 years old was calculated for victim age, whereas 25.50 was the median age found for offenders from this region. The results of a computed Pearson correlation was \( r=0.370, \) with a \( p=0.011. \) Figure 4.14 illustrates the correlation.
Table 4.17 – Mean Ages of Offenders by Social Relationship Category to Victims in Hillsborough County

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Age</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>37.38 (n=122)</td>
<td>14.360</td>
</tr>
<tr>
<td>Non-Domestic</td>
<td>31.91 (n=218)</td>
<td>13.097</td>
</tr>
<tr>
<td>Stranger</td>
<td>26.56 (n=71)</td>
<td>10.553</td>
</tr>
<tr>
<td>Total</td>
<td>32.61 (n=411)</td>
<td>13.565</td>
</tr>
</tbody>
</table>

Figure 4.14 - Hillsborough County Age Correlation between Victim and Offender

: $R^2$ Linear = 0.154
As within the Hillsborough correlation, Figure 4.15, the age of offenders are slightly younger than males, as well as a few cases represented in the graph that indicate an older offender killed a child. However, it should be noted that there is a number of possible outliers in the upper left quadrant of the correlation. Both Figures 4.14 and 4.15 use linear lines to illustrate the pattern of ages within each community.

GIS Results

In addition to the statistical analysis, ArcGIS 3.2 software was employed to plot the significant murder cases in each area and compare the spatial geometry and distances. The mapped cases are then subjected to social relationship correlations to reveal underlying social structures that indicate a particular spatial distribution of scenes in criminal homicides per population.

The states of Florida and Nebraska, their major roadways, and major cities are seen in Figure 4.16. To plot the locations for each case, geocoding is employed and a symbol is placed on the maps according to its physical address. During the analysis of the homicide scenes, two interesting spatial patterns emerged from the configuration frequencies in both counties. Table 4.18.

After reviewing and comparing the relevant frequencies, it was found that the most significant cases between the areas of study were those that contained disposal sites, and those in which the victim and offender resided together, but the murder occurred outside the home. Murders with body disposal sites, other than the murder site itself, were seen in both Hillsborough County (n=20) and Lancaster County (n=6), (Figure 4.17 and 4.18).
### Table 4.18 – Frequency of Geometric Situations in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Hillsborough</th>
<th>Lancaster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim Alone</td>
<td>Solid Blue Rectangle</td>
<td>23.2% (198/853)</td>
</tr>
<tr>
<td>Offender Alone</td>
<td>Solid Red Triangle</td>
<td>25.7% (219/853)</td>
</tr>
<tr>
<td>Murder Alone</td>
<td>Solid Green Star</td>
<td>20.8% (177/853)</td>
</tr>
<tr>
<td>Disposal Alone</td>
<td>Solid Purple Pentagon</td>
<td>2.3% (20/853)</td>
</tr>
<tr>
<td>Victim/Murder</td>
<td>Dotted Blue Rectangle</td>
<td>8.9% (76/853)</td>
</tr>
<tr>
<td>Offender/Murder</td>
<td>Dotted Red Triangle</td>
<td>5.0% (43/853)</td>
</tr>
<tr>
<td>Victim/Offender</td>
<td>Dotted Yellow Hexagon</td>
<td>0.5% (4/853)</td>
</tr>
<tr>
<td>All</td>
<td>Dotted Orange Circle</td>
<td>12.9% (110/853)</td>
</tr>
</tbody>
</table>

---

Figure 4.15 - Lancaster County Age Correlation between Victim and Offender

- $R^2$ Linear = 0.137
However, the spatial configuration of co-habitations with an outside murder location was only seen, although rarely, in Hillsborough County (n=3). Figure 4.18. Both of these unusual spatial patterns are then associated with social relationship categories to unveil the occurring victim-offender relationships.

The disposal site cases are subjected to the collapsed relationship categories: domestic, non-domestic, and stranger. However, the co-habitation cases are all considered to be in the “domestic” category, and therefore are correlated with the more specific components of the collapsed category. The intent of the association is to determine the type of offenders committing these specific crimes. This relationship analysis can help law enforcement personnel focus on the homicide suspects related to the victims, in accordance with the specific situations and the indicated offender.

After mapping the cases, vector lines are used to connect the scenes in each case to determine the spatial geometry. Distances, in miles, between each scene are computed using the geometric calculation function in ArcGIS 3.2. The mean distance to each scene, within the study areas, is then determined and compared. (Table 4.19).

The range of distances in the Hillsborough County disposal cases were 0.05 miles to 103.17 miles. Lancaster County disposal site distances ranged from 0.4 miles to 37.89 miles. The co-habitation cases in Hillsborough County had a distance range of 0.95 miles to 12.69 miles.

The average distances for each county expose that only the murder-disposal site distance are similar. All other distances show the Hillsborough County scenes are much farther in distance than the Lancaster County scenes. This discrepancy between populations may be due to the mobility of each area and the population density.
Figure 4.18

Hillsborough County Co-habitation Homicides with other Murder Sites
Table 4.19 – Average Distance in Miles from Specific Locations in Hillsborough and Lancaster County Disposal Cases

<table>
<thead>
<tr>
<th></th>
<th>Hillsborough</th>
<th>Lancaster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim-Offender</td>
<td>19.51 miles (n=11)</td>
<td>5.16 miles (n=4)</td>
</tr>
<tr>
<td>Offender-Murder</td>
<td>18.21 miles (n=4)</td>
<td>1.58 miles (n=1)</td>
</tr>
<tr>
<td>Murder-Victim</td>
<td>11.81 miles (n=6)</td>
<td>0.9 miles (n=1)</td>
</tr>
<tr>
<td>Murder-Disposal</td>
<td>12.49 miles (n=14)</td>
<td>13.37 miles (n=3)</td>
</tr>
<tr>
<td>Offender-Disposal</td>
<td>10.62 miles (n=7)</td>
<td>6.07 miles (n=3)</td>
</tr>
<tr>
<td>Victim-Disposal</td>
<td>12.22 miles (n=15)</td>
<td>3.96 miles (n=5)</td>
</tr>
</tbody>
</table>
In Tables 4.20 and 4.21, the frequency distributions of the location distances are grouped by five mile increments. These increments are discussed to simplify the distributions of the disposal and co-habitation cases in each area of study. Associations of the disposal and co-habitation cases, for each county, to the victim-offender relationship are then conducted. Frequencies of the relationships for each type of case are seen in Tables 4.22, 4.23 and Figure 4.19. The disposal cases are associated with the three collapsed relationship categories, whereas the co-habitation cases are compared to the relationships that comprise the “domestic” category.

The cases with disposal sites had similar distributions between counties. Hillsborough County and Lancaster County had an equal amount of domestic and non-domestic relationships that fielded disposal sites away from the murder. Only one disposal case with a “stranger” relationship between the victim and offender was seen in each area of study. The Lancaster County dataset had one case in which the victim-offender relationship was unknown, and therefore set in a separate category.

The implications of the relationship results suggest that offenders who know the victim, whether intimately or casually, are more prone to move the body after the murder event, regardless of an urban or rural location. This is consistent with both Van Patten and Delhauer’s (2007) and Hakkanen and colleagues’ (2007) research, which also concluded that disposal sites were sought out more often when the offender knew the victim. Lancaster County did not reveal any cases with the co-habitation configuration, although the data from Hillsborough County had three. The victim-offender relationship of the co-habitation cases suggests spouses and significant others kill their spouses after intense planning or with the intention of killing themselves and fail.
### Table 4.20 – Frequencies of Distances in Miles from Specific Locations in Hillsborough County Disposal Cases

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Within 5 Miles</th>
<th>5-10 Miles</th>
<th>More than 10 Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim-Offender</td>
<td>36.3% (4/11)</td>
<td>36.3% (4/11)</td>
<td>27.4% (3/11)</td>
</tr>
<tr>
<td>Offender-Murder</td>
<td>50.0% (2/4)</td>
<td>0.0% (0/4)</td>
<td>50.0% (2/4)</td>
</tr>
<tr>
<td>Murder-Victim</td>
<td>33.3% (2/6)</td>
<td>16.7% (1/6)</td>
<td>50.0% (3/6)</td>
</tr>
<tr>
<td>Murder-Disposal</td>
<td>64.3% (9/14)</td>
<td>0.0% (0/14)</td>
<td>35.7% (5/14)</td>
</tr>
<tr>
<td>Offender-Disposal</td>
<td>57.1% (4/7)</td>
<td>14.3% (1/7)</td>
<td>28.6% (2/7)</td>
</tr>
<tr>
<td>Victim-Disposal</td>
<td>26.7% (4/15)</td>
<td>33.3% (5/15)</td>
<td>40.0% (6/15)</td>
</tr>
</tbody>
</table>

### Table 4.21 – Frequencies of Distance in Miles from Specific Locations in Lancaster County Disposal Cases

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Within 5 Miles</th>
<th>5-10 Miles</th>
<th>More than 10 Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim-Offender</td>
<td>40.0% (2/5)</td>
<td>60.0% (3/5)</td>
<td>0.0% (0/5)</td>
</tr>
<tr>
<td>Offender-Murder</td>
<td>100.0% (1/1)</td>
<td>0.0% (0/1)</td>
<td>0.0% (0/1)</td>
</tr>
<tr>
<td>Murder-Victim</td>
<td>100.0% (1/1)</td>
<td>0.0% (0/1)</td>
<td>0.0% (0/1)</td>
</tr>
<tr>
<td>Murder-Disposal</td>
<td>66.6% (2/3)</td>
<td>0.0% (0/3)</td>
<td>33.3% (1/3)</td>
</tr>
<tr>
<td>Offender-Disposal</td>
<td>33.3% (1/3)</td>
<td>66.6% (2/3)</td>
<td>0.0% (0/3)</td>
</tr>
<tr>
<td>Victim-Disposal</td>
<td>60.0% (3/5)</td>
<td>20.0% (1/5)</td>
<td>20.0% (1/5)</td>
</tr>
</tbody>
</table>

### Table 4.22 – Victim-Offender Relationship Frequencies for Disposal Cases in Hillsborough and Lancaster Counties

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Hillsborough</th>
<th>Lancaster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>45.4% (5/11)</td>
<td>33.3% (2/6)</td>
</tr>
<tr>
<td>Non-domestic</td>
<td>45.4% (5/11)</td>
<td>33.3% (2/6)</td>
</tr>
<tr>
<td>Stranger</td>
<td>9.1% (1/11)</td>
<td>16.7% (1/6)</td>
</tr>
<tr>
<td>Unknown</td>
<td>0.0% (0/11)</td>
<td>16.7% (1/6)</td>
</tr>
</tbody>
</table>
Table 4.23 – Cross-tabulation of Victim-Offender Relationship with Degree of Murder in Co-habitation Cases from Hillsborough County

<table>
<thead>
<tr>
<th></th>
<th>Spouse</th>
<th>Boyfriend/Girlfriend</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Degree</td>
<td>0.0% (0/1)</td>
<td>100.0% (2/2)</td>
</tr>
<tr>
<td>Second Degree</td>
<td>100.0% (1/1)</td>
<td>0.0% (0/2)</td>
</tr>
<tr>
<td>Voluntary Manslaughter</td>
<td>0.0% (0/1)</td>
<td>0.0% (0/2)</td>
</tr>
<tr>
<td>Involuntary Manslaughter</td>
<td>0.0% (0/1)</td>
<td>0.0% (0/2)</td>
</tr>
</tbody>
</table>
When cross-tabulated with degree of murder, the individuals who killed their significant others were both charged with first degree murder, while the spousal offender was charged with second degree murder. (Table 4.24).

The use of GIS, distance comparisons, and social relationship associations in criminal analyses allow law enforcement personnel to gain a better understanding of the crimes and the movement seen within them. Comparisons between urban and rural communities are also an important aspect for law enforcement agencies when analyzing the crimes in their locations. Anthropology is well suited for this because it employs a holistic perspective that can be used to recognize the differences between larger, more mobile communities, such as Hillsborough County, and the smaller, less fluid populations like Lancaster County.
Table 4.24 – Victim-Offender Relationship Frequencies for Co-habitation Cases in Hillsborough County

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse</td>
<td>66.7% (2/3)</td>
</tr>
<tr>
<td>Parent</td>
<td>0.0% (0/3)</td>
</tr>
<tr>
<td>Child</td>
<td>0.0% (0/3)</td>
</tr>
<tr>
<td>Boyfriend/Girlfriend</td>
<td>33.3% (1/3)</td>
</tr>
</tbody>
</table>

Chapter 5

Discussion

The analyses of this study have divulged interesting results in terms of urban and rural homicide activities and the people who are involved in them. Hillsborough and Lancaster Counties have similar characteristics in some aspects, and diverge in others. The implications of these similarities and differences are reviewed and discussed in terms of urban and rural community structures and social relationships.

Both populations showed a number of similar results, including the relevant frequencies of victim-offender relationships, the frequencies of the types of charges and convictions, the sex of the victim in reference to relationship of the offender, as well as age differences and ethnic similarities between victims and offenders. First degree murders were seen as the most common type of homicide and intra-ethnic murders were most frequent in both locations. Van Patten and Delhauer (2007) and Lauritsen and Schaum (2004) both found connections to inter-ethnic murder and therefore these findings were expected based on the literature. However, the lack of inter-ethnic murders in the urban area was found to be contradictory to the expected high frequency. The population density and composition of the urban community were the reasons supporting the expectation.

Also, females were killed more often than males in domestic homicides, while males were more frequently killed in non-domestic or stranger homicides. Therefore, the victim’s sex was a noteworthy factor in victim-offender relationships. The sex results
coincide with the literature of previous researchers and were not expected to be different between populations. In addition, both communities showed the highest frequency of victim-offender relationships as the non-domestic category, followed by domestic then stranger. This finding is surprising and contradictory to the original hypothesis for the urban area was expected to have a more significant amount of stranger homicides, whereas the rural area was expected to have a higher frequency of domestic homicides. The hypothesis was based on the population density data and the social mobility seen within each. However, these conclusions are synonymous to Curtis’ (1974) results since his study suggested “stranger” incidents accounted for less 30% of urban homicides.

Lastly, the age differences between the victim and offender proved to be an important factor within each population, since the offender was primarily younger than the victim. This was unexpected due to the prediction of more “stranger” homicides in the urban area, including gang activity and random disputes. However, the previous research has yielded information pertaining to this age association, and therefore is not questioned or discarded.

Although many variables did not have any differences between the study sites according to location or community structure, other variables showed interesting disparities. The demography of the victims and offenders did not prove to be different between the communities, however there were discrepancies. The age of the offender in the rural population was concentrated mainly on the 20-29 year range, whereas the urban population’s frequency distribution was more evenly distributed for age. Hillsborough County was expected to have a more diverse offender age range due to the size of the population and number and type of criminal homicides being committed.
Offender ethnicity between communities also revealed interesting and differing frequencies, because Lancaster County showed all ethnicities participating in murder. Hillsborough County offenders, however, were more concentrated on the European and African ancestries. In addition, the victim ethnicity was dissimilar across populations, for the Florida community had a more even distribution across the European, African, and Hispanic ethnicities, whereas victims from Nebraska had a higher concentration of Europeans within the dataset. The wide variety of ethnic populations in a large, urbanized area accounts for the Hillsborough County frequency. Rural areas are not seen to be as diverse, and therefore it is expected the ethnicity of victims would be more concentrated.

Victim precipitation proved to be an extremely interesting variable, since the Hillsborough data had little victim precipitation within its homicides as well as less stranger homicide. However, the Nebraska data had a 50% split of cases that did and did not have victim precipitation. The lack of victim precipitation may be the factor that dampens the amount of stranger homicide happening in the urban population.

Wolfgang (1967) relied heavily on the factor of victim precipitation in his study. However, the data analyzed in the current project was not found to extremely affect the production of homicide within each community. The constantly changing social dynamics of urban communities and the rise of mobility in rural communities could explain this discrepancy; therefore, victim precipitation should not be excluded from expanding studies.

Mechanisms of death, such as strangulation and sharp force trauma, are seen as intimate categories of homicide, and are found frequently in the Nebraska population.
Conversely, gunshot wounds account for the majority of death mechanisms in the Florida population. These factors may indicate differences in community structures, for the rural population has the potential to know each other more than the urban area due to the size of the total population. Also, the vast social mobility of the urban population could account for the less intimate killings.

When comparing domestic cases to offender ancestry, Lancaster County offenders were associated mostly with the European ethnicity. On the other hand, Hillsborough County offenders had a fairly equal distribution between European and African, again supporting the notion of urban diversification.

The GIS results of disposal and co-habitation cases from each population also exposed similarities and differences in the spatial distribution of scenes. For disposal cases, the range of distances was much greater in the urban area most likely due to the greater mobility and transient nature of the population. In contrast, the Nebraska disposal cases had a very limited mobility range. This is an interesting fact, for the landscape of Nebraska is much more open and less developed than urbanized Florida. Therefore, the factors hindering a farther disposal site in the rural area should be studied further.

Co-habitation cases in which a murder took place outside of a shared residence were only found in the urban population. This situation may be localized to urban communities due to the amount of increased opportunities an offender has to remove him or herself and their victim from a shared residence in order to commit the crime. However, the social implications of this phenomenon are unclear, and should be additionally researched. The range of distances for these cases was very limited, only approximately 11 miles at the most. However, the sample size was extremely small.
(n=3) and therefore is also subject to further investigation. Also, the mean distances in miles from scene to scene showed a much larger spatial distribution in Hillsborough County than Lancaster County. Again, the mobility of these areas and the transient or non-transient nature of their residents most likely account for this movement.

When related with specific location distances, condensed to five mile increments, the frequencies of distance between the two sites were discovered. The urban population revealed a fairly equal amount of cases happening at the 5, 10, and greater than 10 mile increments when looking at the vicinity of the victim to offender residences. However, the expanses of victim to offender residences in Lancaster County were always seen within 10 miles from each other. The offender’s residence to the murder location and victim’s residence to the murder scene showed regional distance variation as well. The Lancaster County cases all confirmed a distance of less than five miles from the offender’s house to the murder site, as did the distance from the victim’s house to the murder location. This proximity is interesting because the close range of victim to offender corresponds to the more intimate relationship category in homicides. Domestic and non-domestic murders are expected to occur between persons that are within a close distance to each other, due to the intimate social nature of their relationship. These more intimate relationships are seen in high frequency within the Lancaster County data, thereby supporting the statistical outcome.

The results from the Lancaster County data support the conclusions made by Messner et al. (1999) and Santtila et al. (2007), since spatial randomness was not seen to exist in the rural community. In addition, the corresponding distances to social relationships make it possible to identify specific crime features.
In contrast, Hillsborough County was evenly split between the less than five mile increment and the over 10 mile increment when calculating the distance from the offender’s house to the murder site. Also, the Florida data disclosed the victim’s residence as over 10 miles away from the murder site in 50% of the cases. The other half were mostly within a five mile radius. These differences can be explained with the population structures and size of the communities themselves. The highly mobile circumstances surrounding the populated Tampa area allows people to more easily connect with each other, despite a lengthy distance. Again, this supports Messner and co-researchers’ work (1999) for spatial randomness in homicides was not seen in the Tampa area. Yet the factors were too widespread to relate to Santtila et al. (2007) and their identification of specific features of crime. However, it should be noted that the sample sizes of the disposal and co-habitation cases in the areas of study are extremely small and should be examined more closely and with greater sample sizes to expose any generalized spatial patterns.

Lastly, a few cases showed interesting social relationship patterns after being associated to other variables. The disposal cases were evenly split between the domestic and non-domestic categories in both counties; Hillsborough (45.4% each) and Lancaster (33.3% each). Similarly, in each area, only one documented case of body disposal occurred from a “stranger” relationship with the victim. In addition, the co-habitation cases found in Hillsborough County were analyzed with the components that were included in the “domestic” category which revealed two relationships in which the particular situation occurred. Only the spousal and significant other group had cases that demonstrated this particular spatial configuration, with the spousal category having one
more case. However, the sample sizes of the particular configurations must again be noted, because the frequency of these cases is not enough to begin making generalizations about spatial movement within urban and rural communities.
Chapter 6

Conclusion and Recommendations

This project focuses on the importance of social relationships, and the spatial distributions affected by them, within specific community contexts to approach crime analysis in a holistic manner. Criminal homicides are a significant part of organized societies, and although many efforts are made to prevent them, success is not always achieved. By using the information provided, along with further research, law enforcement agencies have the opportunity to incorporate the social structure of the population, the victim-offender relationship, and the means by which scenes related to the homicide event are generally distributed as a new paradigm in crime analysis.

The results of the current project indicate specific populations’ structures that actively influence criminal homicides. Age, sex, community mobility and fluidity, and the social relationships between a victim and offender have all proved to have impact on homicide rates. Age is a large component in the production of homicides, for the rate of the crime drastically drops after an age of 30. In urban areas, the roles of gang violence and social unrest increase these rates, and provide stronger evidence for the effects of age on the production of violence.

The role that and individual’s sex plays in the production of violence is also a strong component. A community’s sex ratio can depend on the rate of violence seen in that area. The extremely low frequencies of female offenders indicate that a community with a higher ratio of women would be a more passive population. However, if the sex
ratio is heavily weighted toward males, the population is at risk of a higher rate of homicide. The passive or aggressive nature of the sexes has the ability to greatly affect the amount of violence within a community.

Furthermore, the roles of migration and tourism also affect the social production of violence. The unstable population density and demographics of a fluid community can create situation more conducive to violence. The Hillsborough County data in the current study had a much larger sample size (n=420) of homicide cases within the 10 year span than the Lancaster County data (n=48). The amount of population density in an urban area can cause arguments and violence to occur naturally; however, when tourism, migration, and homelessness are added, the structure of the community is disrupted. This disruption can cause more conflict and violence to arise, thereby increasing the rates of homicide.

Suggestions for similar studies in the future involve the inclusion of more social variables of the individuals and communities. For example, the actual socio-economic status of both the victim and offender could shed light on the social factors that influence homicide, such as social segregations and economic impacts on crime rates. The previous criminal records of persons, whether victim or offender, involved in homicide cases could also validate and explain the situations and social affiliations in which they are involved. A history of violence may help raise awareness of some criminals’ actions, as well as help to understand the type of social network with whom they associate. Incorporating other urban and rural areas could also improve the dataset, because it would give a broader picture of the population structures and the spatial distributions seen among each form of community.
Limitations of the current study include the lack of statistical tests for the Nebraska population due to a small sample size. Although the study spanned a period of 10 years, the deficit of homicide related crimes did not allow a thorough analysis. Additionally, the small sample sizes of both the significant communities are problematic when attempting to relate the nature and spatial distributions of these crimes to other societies.

The current paper reflects the emerging importance of applied anthropology in public service fields such as criminal investigation. The use of human relationships and community structures help to unveil the cultural issues surrounding homicide events. Although further research must be conducted to prepare a definitive method of tracking and predicting homicide factors within both an urban and rural community, this research allows for a solid base on which to build an applied anthropology tool for methods of crime analysis.

Although the data and results presented in the current paper do not reflect staggering differences between the urban and rural community studied, it does reveal factors that could prove interesting with further investigation. Furthermore, the Tampa and Lincoln areas are thoroughly neglected in research, and have much to contribute to the academic and practical world. Overall, this research project is considered a success in uncovering the social aspects of an urban and rural environment that affect the spatial distributions and the populations involved in criminal homicides.
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Appendices
Appendix A

Spatial Analysis of Crime Scene Locations in Cases of Criminal Homicide, 1997-2007

Data Collection Protocol
Last Mod. April 2008
E.H. Kimmerle, Ph.D.

Research Collaborators:
Casey C. Anderson, MA Student, Dept. Anthropology
Hillsborough Co. Sheriff Dept.; Tampa Police Department; Temple Terrace Police Department;
Nebraska Institute of Forensic Sciences, Inc.

Introduction:
Data is collected for criminal homicides and manslaughter and therefore excludes justifiable or lawful homicide or vehicular homicide. Data should be collected for each victim or each assailant when more than two people are involved.

Definitions:
First-degree murder consists of both premeditation and malice aforethought.

Second-degree murder there is malice aforethought without premeditation. In other words, the offender intends to kill the victim but does not plan the lethal act.

An act of voluntary or non-negligent manslaughter is committed when a person attempts to hurt, but not kill, another human being—but the victim dies in the process. Negligent or involuntary manslaughter is characterized by accidental death. Some states distinguish between vehicular and non-vehicular accidental death and others do not.

"Victim precipitated" homicide refers to those instances in which the victims' actions resulted in their demise. In this form of murder, the deceased may have made a menacing gesture, was first to pull a weapon, or merely used words to elicit a deadly response from the killer.
"Hate" homicide is a form of killing involving taking the life of "victims who are targeted because they differ from the perpetrator with respect to such characteristics as race, religion, ethnic origin, sexual orientation, gender, or disability status" (Fox and Levin 2001, p. 128).
### Appendix A Continued

**DATE AND RECORDER:**

**POLICE AGENCY:**

**POLICE REPORT NO.:**

**AUTOPSY NO.:**

**DATE OF INCIDENT:**

**DATE/YEAR OF POLICE REPORT:**

### OBS. 01: TYPE OF HOMICIDE:

1 = criminal homicide, first degree  
2 = criminal homicide, second degree  
3 = manslaughter, negligent/involuntary  
4 = manslaughter, non-negligent/voluntary

### CONTEXT:

**OBS. 02** Was this a "victim precipitated" homicide?  
1 = Yes  2 = No  3 = Unknown

**OBS. 03** Was this a "hate murder"?  
1 = Yes  2 = No  3 = Unknown

**OBS. 04** Was this a domestic dispute or familial killing?  
1 = Yes  2 = No  3 = Unknown

**OBS. 05** Was there an associated robbery?  
1 = Yes  2 = No  3 = Unknown

**OBS. 06** Was there an associated rape?  
1 = Yes  2 = No  3 = Unknown

**OBS. 07** Was this a sexual homicide?  
1 = Yes  2 = No  3 = Unknown

**OBS. 08** Was there extortion?  
1 = Yes  2 = No  3 = Unknown

**OBS. 09** Was there an associated kidnapping?  
1 = Yes  2 = No  3 = Unknown

**OBS. 10** Was the assailant known by the victim?  
1 = Yes  2 = No  3 = Unknown

**OBS. 11:** What was the nature of the assailant’s relationship to the victim?  
1 = stranger  2 = spouse (married, separated, divorced)  3 = parent  
4 = child  5 = boyfriend/girlfriend  6 = coworker  
7 = neighbor  8 = other: (list)  9 = unknown

**OBS. 12:** Was the victim a prostitute?  
1 = Yes  2 = No  3 = Unknown

**OBS. 13:** If yes, was assailant any of the following?  
1 = prostitute  2 = pimp  3 = client

### Demographic Information of Decedent (repeat if multiple victims):

**OBS. 14:** Sex  
1 = Male  2 = Female

**OBS. 15:** Age (years)

**OBS. 16:** Ancestry:  
1 = Caucasian  4 = Hispanic  6 = Other (list)  
2 = African-American  5 = American-Indian  7 = Unknown  
3 = Asian

### Demographic Information of Offender (repeat if multiple assailants):

**OBS. 17:** Sex  
1 = Male  2 = Female

**OBS. 18:** Age (years)

**OBS. 19:** Ancestry:  
1 = Caucasian  4 = Hispanic  6 = Other (list)  
2 = African-American  5 = American-Indian  7 = Unknown  
3 = Asian

111
Appendix A Continued

OBS. 20: Nature of Injury – Mechanism of Death:
1=Single GSW  4=SFT  6=Other (list and describe)
2=Multiple GSW  5=Strangulation  7=Unknown
3=BFT

OBS. 21: Nature of other injury associated with attack:
1=Single GSW  4=SFT  7=Unknown
2=Multiple GSW  5=Strangulation
3=BFT  6=Other (list and describe)

OBS. 22: Weapon:
1= Handgun  5=Blunt (list specific)  9=Unknown
2= Shotgun  6=Ligature (list specific)
3= Rifle  7=Manual strangulation
4= Sharp (list specific)  8=Other (list)

OBS. 23: Location of Fatal Injuries (on body):
1= Head  4=Abdomen  7=Back
2= Neck  5=Upper Extremity  8=Combination (list)
3= Thorax  6=Lower Extremity  9=Other

OBS. 24: Location of other non-fatal injuries (list all that apply):
1= Head  4=Abdomen  7=Back
2= Neck  5=Upper Extremity  8=Combination (list)
3= Thorax  6=Lower Extremity  9=Other

Skeletal Fracture Patterns (refer to survival time protocol)

LOCATION OF CRIME SCENES:

OBS. 25: Was the body moved following the murder?  1=Yes  2=No  3=Unknown

OBS. 26: Provide complete street addresses for the following:
Victim’s Residence, Assailants Residence, 1st Encounter, 1st attack, 2nd attack, Murder Location, Body deposition – primary location, Secondary body deposition

BURIAL FACTORS

OBS. 27: Context of burial location:
1= Surface deposition
2= Sub-surface Burial
3= Dismemberment
4= Water (list type of body of water, i.e. river, bay)
5= Burning/fire or cremation

OBS. 28: Environment where body was recovered:
1= Public space  2= Private residence  3= Along roadside
4= Wooded area/field  5= Abandoned structure  6= Railroad tracks
7= Other (please list):
Appendix A Continued

**OBS. 29: Container:**
1 = blanket  2 = shower curtain  3 = carpet  4 = trash bin/dumpster  5 = other (list)

**OBS. 30:** Was there post-mortem modification to the body?
1 = Yes  2 = No  3 = Unknown
If so, describe

**OBS. 31:** Was there an attempt to alter the scene?
1 = Yes  2 = No  3 = Unknown
If so, describe

**OBS. 32:** Was there evidence to stage the crime scene?
1 = Yes  2 = No  3 = Unknown
If so, describe

**OBS. 33:** What was the position of the body?

**OBS. 34:** What was the direction the body was facing?

**OBS. 35:** What was found with the victim?
1 = Clothing  2 = Jewelry  3 = Weapon  4 = Identification papers  5 = Other (list)

**CIRCUMSTANCES OF DISCOVERY**

**OBS. 36:** Who found the body?
1 = spouse  2 = neighbor  3 = police  4 = stranger  5 = Other (list)

Time since death?

**List both time of discovery and time of death. Indicate if this time is known or estimated**

**OBS. 37:** Date/time of death:
**OBS. 38:** Date/time of discovery:

**OBS. 39:** State of preservation/decomposition?
1 = Fresh  8 = mutilated/dismembered
2 = Early Decomposition  9 = body fragment/part recovered only
3 = Advanced Decomposition  10 = Other (list)
4 = Mummified
5 = Skeletonized
6 = Burned
7 = Decomposing but in water
Appendix A Continued

**OBS. 40:** Was trace evidence found? 1=Yes 2=No 3=Unknown
If yes, what was found and at which of the locations?

**OBS. 41:** Was DNA evidence found? 1=Yes 2=No 3=Unknown
If yes, described was found/whose DNA?

**OBS. 42:** Was this case closed by arrest? 1=Yes 2=No 3=Unknown
If not, list other means of closing case (List):
Spatial Analysis of Crime Scene Locations in Cases of Criminal Homicide, 1997-2007
Data Form – Page 1 of 2

DATE AND RECORDER:
POLICE AGENCY:
POLICE REPORT NO.:
AUTOPSY NO.:
DATE OF INCIDENT:
DATE/YEAR OF POLICE REPORT:

Obs. 1:
Obs. 2:
Obs. 3:
Obs. 4:
Obs. 5:
Obs. 6:
Obs. 7:
Obs. 8:
Obs. 9:
Obs. 10:
Obs. 11:
Obs. 12:
Obs. 13:
Obs. 14:
Obs. 15:
Obs. 16:
Obs. 17:
Obs. 18:
Obs. 19:
Obs. 20:
Obs. 21:
Obs. 22:
Obs. 23:
Obs. 24:
Appendix A Continued

OBS. 25:
OBS. 26: SEE ATTACHED
OBS. 27:
OBS. 28:
OBS. 29:
OBS. 30:
OBS. 31:
OBS. 32:
OBS. 33:
OBS. 34:
OBS. 35:
OBS. 36:
OBS. 37:
OBS. 38:
OBS. 39:
OBS. 40:
OBS. 41:
OBS. 42:

COMMENTS:
Appendix A Continued

Spatial Analysis of Crime Scene Locations in Cases of Criminal Homicide, 1997-2007
Data Form Page - 2 of 2

DATE AND RECORDER:
POLICE AGENCY:
POLICE REPORT NO.:
AUTOPSY NO.:
DATE OF INCIDENT:
DATE/YEAR OF POLICE REPORT:

OBS. 26: Provide complete street addresses for the following:

Decedent’s Residence:

Assailant’s Residence:

1st Encounter:

1st attack:

2nd attack:

Murder Location:

Body deposition – primary location:

Secondary body deposition:

Comments: