

Predicting Neighborhood-Level Recidivism and Residential Status of Sexual Offenders
within the Context of Social Disorganization Theory

Dissertation

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Abstract

There is a paucity of research of macro-level risk factors for sexual offender recidivism. Further, criminal justice entities make concerted efforts to identify where sexual offenders reside in the community. In light of these observations, this research uses hypotheses derived from social disorganization theory to predict neighborhood-level recidivism and residential status of sexual offenders. Initially two types of recidivism, general and sexual were going to be measured, however sexual recidivism was dropped due to limited observations. Therefore observations for sexual recidivism were included in the general recidivism measure. Social disorganization theory postulates the neighborhood conditions that foster crime and delinquency. As such, this research analyzes data from 142 neighborhoods across an urban county in North Carolina to predict which areas have sexual offender recidivism, and which have sexual offender residents. The results indicate that neighborhoods with higher amounts of family poverty and ethnic heterogeneity are more likely to have general recidivism, while neighborhoods with higher amounts of individual and family poverty, owner-occupied dwellings, and ethnic heterogeneity are more likely to have sexual offender residents. Interestingly, the positive relationship between owner-occupied dwellings and residential status is counter to theoretical expectations. In terms of the three exogenous constructs of social disorganization theory: (1) ethnic heterogeneity supports the theoretical predictions, (2) concentrated disadvantage reveals mixed support, and (3) residential stability does not

support the theory. On a micro-level, 61.35% of the sexual offenders have general recidivism during the 100 months of tracking. The most prevalent type of recidivism is for failure to register, followed by drug and alcohol offenses, assaults, and sexual offenses. The risk of recidivism lasts for over eight years but does decrease as a function of time.

Dedication

Dedicated to the individuals, groups, and communities that are affected by sexual violence

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Chapter 1: Problem Statement

Sexual offenses have been documented in communities across the United States through official crime measures and academic research. In terms of magnitude and extent of the prevalence of sexual offenses, data from the 2004 Uniform Crime Report (UCR) showed that 94,635 forcible rapes were reported in the United States, while state and federal correctional facilities reported that there were at least 150,000 incarcerated sexual offenders (Harrison & Beck, 2006). The Center for Sex Offender Management (CSOM) estimated that one out of every six women has experienced either an attempted or completed rape (Tjaden & Thoennes, 1998). Further, Finkelhor (1994) found that one in five girls and one in seven boys had been sexually abused by age 18. These statistics only begin to suggest the prevalence of sexual offenses committed, however these offenses would increase exponentially if all non-detected episodes were included in reported statistics. Undoubtedly, most sexual offenses go unreported and therefore crime and recidivism measures were a crude underestimate of the social crisis. (Andrews & Bonta, 2003; Balmier, Heil & Bonita, 2000; CSOM, 2002).

Social scientists have invested a significant amount of time and resources into understanding sexual offenders by developing theories, (Keenan & Ward, 2000; Ward, Hudson, Marshall, 1995), creating assessment protocols, (Abel, Gore; Holland, Camp, Becker, & Rathner, 1989; Lanyon, 2001), implementing treatments (Hall, 1995; Pithers, 1990), and researching recidivism trends (Hanson & Bussiere, 1998). Many scholars and

practitioners in the profession of social work have made concerted efforts to understand and treat sexual offenders (Cowburn, 2000; Derezotes, 2000; Gentry, Dulmus, & Theriot, 2005; McCallum, 1997). In addition to the field of social work, Simon (2000) expressed that many professions including mental health, law, and criminal justice were concerned about the effects of sex offending on society.

Hanson and Bussiere (1998) used a meta-analytic study to support the theory that sexual offenders, once detected by the criminal justice system, continued to harm individuals, families, and communities through committing additional sex offenses. Their outcomes revealed that sexual offenders commit additional offenses, acts often referred to as recidivism. CSOM (2002) defined basic definitions for recidivism by subtyping three operational definitions of the construct as referring to:

- Subsequent Arrest*—Using new charges or arrests as the determining criteria for "recidivism" will result in a higher recidivism rate because many individuals are arrested but for a variety of reasons, but are not convicted.
- Subsequent Conviction* - Measuring new convictions is a more restrictive criterion than new arrests, resulting in a lower recidivism rate. Generally, more confidence is placed in reconviction, since this involves a process through which the individual has been found guilty. However, given the process involved in reporting, prosecution, and conviction in sex offense cases, a number of researchers favor the use of this more inclusive criterion.
- Subsequent Incarceration* - Some studies utilize a return to prison as the criterion for determining recidivism. There are two ways in which individuals may be returned to a correctional institution. One is through the commission of a new

offense and return to prison on a new sentence and the other is through a technical violation of parole. The former is by far the more restrictive criterion, since an offender has to have been found guilty and sentenced to prison. Technical violations typically involve violations of conditions of release, such as being alone with minor children or consuming alcohol. Thus, the use of this definition will result in the inclusion of individuals who may not have committed a subsequent criminal offense as recidivists. Therefore, it is imperative to determine if recidivism includes those with new convictions, technical violations, or both using a return to prison as the criterion for recidivism.

The literature on recidivism rates for sexual offenders has used all three of these methods for calculating recidivism, leaving researchers with multiple outcome measures for understanding the complexities and nuances of social issue (Greenburg, Bradford, Firestone, & Curry, 2000; Quinsey, Rice, & Harris, 1995; Serin, Mailloux, & Malcolm, 2001).

Micro Causes of Recidivism

As a dependent variable, recidivism has been one of the most salient measures used to illustrate the problem of sex offending (Firestone, et al. 1999; Hall, 1995; Hanson & Harris, 2000, 2001; Looman, Abracen, & Nicholaichuk, 2000; Proulx et al. 1997; Rice, Quinsey, & Harris, 1991; Seager, Jellicoe, & Dhaliwal, 2004; Turner, Bingham, & Andrasik, 2000). Sexual offender recidivism rates have fluctuated among studies from rates as low as 5% to 15% (Marques, 1999; Turner et al.) to rates that approximated 50% or higher (Looman et al.; Rice et al.). The variability in recidivism rates has been linked

to multiple factors including (1) types of offenders (Hanson & Bussiere, 1998), (2) static and dynamic risk factors (Andrews & Bonta, 2003; Hanson & Bussiere), (3) length of tracking period (Hanson, 2002), (4) how recidivism was made operational (Hanson & Bussiere), and (5) spatial behaviors (Beauregard, Proulx, & Rossmo, 2005).

Types of offenders were associated with recidivism as research established disparate recidivism rates between two types of sexual offenders: rapists and child molesters (Hanson & Bussiere, 1998). The results consistently revealed that rapists had higher rates of recidivism than child molesters (Hanson & Bussiere), or that their re-offenses were detected more frequently by the criminal justice system (Hanson, 2002). Researchers have differentiated child molesters into two subgroups: incest and extrafamilial (stranger or acquaintance sex offenders). Extrafamilial child molesters had higher rates of recidivism than incest offenders and rapists (Hanson).

In addition to the types of offenders, *static and dynamic risk factors* of known sexual offenders have been linked with recidivism. Static risk factors were the elements of sex offenders' biopsychosocial histories that remained constant, while dynamic risk factors were potentially changeable. Proulx et al. (1997) found that the static variables of age and offense history, and the dynamic variable of deviant sexual arousal were all related to recidivism. Similarly, Hanson and Bussiere (1998) also determined that the static risk factors of age and offense history, and the dynamic risk factors of marital status (single), pro-criminal attitudes, and deviant sexual arousal were all related to recidivism.

The *length of tracking* period, or the duration that sexual offenders were tracked for criminal offenses has also been associated with recidivism. Often referred to as the "opportunity to offend", research has revealed that the duration of a tracking period tends

to be positively associated with recidivism (Hanson, Steffy, & Gauthier, 1993; Looman et al. 2000; Serin, Mailloux, & Malcolm, 2001). According to Andrews and Bonta (2003), tracking recidivism for a group of sexual offenders was not a straight forward endeavor, but one rather convoluted by many factors. For instance, most sexual offenders were tracked for recidivism in non-institutional or community settings, and therefore individual differences existed in terms of when individuals were released into the community from prison, jail, treatment, or other institutions. Subsequently, some individuals had a greater chance of committing an act of recidivism because these individuals resided in the community for longer durations of time versus other individuals.

Likewise, variability in terms of when the opportunity to offend terminates for individuals within a group of sexual offenders is connected to recidivism. Some individuals return to jail, prison, or other institutions, others die, and/or move to new or different locations without notifying criminal justice entities. The multiple opportunities and combinations of events result in differences in when the opportunity to offend commences and terminates. Researchers, in an attempt to control for differences in tracking period durations among a group of sexual offenders, have used survival analysis statistics (Craig, Beech, & Browne, 2006; Dietrich, Smiley, & Frederick, 2007; Harris; Rice, Quinsey, Lalumiere, Boer, & Lang, 2003; Hildebrand, Ruiters, & Vogel, 2004; Langston, Barbaree, Harkins, Arenovich, McNamee, Peacock, Dalton, Hansen, Luong, & Marcon, 2008; Looman, Abracen, Serin, & Marquis, 2005). Survival analysis procedures control for the variability in tracking durations by accounting for the amount of time that an individual “survives,” or does not have an act of recidivism.

As noted earlier, measures of recidivism have been operationalized as arrests, convictions, and institutionalization of an individual (Hanson & Bussiere, 1998). These measures present a range of severity moving from arrest to institutionalization, each with an assumed scope and limit of circumstance. When the least severe of these measures, arrests, were used in studies, outcomes were found to be linked to the highest rates of recidivism versus those studies that used the more severe measures of arrests including convictions or additional institutionalizations (Andrews and Bonta, 2003; Furby, Weinrott, & Blackshaw, 1989; Hall, 1995; Hanson & Bussiere). This finding was partially accounted for by the assumptions that many sexual offenders plead down to lesser charges or had charges dropped (Andrews & Bonta).

Beauregard et al. (2005) examined multiple studies on the *spatial behaviors* of sexual offenders, measuring the physical distance between a sex offender's place of residence and location where the sexual offense occurred. Although they found variability in distances traveled ranging from 0 kilometers to 40 kilometers, the majority of sex offenses occurred in close proximity to the offenders' homes (within 3 kilometers). Further, they found that age (young), impulsivity, poverty, and race (non-white) were negatively associated with distances traveled to offend, while psychopathology was positively associated with distances traveled to offend. While the study did not specifically address or state purpose of examining recidivism, by proxy, the study did examine distances traveled for *first* recorded sex offenses. As previously noted, most sexual offenses are non-detected and therefore, it was probable, if not likely that these offenses were not the first for many of the participants (Ahlmeyer et al. 2000; Andrews & Bonta 2003; CSOM, 2002).

Macro Causes of Recidivism

Peterson, Krivo, & Harris (2000) found that neighborhood characteristics of economic deprivation, residential stability (amount of residential turnover), and ethnic heterogeneity were related to rape in a medium-sized metropolitan area, while Osgood and Chambers (2000), using data from rural communities, found that residential stability, family disruption (single-parent homes), and poverty were related to rape. Additionally, Mustaine, Tewksbury, and Stengel (2006) examined the concentrations of registered sexual offenders in neighborhoods across four medium-sized metropolitan regions in the United States, finding that socially disorganized neighborhoods had higher concentrations of sexual offender residents. All of these studies were framed by the social disorganization theory and presented a foundation for applying social disorganization theory to predicting where sex offenders reside and commit acts of recidivism.

Theoretical Framework

Clifford Shaw and Henry McKay, influenced by Robert Parks and Ernest Burgess, initially developed the social disorganization theory of crime and delinquency. Parks and Burgess (1925) theorized that the social conditions in urban settings changed dramatically as a function of a neighborhood's spatial proximity to downtown Chicago. They coined the term "concentric circles" as a measure for analyzing the geographic distance for any given neighborhood from downtown Chicago. What Parks and Burgess theorized was that social problems would be amplified in the areas just adjacent to downtown Chicago because these areas were often impoverished and had transient residents. Shaw and McKay (1942) subsequently used these observations to formulate

their theory on juvenile delinquency. Social disorganization theory was created when Shaw and McKay observed that juvenile delinquency was more prominent in these same areas noted by Parks and Burgess, the neighborhoods just adjacent to downtown Chicago. The main tenets for Shaw and McKay's theory were these disorganized neighborhoods were less able to safeguard themselves against delinquency and crime because the residents of these areas were unfamiliar with each other, were not invested in the well being of their neighborhoods, or simply lacked tangible and intangible resources to address delinquency.

Shaw and McKay (1942) empirically supported their theoretical assumptions by linking delinquency rates to three exogenous constructs: concentrated disadvantage, residential stability, and ethnic heterogeneity. Concentrated disadvantage reflected poverty in a neighborhood, residential stability related to residential turnover, while ethnic heterogeneity referred to the ethnic variability among the families and individuals who resided within the same neighborhood. Shaw and McKay found that delinquency was more likely to occur in neighborhoods (those impoverished, had many transient residents, and were ethnically diverse) that were disorganized and unable to inhibit crime due to deficient resources, social barriers between ethnicities (language, values, customs, etc.), and unfamiliarity among residents. Subsequent testing of social disorganization theory has used these three constructs, as well as multiple mediating and moderating social influences, to explain crime (Bellair, 1997; Kasarda & Janowitz, 1974; Kornhauser, 1978; Morenoff, Sampson & Raudenbush, 2001; Sampson, 1997; Sampson & Groves, 1989; Sampson, Morenoff, & Earls, 1999; Veysey & Messner, 1999) and sexual offenses (Osgood & Chambers, 2000; Peterson et al. 2000).

This present research will use social disorganization theory to predict neighborhood-level residential status and recidivism among sexual offenders. The possibility that sexual offender residents will reside in socially disorganized neighborhoods is plausible. Many sexual offenders were harassed in the community when other individuals were notified of their presence (Edwards & Hensley, 2001) and as a result, offenders may seek areas to reside in where organization is low, and subsequently the label of sexual offender can remain more anonymous (Mustaine et al. 2006). Additionally, opportunities for employment and social integration can be extremely limited for sexual offenders due to the actual or perceived risk and by default, offenders are more inclined to reside in disorganized neighborhoods (Levenson & Cotter, 2005; Winick, 1998). Mustaine et al. found the social disorganization theory to be an invaluable framework to describe neighborhood concentrations of sexual offender residents. This research builds on these findings by using social disorganization theory to: (1) predict neighborhood-level characteristics associated with residential status, and (2) predict neighborhood-level characteristics associated with general and sexual recidivism.

In lieu of Shaw and McKay's neighborhood observations, census tracts will approximate neighborhoods in this study. The following dependent variables will be: (1) residential status; (2) general recidivism; and (3) sexual recidivism. The three explanatory constructs are: (1) the degree of concentrated disadvantage; (2) the amount of residential stability; (3) and the amount of ethnic heterogeneity; and the six independent variables drawn from these constructs are individual and family poverty, unemployment (concentrated disadvantage), owner-occupied dwellings, residential consistency

(residential stability), and ethnic heterogeneity. Additionally, four micro-level research questions will determine the *percentages* of sexual offenders that have acts of general and sexual recidivism, with an additional emphasis on the *likelihood* (survival analysis) for general and sexual recidivism. With these variables in mind and with the guidance of social disorganization theory, this proposed study will answer the following research questions and test the following hypotheses:

Research Questions

1. What percentages of sexual offenders commit acts of general recidivism?
2. What percentages of sexual offenders commit acts of sexual recidivism?
3. What is the likelihood of sexual offenders committing acts of general recidivism?
4. What is the likelihood of sexual offenders committing acts of sexual recidivism?

Hypotheses

1. The degree of concentrated disadvantage will be positively related to residential status.
2. The amount of residential stability will be negatively related to residential status.
3. The amount of ethnic heterogeneity will be positively related to residential status.
4. Residential status will be predicted from a combination of the degree of concentrated disadvantage, amount of residential stability, and the amount of ethnic heterogeneity.
5. General recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity.
6. Sexual recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity.

Chapter 2: Literature Review

This literature review will be derived from the social and behavioral sciences, and legal research. This literature review will (1) outline historical sexual offender penology's; (2) depict contemporary sexual offender penology's; (3) illustrate how social disorganization theory has emerged over the past seven decades; (4) summarize how social disorganization theory explains crime and delinquency; and (5) provide an overview of sex offender recidivism studies.

Historical Sexual Offender Penology's

The history of offender penology in the United States has been dichotomized between the extremes of punishment and treatment (Cole, 2000; Logan, 1999; Winick, 1998). Blomberg and Lucken (2000) highlighted these paradigms as fluctuating between liberal notions of rehabilitation and the conservative assumptions of being punitive. Influences that have dictated these paradigms were identified as the media, politicians, and a variety of special interest groups (Blomberg & Lucken; Cole). In terms of sexual offender specific penology, three distinctive penology eras manifested during the last 75 years including (1) sexual psychopathology statutes of the 1930s to 1950s, (2) rehabilitative efforts during the 1960s & 1970s, and (3) the current risk management era (Cole).

Sexual psychopathology statutes prevailed from approximately 1937 through the 1950s and these strategies represented a punitive paradigm for managing sexual

offenders. Cole (2000) described how this era was initiated in 1937 in response to sex crimes that occurred during the 1930s. What ensued was sensationalized coverage of cases of sexual violence, and eventually public disdain with the perception that sexual predators preyed upon vulnerable individuals. In response, sexual psychopathology statutes sought to treat sexual offending as a psychiatric illness, a disorder which could be treated or managed in state mental hospitals. By 1949 thirteen states had sexual psychopathology statutes which emphasized intensive hospitalization and indeterminate sentencing (Cole). Whether this era can be interpreted as being predominately punitive, or a subtle mix of being punitive and rehabilitative, can be debated. Overall, the era of psychopathology statutes was greatly by societal fears regarding the management of sexual offenders (Cole).

Simon (2000) wrote about the *rehabilitative efforts* prevalent during the progressive movements of the 1960s and 1970s that emphasized rehabilitation, encouraging offenders to gain insight into childhood issues while learning to manage one's own victimization. The assumptions were that rehabilitative efforts would reduce recidivism through psychological healing. However these treatments diminished during the 1970s and 1980s as research suggested that sexual offender treatment was not effective, that it did not reduce recidivism (Furby et al. 1989). Subsequently, and after several decades of rehabilitative efforts, another transition in the penology of sexual offenders developed, reverting back to punitive efforts.

Blomberg and Lucken (2000) described this transition facilitated by the political "left" and "right." In terms of the liberal perspectives, there were concerns about the state-sanctioned practices that were occurring in institutions, whether they pertained to

deplorable institutional conditions which became salient via several horrific prison riots, particularly at Attica, or whether they manifested from general distrust of governmental institutions. The political right claimed that the rehabilitative efforts did not reduce recidivism, deter, or incapacitate sexual offenders. Martinson's (1974) research on offender rehabilitation reflected the politically "right" assumption that "nothing works." Although the study was often misrepresented as supporting that rehabilitation of criminal offenders was fruitless, it did shed insight into the inadequacies of prison treatment. The Furby et al. (1989) meta-analysis on treatment outcomes for sexual offenders coincided with the aforementioned work by Martinson, finding that treatment had no effects on sexual offender recidivism, that it actually increased the chance of offending. As a whole, critics from both the political "left" and "right" helped shape the political landscape for promoting a more punitive penology for sex offenders, a paradigm that emphasized risk management.

Contemporary Sex Offender Penology

The current paradigm of *risk management* emerged during the 1990s and early twenty-first century and emphasized community protection and risk management. During this time, legislation mandated registration and community notification for convicted sexual offenders residing in the community (Birgden, 2004; Edwards & Hensley, 2001; Elbogen, Patry & Scalora, 2003; Levenson & Cotter, 2005; Logan, 1999; Koenig, 1998; Petrunik, 2003; Richardson, 2002; Scholle, 2000; Winick, 1998). While risk management began in the late 1980s, the paradigm truly took shape with the 1990 Washington State Community Protection Act, the 1994 Jacob Wetterling Act, and the 1996 Megan's Law. These legislations required sexual offenders living in the

community to register their names and addresses with criminal justice entities, further requiring these entities to notify the public about the presence of any sexual offender if they (1) resided within the community and (2) were deemed by criminal justice officials to be at moderate or high-risk for recidivism.

However, there have been major critiques of the risk management era, with perhaps the most significant issues being the ineffectiveness in protecting community residents (Petrosino & Petrosino, 1999). Edwards and Hensley (2001), in their conceptual work, inferred these mandates could increase the likelihood of crimes committed by sexual offenders due to enhanced psychosocial stressors. Similar to the sexual psychopathology of the 1940s, the literature implied that the risk management era was enacted via public outcry due to sensationalized media coverage of several cases of brutality, and not through critical thought or empirical evidence. Thus history repeated itself as the former era of sexual psychopathology statutes and this contemporary era of risk management were dramatically influenced by the media, special interest groups, politicians, and political gains (Blomberg & Lucken, 2000; Cole, 2000).

The initial landmark legislation for the risk management era was the 1990 Washington State Community Protection Act that (1) mandated indefinite psychiatric commitments for individuals deemed to be sexually violent predators and (2) implementation of state sexual offender registration and community notification protocols (Milloy, 2003). Similar to other legislation ratified during the risk management era, this law was enacted in response to the horrific rape and murder of a seven year-old boy by a known sexual offender. While this legislation was considered to be groundbreaking, it was the next act, the Jacob Wetterling Act, which affected sexual offender

legislation more broadly. The act, named after a boy living in Minnesota that was assumed to have been kidnapped by a sexual offender, became federal legislation. As a condition under the act, sexual offender registration was mandated, and the legislation was enforced by the federal government withholding 10% of a state's crime fighting funds for non-compliance (Koenig, 1998). What resulted was that convicted sexual offenders were required to give law enforcement several pieces of personal information including their home addresses, fingerprints, physical characteristics, descriptions of their past sex offenses, and potentially other pieces of pertinent information (Koenig).

Nonetheless, the Jacob Wetterling Act was found to be insufficient at protecting society's vulnerable citizens and the brutal rape and murder of a seven-year-old girl, Megan Kanka, in New Jersey brought these issues to the forefront of public scrutiny (Koenig, 1998). Megan was victimized by a 32 year-old neighbor, an individual with a history of committing sex crimes. With intense public outrage, sensationalized media coverage, and ample political support, Megan's Laws, an amendment to the Jacob Wetterling Act, was passed. This act, another piece of federal legislation, mandated community notification protocols for sexual offenders. Megan's Laws mandated public disclosure for sexual offenders who were residing in the community and were deemed to be at a medium, or high-risk to offend. In 1996 the law became ratified on a federal level, and shortly there after it became uniformly enforced in all 50 states and the District of Columbia (Petrunik, 2002).

At the state level these sexual offender legislations were not uniformly applied, as the federal guidelines set the "floor" or minimum standards of adherence; it was at the state level that the true implementation occurred (Logan, 1999). Winick (1998)

illustrated that many states base community notification requirements on a three-tier system, placing sexual offenders in one of three categories (low, medium, and high) based on the presumed risk of offending. Logan described the typical community notification protocols for the three tiers as (1) law enforcement entities were solely notified about the presence of low risk offenders, while (2) particular systems, agencies, or institutions who served at-risk populations such as schools and daycares were notified about the presence of medium risk offenders, and (3) everyone in a community were notified about the presence of high risk offenders.

Matson and Lieb (1997) compared implementation of community notification protocols among the states and found that some jurisdictions notified everyone within a 1,000 foot radius of the sex offenders' places of residence, while other states extended this parameter to a 5,000 foot radius. They also discovered diversity among notification strategies, including letters sent from law enforcement entities, use of 900 numbers, use of the internet to disseminate information, and even requiring the offender to go door-to-door to notify community members in-person. Additionally, sexual offender legislations were strengthened by two additional federal mandates: the 1996 Pam Lyncher Act, ratified to promote the lifelong tracking of serious repeat offenders and the 1998 Commerce, Justice and State, the Judiciary, and Related Agencies Appropriating Act, designed to enforce the identification of sexually violent predators (Petrunik, 2002).

Sexual offender legislations were ratified expeditiously across the United States during the 1990s without much political or social opposition (Petrunik, 2003). Yet there were legal challenges to the constitutionality of the laws in terms of the 8th amendment (cruel and unusual punishment) and the 14th amendment (due process) infringements

(Koenig, 1998). These challenges were consistently not substantiated by local, state, or federal courts. Although some ex post facto claims were made stating sexual offenders were punished twice for the same crime, particularly for sexual offenders who were convicted before the enactment of sexual offender legislations (Koenig), most courts ruled that the laws did not reflect cruel and unusual punishment (8th amendment), nor infringements on due process (14th amendment). The rulings supported state and federal incentives to protect the collective whole superseded the rights of the individual (Cole, 2000; Koenig; Logan, 1999; Winick, 1998). A landmark case that represents the courts relegating the liberty interests of the individual as secondary to community protection was the 1997 case of *Hendricks vs. Kansas*. In this case the courts supported the necessity of civilly committing a sexually violent predator to an indeterminate psychiatric unit (Koenig).

Winick (1998) claimed that sexual offender legislations were based on the ideals of (1) protecting vulnerable citizens and (2) providing criminal justice entities with an accurate data base for investigating, detecting, and monitoring the movements of sex offenders. Despite these idealistic goals, what were documented were the shortcomings of these laws at effectively managing sexual offenders. Some issues were public harassment of registered sexual offenders, deficient implementation due to inadequate resources, compliance or tracking issues, unconstitutionality of the laws, increased likelihood of not reporting sexual offenses, or even the possibility of facilitating recidivism (Edwards & Hensley, 2001; Elbogen, Patry, & Scalora, 2003; Levenson & Cotter, 2005; Petrunik, 2002; Winick; Zevitz & Farkas, 2000).

There have been efforts to empirically determine the efficacy of sexual offender

legislations. Schram and Milloy (1995) conducted a comprehensive study on Washington State's community notification law for level III sexual offenders-individuals who were deemed to be at a high risk to offend. The study compared a group of high-risk sex offenders who offended before the enactment of the law with a sample of high-risk sex offenders who offended after the law was enacted. After 54 months the results indicated a non-significant finding that 57% of the after enactment group compared to 47% of the before enactment group had an offense. Another non-significant finding was that 19% of the after enactment group compared to 22% of the before enactment group had a sexual offense. However, the after enactment group was more likely to be arrested sooner than the before enactment group. Petrosino and Petrosino (1999) also studied a sample of high-risk sexual offenders to determine the efficacy of the Massachusetts State sexual offender legislations. Their findings were that the laws did not protect victims of sex crimes because individuals had no opportunities to be notified about the presence of sexual offenders.

Research on sexual offender legislations has quantified additional issues, deficiencies, and obstacles with the laws. For instance, research has found that sexual offenders do not completely understand the legislations protocols, personal responsibilities, or tasks required to be in compliance with the mandates (Elbogen et al. 2003). Further, professionals responsible for supervising these individuals had problems with enforcement due to large caseload and deficient resources (Zevitz & Farkas, 2000). Several studies have determined that community notification caused fear, particularly for females, married couple, families with children, and people with less education (Caputo & Brodsky, 2003; Beck & Travis, 20004).

In general the literature implied that sexual offender legislations had some positive implications, but there were many negative outcomes. Many critics of sexual offender legislations have used the legal model of therapeutic jurisprudence as a framework for basing their assumptions. Winick (1998) described the Therapeutic Jurisprudence model as a legal philosophy that emphasizes the therapeutic consequences of the law. He postulated that sexual offender legislations have anti-therapeutic and therapeutic affects for sexual offenders and the community, but that legal and criminal justice professionals must be particularly cognizant of the anti-therapeutic effects of labeling and negating treatment outcomes. Likewise, Edwards and Hensley (2001) also believed that the therapeutic jurisprudence model framed the issues of increasing triggers for relapse, harassment of family members, encouraging non-reporting of sexual offenses, reducing the desire for treatment, and the tendency for sexual offenders to move into other areas to find victims (e.g. more stranger offenses). Birgden (2004) further supported the therapeutic jurisprudence model as being a framework for aligning criminal justice entities into an effective psycholegal system for handling sexual offenders.

As previously noted, sexual offender legislations were federally ratified for the purposes of knowing (1) where sexual offenders reside, and (2) reducing the risk of offending (Edwards & Hensley, 1998; Winick, 1998). The emphasis on the latter point was logical, particularly when considering the observations that sexual offenders commit recidivism, both sexual and non-sexual, and that the risk of recidivism can last for many years (Furby, Weinrott & Blackshaw, 1989; Hanson, 2002; Hanson & Bussiere, 1998). In 2006 the North Carolina general assembly modified the states comprehensive sexual offender legislations. Below is a list of

these amendments:

- General Statute 14-208.6-sexually violent offenses which constitute community registration requirements include first and second degree rape, sexual battery, attempted rape or sexual offense, intercourse and sexual offenses with certain victims, incest between near relatives, employing or permitting minor to assist in offense against public morality and decency, felonious indecent exposure, first and second and third degree exploitation of a minor, promoting prostitution of a minor, participating in the prostitution of a minor, taking indecent liberties with a child, and solicitation of child by computer to commit an unlawful sex act.
- General Statute 14-208.6A-lifetime registration requirements for criminal offenders who were sexually violent toward minors, and recidivists who commit aggravated offenses or were determined to be a sexually violent predator.
- General Statute 14-208.7-all sex offenders who are state residents must register with the sheriff for the county where the person resides. If moving from another state or being released from a penal institution the individual must register within ten days of the relocations. All sex offenders must maintain registration protocols for at least ten years.
- General Statute 14-208.9-if the registered sex offender changes addresses a written notification must be made within ten days to the sheriff's office of the new jurisdiction.
- General Statute 14-208.9A-sex offenders must update their addresses six months after their registration date, and then annually for the duration of the registration term.

- General Statute 14-208.11-sex offenders who fail to register, falsify their verification notices, and fail to return verification forms will be arrested and convictions will result in a Class F felony.
- General Statute 14-208.16-all sex offenders cannot knowingly reside within 1,000 feet of any public or private schools or daycare centers.

Emergence of Social Disorganization Theory

Shaw and McKay (1942), similar to other criminologists from the University of Chicago (Burgess & Parks, 1925) during the early to mid-twentieth century, were interested in determining ecological correlates of social phenomena (e.g. delinquency, poverty, immigration, etc.). After analyzing delinquency rates from the city of Chicago for over a 70 year time-span (e.g. mid-nineteenth to mid-twentieth centuries) Shaw and McKay began to postulate ecological factors that facilitated delinquency. These high delinquency areas, which Shaw and McKay conceptualized from Burgess and Park's notions of concentric circles (e.g. each circle represented a neighborhoods distance or proximity from downtown Chicago), were consistently located just adjacent to the center city of Chicago. Shaw and McKay observed that these areas in Chicago tended to attract immigrants, whether the populations were from Ireland, Poland, Germany, Italy, or blacks relocating from the South. What was noted was that these neighborhoods tended to be impoverished and therefore affordable for many immigrants with minimal resources. Shaw and Mackay also observed the transient nature of these areas, speculating that immigrants remained in these neighborhoods until enough resources could be accumulated to re-locate. Shaw and McKay (1942) based the social disorganization theory of delinquency on the three following ecological dynamics, (1)

community members could not organize due to inferior resources (concentrated disadvantage), (2) poor community cohesion resulted from the transient nature of the neighborhoods' residents (residential stability) and, (3) there were barriers among community members as a result of ethnic differences (ethnic heterogeneity).

Decades later, social disorganization theory received more attention as researchers added depth to the social processes that mediated crime and delinquency in neighborhoods. Kornhauser (1978) postulated that socially disorganized neighborhoods lacked both the formal and informal mechanisms to socially control their residents. Kornhauser believed that community values could not be expressed due to deficiencies in community cohesion and what resulted was a culture of crime and delinquency. Kasarda and Janowitz (1974) addressed the importance of systemic influences in a community and how relationships among systems dictated the well being of the community, whether positively or negatively. Together these scholars generated a renewed vigor for the utility of social disorganization theory by describing the macro-level factors that mediate crime and delinquency. In response, research revealed that these social processes did mediate crime and delinquency from modes of informal social control (Bellair, 1997; Rountree & Warner, 1999; Sampson & Groves, 1989), to community cohesion (Lee, 2000), and collective efficacy (Morenoff et al. 2001; Sampson, 1987; Sampson et al. 1997).

Social disorganization theory has been tested with official criminal measures and victimization surveys (Sampson et al. 1997). Research has triangulated both data sources to produce robust crime and delinquency outcomes (Morenoff et al. 1999; Morenoff et al. 2001; Sampson & Groves, 1989; Sampson et al. 1997; Veysey &

Messner, 1999). The shortcomings of both types of data have been documented in the literature. Official crime reports may be biased towards particular crimes and/or criminals being detected (Andrews & Bonta, 2003), while victimization surveys may be subject to measurement error as respondents use their own discretion to identify crime and delinquency (Andrews & Bonta, Sampson & Groves, 1989).

Independent variables that approximated ecological influences on crime and delinquency have consistently been operationalized through census survey data (Bellair, 1997; Osgood & Chambers, 2000; Morenoff et al. 1999; Morenoff et al. 2001; Peterson et al., 2000; Rose, 2000; Rountree & Warner, 1999; Sampson et al. 1997). *Concentrated disadvantage* has been operationalized through multiple measures including individual or family poverty, unemployment, median family income, single or female-headed households, social class, education, and occupational status (Sampson & Groves, 1989; Veysey & Messner, 1999). *Residential stability* has been operationalized as residents living in the same dwelling for at least five years, vacant dwellings, and owner-occupied dwellings (Sampson & Groves, 1989; Veysey & Messner). *Ethnic heterogeneity* typically measured the racial compositions of neighborhoods (Sampson & Groves, 1989; Veysey & Messner).

In social disorganization research independent and dependent variables have been aggregated to various levels of measurement. Some researchers have used smaller units of analysis whose mean populations have ranged from 3, 000 to 8, 000 residents (Ouimet, 2000; Sampson & Groves, 1989; Sampson et al. 1997), and others used larger units of analysis whose mean populations were over 20,000 residents

(Bellair, 1997; Ouimet; Schulenburg, 2003). The smaller units of analysis were often operationalized as census tracts, officially recognized neighborhoods, or neighborhood clusters, while the larger units of analysis were either larger neighborhoods or standardized metropolitan areas. Ouimet compared the smaller units of analysis ($x = 3,531$) with larger units of analysis ($x = 20,808$) finding that the larger units of analysis explained more variance in juvenile delinquency than the smaller units of analysis. However, Wooldredge (2002) found that the smaller unit of analysis explained more variance in domestic violence than the larger units of analysis.

Initially conceived as a framework for explaining delinquency, and later crime, social disorganization theory has been used for understanding a wide variety of social phenomena including behavioral problems in school (Welsh, Stokes & Greene, 2000), parenting and depression among African-American and Latino families (Roche, Ensminger, & Cherlin, 2007), premarital childbearing (Pitso & Carmichael, 2003), racial profiling (Parker, MacDonald, Alpert, Smith & Piquero, 2004), and cultural attenuation (Warner, 2002). Interestingly, social disorganization research has been linked to other criminal justice outcomes besides crime and delinquency. For instance, Mustaine et al. (2006) found the framework could describe the concentrations of sex offender residents in neighborhoods across medium-sized metropolitan areas. Other researchers have found that social disorganization theory had utility for explaining prison privatization (Hallet, 2002), and the choices between directly intervening and calling authorities during crime disturbances (Warner, 2007).

Testing Social Disorganization Theory

Fifty-eight years after Shaw and McKay's initial findings, research supported social disorganization theory for explaining delinquency. Ouimet (2000) found that ethnic heterogeneity and single-parent families were positively associated with juvenile delinquency for violent and non-violent offenses. Osgood and Chambers (2000) also established support for linking concentrated disadvantage, residential stability, and ethnic heterogeneity to delinquency. What was novel about Osgood and Chamber's research was that it tested the theory in rural settings, adding breadth to the theory.

In terms of being a theory of crime, research over the past two decades has supported social disorganization theory (Bellair, 1997; Morenoff, et al. 2001; Peterson et al. 2000; Sampson & Groves, 1989; Sampson et al. 1997; Veysey & Messner, 1999; Shulenberg, 2003; Wooldredge, 2002). Sampson and Groves (1989) were the first to comprehensively test the theories exogenous and mediating influences on crime. Their findings, from both official crime measures and victimization surveys, indicated that social disorganization theory explained many types of crime including muggings, robberies, burglaries, auto thefts, and vandalism. Further, the results revealed that several mediating factors, particularly unsupervised peer groups mediated the effects of the independent variables on crime. Veysey and Messner, using the same data sets but more sophisticated statistics discerned that concentrated disadvantage indirectly predicted crime, but that the mediating influences of unsupervised peers, urbanization and family disruption had the greatest direct effects on crime.

Overall, social disorganization theory has received consistent support for explaining crime and delinquency (Morenoff et al. 2001). Schulenburg (2003) conducted a crucial test among three ecological (based on urban landscapes or social environmental characteristics) frameworks of crime to compare the utilities of social disorganization, routine activities, and urbanization theories for explaining arrests. The results indicated no support for the urbanization theory, minimal support for routine activities, and substantially more support for social disorganization theory. In addition, the integration of urbanization and social disorganization theories did explain the mediating influences of formal social control.

Social disorganization theory has consistently explained crime and delinquency from domestic and international data (Lee, 2000; Veysey & Messner, 1999). But did the theory hold promise for understanding sexual offenders and sexual offenses? Researchers have found that the theory explained rape in urban (Peterson et al. 2000) and rural (Osgood and Chamber, 2000) settings, and also described neighborhood concentrations of sex offender registrants (Mustaine et al. 2006). However, the utility of the theory at explaining recidivism for sexual offenders has not been tested.

Sexual Offender Recidivism

Research on sexual offender recidivism found risk factors associated with offending for known sexual offenders (Hanson & Bussiere, 1998). What these studies established was that recidivism was associated with age, marital status, frequency of previous convictions, gender of victim, psychopathology, mental health disorders, deviant sexual arousal, treatment compliance and completion, plus substance abuse

(Firestone et al. 1999; Hanson, 2002; Hanson & Bussiere; Hanson & Harris, 2000; Hanson et al. 1993; Marques, 1994; Marques, 1999; Proulx et al. 1997; Quinsey et al. 1995). Recidivism researchers also consider the risk sexual offenders had for committing offenses when interpreting outcomes. For instance, Vogel et al. (2004) found that 74% of high-risk, mentally disordered sexual offenders had recidivism as measured by convictions. Quinsey et al. (1998) calculated a 40% recidivism rate for sexual offenders from a maximum security psychiatric facility. Combined, these rates of recidivism observed by both Vogel et al. and Quinsey et al. coincided with outcomes from other institutionalized, high-risk samples that had recidivism rates exceeding 40% (Hanson et al. 1993; Rice et al. 1991; Serin et al. 2001).

Additional issues researchers had to acknowledge were duration of tracking periods, sample attrition, and overall measurement concerns. As for duration of tracking periods, attention has been given to the duration of time that sexual offenders were followed for recidivism (Hanson & Bussiere, 1998). Most recidivism tracking began when sexual offenders were released into the community (i.e. released from prison, psychiatric hospital, etc.) and continued until recidivism data was no longer collected, individuals were institutionalized, or individuals died (Firestone et al. 1999; Hanson et al. 1993; Seager et al. 2004; Serin et al. 2001). Researchers controlled for unequal tracking periods among individuals in a sample by using event history analysis (Craig et al. 2006; Dietrich et al. 2007; Harris et al. 2003; Hildebrand et al. 2004; Langston et al. 2008; Looman et al. 2005). Event history analysis calculated the amount of time that a sexual offender “survives,” or does not have recidivism while residing in the community.

Sample attrition was another issue that affects sexual offender recidivism

research. For instance, Rice et al. (1991) could not track recidivism for 14% of child molesters due to individuals being uncooperative, psychotic, and data being lost. Serin et al. (2001) could not calculate recidivism for 16% of rapists and child molesters due to incorrect data and individuals being institutionalized. Seagar et al. (2004) could not track recidivism for 18% of sexual offenders from a medium security prison because of individuals being incarcerated. Finally, recidivism was always affected by measurement concerns and issues with data (Hanson & Bussiere, 1998). More specifically, recidivism was often an official, yet crude measure of offenses that were detected by the criminal justice system. As such, occurrences of non-detected recidivism convoluted “true” rates of recidivism (Andrews & Bonta, 2003). What has also been noted was that crime measures, such as UCR data, may be biased toward certain social groups being overly represented in the data (Andrews & Bonta).

Over the past several decades researchers have attempted to address the aforementioned research issues using meta-analysis methodologies to aggregate multiple sexual offender recidivism studies to demonstrate overall trends of recidivism (Hanson & Bussiere, 1998). While meta-analysis enabled researchers to discern more robust findings by aggregating the results from multiple studies, one limitation of this methodology was that dissimilar outcome measures, tracking periods, and samples tended to be lumped together into one analysis, making interpretation of outcome measures generalized and not specific to any one study (Furby, Weinrott, & Blackshaw, 1989; Hall, 1995; Hanson & Bussiere). Despite this limitation, use of meta-analysis methodologies revealed strong outcomes regarding trends of sexual offender recidivism. Hanson and Bussiere conducted a landmark meta-analysis study of sexual offender recidivism by

combining data from sixty-one studies for the purposes of predicting sexual, non-sexual violent, and general recidivism among sexual offenders. Results from the final sample of 28, 972 individuals revealed that 13.4% had sexual recidivism. Concerning subpopulations examined in the research, rapists had 18.9% sexual recidivism and child molesters had 12.7% sexual recidivism.

Several meta-analysis studies investigated the impact of sexual offender specific treatment on recidivism. Furby et al. (1989) conducted a meta-analysis of forty-two studies that compared recidivism rates between groups, one that received treatment and one that received no treatment. Outcomes revealed that individuals that did not receive treatment had recidivism rates lower than 12%, while those who received treatment had recidivism rates higher than 12%. Furby et al. concluded that treatment had no effects on reducing recidivism and that treatment actually appeared to increase the likelihood of recidivism. Hall (1995) also conducted research on the effects of treatment on sexual offender recidivism, analyzing outcomes between sexual offenders who received treatment and sexual offenders who received no treatment. Of the sample of 1,313 sexual offenders, 19% of those that received treatment and 27% of those that did not receive treatment had an act of recidivism, indicating a small treatment effect. The contrasting findings between these two studies may be attributed to the fact that Furby et al. compared predominately behavioral treatment, while Hall compared cognitive-behavioral treatment. Cognitive-behavioral protocols have been found to be more effective than behavioral interventions in reducing recidivism for all offenders, sexual and non-sexual (Andrews & Bonta, 2003).

Meta-analysis methodologies produced quantifiable trends for sexual offender

recidivism: (1) recidivism rates varied approximately between 10 % and 30%, (2) rapists either offend or were detected more frequently than child molesters, (3) treatment had small effects on reducing recidivism, and (4) sexual offenders not only committed acts of sexual recidivism, but also committed non-sexual offenses. Hanson and Bussiere (1998) found that sexual offenders had higher rates of non-sexual recidivism than sexual recidivism, reporting that 36.9% of child molesters and 46.2% of rapists offended by means of a non-sexual offense (compared with the previously mentioned sexual recidivism rates of 12.7% for child molesters and 18.9% for rapists). Again rapists had more acts of recidivism than child molesters (Hanson and Bussiere, 1998). Overall a significant portion of sexual offender recidivism research calculated rates for non-sexual and sexual recidivism and uniformly all of these studies indicated that sexual offenders participated in many criminal activities, not just sexual offending (Firestone et al. 1999; Looman et al. 2000; Proulx et al. 1997; Rice et al. 1991; Serin et al. 2001; Seager et al. 2004; Vogel et al. 2004).

Thus an interesting debate has emerged in the criminology literature, whether or not a sexual offender can be differentiated from a non-sexual offender in terms of psychosocial characteristics and treatment efficacy (Andrews & Bonta, 2003). While sexual offenders displayed one factor that seemed to be unique to the acts of sex offending, namely deviant sexual interests (Hanson & Bussiere, 1998), sexual offenders also manifested factors found in those who commit non-sexual offenses such as psychopathology, procriminal attitudes, deficiencies in self control, history of previous criminal offenses (high), age (younger), marital status (unmarried), and empathy deficits (Andrews & Bonta; Craissati & Beech, 2003; Hanson & Bussiere).

Emerging from the literature was the assumptions that sexual and non-sexual offenders were divergent in some areas, but that both groups of offenders shared many of the same characteristics. Thus researchers could argue that a general theory crime such as social disorganization theory would have utility for explaining recidivism among sexual offenders.

Chapter 3: Methodology

Research Design

The research design is the investigator's plan for how the study is conducted, how the sample is gathered, how the variables are measured, and the validity and reliability of these measurements. Overall, this plan guides this researcher for answering the research questions and testing hypotheses. Given these parameters this methodology dictates that multiple types of information are gathered including sexual offenders' residences, when and where acts recidivism occur, the durations of time between when sexual offenders register with the authorities and when arrests occur, and demographic characteristics of census tracts. Data sources are the 2000 U. S. Census Bureau, Mecklenburg County Sheriff's Office, Mecklenburg County Clerk of Courts, Charlotte Police Department, plus public information provided via the internet from the State Department of Corrections (North Carolina, South Carolina, Virginia, etc.), and state sexual offender registries (North Carolina, South Carolina, Virginia, etc.).

Another critical issue in this study involves using census tracts to represent neighborhoods. Researchers have used disparate geographic areas to approximate neighborhoods including neighborhood clusters (Morenoff et al. 2001), standard metropolitan statistical areas (Bellair, 1997), and block groups (McNulty & Holloway, 2000). However census tracts approximate neighborhoods in this research because this estimation consistently reflects viable neighborhood influences in criminology research (Mustaine et al. 2006; Ouimet, 2000; Peterson et al. 2000; Rountree & Warner, 1999;

Wooldredge, 2002; Wikstrom & Loeber, 2000). In this research, one census tract does not have any residents because this area has only industrial complexes (e.g. part of downtown Charlotte). Thus this tract is deleted from the analysis because there are no demographic correlates.

In Chapter 1, the research questions and the theoretical variables were described. The research questions were: (1) what percentages of sexual offenders commit acts of general recidivism; (2) what percentages of sexual offenders commit acts of sexual recidivism; (3) what is the likelihood that sexual offenders will commit acts of general recidivism; and (4) what is the likelihood that sexual offenders will commit acts of sexual recidivism. While the dependent variables were: (1) residential status; (2) general recidivism; and (3) sexual recidivism. The independent variables were: (1) Individual Poverty; (2) family poverty; (3) unemployment; (4) owner-occupied dwellings; (5) residential consistency; and (6) ethnic heterogeneity. Theoretically, these six independent variables would approximate the three exogenous constructs of social disorganization theory. These constructs were: (1) Concentrated disadvantage (individual and family poverty, and unemployment); (2) residential stability (residential consistency, and owner-occupied dwellings); (3) and ethnic heterogeneity.

However, several modifications are occurring to the research methodology to accommodate data issues. More specifically, the original four research questions are being reduced to two (e.g. questions two and four dropped) questions; and the original six hypotheses are being reduced to five (e.g. hypothesis six dropped) hypotheses. The reason for the deletion of the research questions and hypothesis is the scarcity of observations for sexual recidivism (see pp. 40 of this document). As a result, the two

research questions in this research are: (1) what percentages of sexual offenders commit acts of general recidivism; and (2) what is the likelihood that sexual offenders will commit acts of general recidivism. The five hypotheses are: (1) the degree of concentrated disadvantage will be positively related to residential status; (2) the amount of residential stability will be negatively related to residential status; (3) the amount of ethnic heterogeneity will be positively related to residential status; (4) residential status will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity; and (5) general recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity.

The main objectives of this study are to describe and predict where sexual offender registrants live, and where they have recidivism. On a descriptive level, this research portrays the percentages and likelihoods that sexual offenders have for general recidivism. In terms of predictions, this study tests social disorganization theory for predicting neighborhood-level residential status and general recidivism for sexual offenders. With this introduction, more specific aspects of this research design will follow including sections on the sample, protection of human subjects, dependent variables, independent variables, data sets, measurement reliability and validity, and data analysis.

Sample

The sampling frame consists of the 143 census tracts in Mecklenburg County, North Carolina (Charlotte metropolitan area). However, census tract two will be excluded from the research because it has no reported residents (Charlotte's business

district) leaving 142 census tracts for analysis. These 142 census tracts are organized numerically beginning with census tract one, which is located in Charlotte's downtown business district, and proceed to increase numerically eventually ending with tract 64.02, which is located in the northern part of Mecklenburg County. Although there are no perfect correlations among the census tracts' identified number (1 through 64.02) and demographic characteristics there are some interesting trends. These observations included that tracts with smaller numbers were clustered around downtown Charlotte, were more densely populated, and were geographically smaller; while tracts with larger numbers tended to be located around the outskirts of Mecklenburg County, were less densely populated, and tended to be geographically larger (2000 US Census Bureau). As previously mentioned, the 142 census tracts will be an approximation for neighborhoods across Mecklenburg County.

In addition, a second sample of 189 registered sexual offenders from Mecklenburg County help to (1) formulate dependent variables, and (2) answer both research questions. These individuals were required to register as a sexual offender in Mecklenburg County, North Carolina during the years 2000 to 2002. What these research participants had in common was that they had all been convicted of an offense that required mandatory sexual offender registration (chapter 14 of the North Carolina State statutes). But, the research participants displayed variability in terms of why they had to register in Mecklenburg County during the three-year time-span. Some registered because they were released from an institutional setting into a Mecklenburg County neighborhood, others were convicted of an offense but were not placed in an institutional setting but instead remained in the community on probation, and finally others registered

because they moved into Mecklenburg County from another county or another state.

Protection of Human Subjects

This researcher took multiple safeguards to ensure that information on all sexual offender registrants remains confidential, despite the fact the data are made public. For example, all possible personal identifiers including the participants' names, and information on home or recidivism addresses were only known by the members of the dissertation committee and this researcher. Further, all personal identifiers were shredded immediately after the data was collected and inputted into SPSS software. It is true that the data in this research is made available to the public, however it will be treated as highly sensitive and kept confidential to avoid any potential hazards that may occur to the sexual offenders. Finally, approval was sought from the institutional review board (IRB) that was affiliated with The Ohio State University to supplement the aforementioned measures.

Data Sets

In this section more details are provided on the six data sets: 2000 US Census Bureau Survey, Mecklenburg County Sheriff's Office, Mecklenburg County Clerk of Courts, Charlotte Police Department, plus state sex offender registries and state department of corrections. First, data from *2000 US Census Bureau Survey* approximates the three exogenous constructs of social disorganization theory: concentrated disadvantage, residential stability, and ethnic heterogeneity. Six independent variables are proxies for these three exogenous constructs, and these variables are made operational through census bureau data. The 2000 Census Bureau Survey aggregates data into many

levels including federal, state, county, municipal, zip code, and census tract. Data aggregated to census tracts approximate neighborhood influences in this research.

Mecklenburg County Sheriff's Office supplies data for the 189 sexual offender registrants. This data contains pertinent pieces of information including the names, home addresses (street address, zip code, and municipality), and dates (day, month, and year) of registration in Mecklenburg County. The home addresses are crucial to this research as they will determine if a census tract has a sexual offender resident, and this in-turn will contribute toward formulating the dependent variable residential status. The conversion of home addresses to census tracts can be parsimoniously accomplished by inputting street addresses, zip codes, and municipalities into the gateway function of the US Census Bureau website, and the website will identify census tracts for the home addresses. In terms of registration dates, this information is important because it demarcates the beginning of recidivism tracking for each sexual offender. In contrast, the date 12/31/08 will uniformly terminate the tracking of recidivism for all sexual offenders.

The data from Mecklenburg County Sheriff's Office benefits this research for two salient reasons. First, the three-year time-span from 01/01/2000 to 12/31/2002 represents the first years that Mecklenburg County began collecting detailed information on sexual offender registrants. Second, this data will enable a sound measure of recidivism due to the fact that as a group the sexual offenders will have an opportunity to be tracked for an average duration of over seven years-07/01/01 to 12/31/08 (07/01/01-median date between 01/01/2000 & 12/31/2002). Research revealed that recidivism was positively associated with duration of the tracking period (Hanson et al. 1993; Looman et al. 2000; Serin et al. 2001; Vogel et al., 2004).

The third, fourth, fifth, and sixth data sets, *Mecklenburg County Clerk of Courts*, *Charlotte Police Department*, *plus state sexual offender registries and state department of corrections* provide additional data for the research. The *Mecklenburg County Clerk of Courts and Charlotte Police Department* have files on all of the sexual offenders, and these files contain information on the first arrest each sexual offender has post registration. More specifically, when the individual has an arrest the files include information on the type of offense and location (street address, zip code, and municipality) where the arrest occurred. Again these arrest locations can then be parsimoniously converted into census tract where recidivism occurs by inputting the street address, zip code, and municipality into the gateway function of the 2000 US Census Bureau website, and the website will identify census tracts for the arrest locations, and this will contribute towards formulating the variable general recidivism.

However, some arrests occur in a census tract outside of Mecklenburg County, and these arrests are excluded from hypotheses testing, but are included for answering research questions one and two. The reasons for this are (1) the units of analysis for this research are census tracts in Mecklenburg County, and subsequently (2) no demographic data are collected on census tracts outside of Mecklenburg County's parameters. Nonetheless, out of county and out of state acts of recidivism are tracked by reviewing the *state department of corrections and state sex offender registries* in all jurisdictions where the sexual offenders reside. Residential transitions out of Mecklenburg County by the sexual offenders are monitored by examining the required *intent to move notifications*. These notifications are found in Mecklenburg County Clerk of Court records. Finally, *North Carolina Department of Corrections* provides data on ages, races,

and genders of the sexual offenders, and is also used to gather information on out of county arrests.

Arrests are operationalized as reflecting recidivism because more observations will be detected as compared to using convictions or incarcerations (Andrews & Bonta, 2003; Hanson & Bussiere, 1998). The rationale for this is arrests can be dropped thus negating a potential conviction, and similarly convictions do not always require a return to a correctional setting. Subsequently, arguments can be made that arrests more accurately reflects recidivism because most sexual offenses do not get detected (Ahlmeier et al., 2000; Andrews and Bonta, 2003). Additionally, sexual offender recidivism studies often used arrests as an outcome measure (Firestone et al. 1999; Greenberg et al. 2000; Hall, 1995; Hanson & Bussiere, 1998; Looman et al., 2000; Proulx et al. 1997; Serin et al 2001). For this current study, acts of recidivism consist of first arrests that the 189 sexual offenders enact after they register in Mecklenburg County.

Data Issues

Due to issues with the data, four modifications to the methodology are occurring to better accommodate the data distributions. The first involves the research questions and hypotheses, the second is skewness and kurtosis values for the variable unemployment, the third involves modifications to the multivariate analysis, and the fourth pertains to modifications to the variable ethnic heterogeneity. First, the original research questions and hypotheses, as stated in chapter one were:

Research Questions

1. What percentages of sexual offenders commit acts of general recidivism?

2. What percentages of sexual offenders commit acts of sexual recidivism?
3. What is the likelihood of sexual offenders committing acts of general recidivism?
4. What is the likelihood of sexual offenders committing acts of sexual recidivism?

Hypotheses

1. The degree of concentrated disadvantage will be positively related to residential status.
2. The amount of residential stability will be negatively related to residential status.
3. The amount of ethnic heterogeneity will be positively related to residential status.
4. Residential status will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity.
5. General recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity.
6. Sexual recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity.

However data are not available for answering research questions two and four, and for testing hypothesis six and therefore they will be deleted from the research. The reason for this is that only 9 out of 100 acts of recidivism are for sexual offenses. Therefore these 9 arrests, coupled with the other 91 arrests will be collapsed into one category (e.g. general recidivism).

The second issue, high skewness and kurtosis values for the variable unemployment, indicate that modifications need to be made to account for data distribution violations. Whereas, the skewness value of unemployment is 3.86 and kurtosis value is 21.05, and these values exceed the thresholds of 3 for skewness and 10 for kurtosis that indicate a distribution violation (Kline, 1998). To account for, and

remedy these violations the square root for unemployment will be used in all bivariate and multivariate analyses (Alexander, 2005). After the square root computations are made the skewness value drops to 1.50, and kurtosis value drops to 4.95.

The third issue involves modifying the multivariate analyses from OLS multiple regression modeling to logistic regression modeling. The initial intention of this researcher was to use OLS multiple regression modeling as the dependent variables were going to be expressed as rates per 1,000 residents. However these analyses would be inappropriate due to lack of variability in the dependent variables. More specifically, if rates per 1,000 residents were used, the mean rate for general recidivism was .19 and standard deviation is .51, while the mean rate for neighborhood concentration was .26 and standard deviation is .45. Thus it would have been difficult to make meaningful interpretations of the analyses when the variability of the dependent variables was expressed in fractions of an individual.

However, logistic regression modeling is more appropriate with the dependent variables if they are dummy-coded with values of zero and one. Dichotomous variables that are dummy-coded approximate interval/ratio level of measurements and these data can be used to determine the odds of an event occurring (Menard, 2002). For this dissertation, the event occurring for residential status is a census tract has a sexual offender resident, and the event occurring for general recidivism is a census tract has recidivism. To compute these dummy variables, census tracts that have rates of zero for neighborhood concentration, and rates of zero for general recidivism are assigned a value of 0 indicating the event has not occurred. For residential status, 70 census tracts (49.30%) have neighborhood concentration rates of 0.00 and therefore are assigned a

dummy-code of 0. Seventy-two census tracts (50.70%) have neighborhood concentrations rates above zero (e.g. have at least one sex offender resident) and therefore these tracts are assigned a dummy-code of one. For general recidivism, 91 census tracts (64.10%) have general recidivism rates of 0.00 and therefore are assigned a value of 0. Fifty-one census tracts (35.90%) have general recidivism rates above zero (e.g. have at least one act of recidivism) and therefore are assigned a dummy-code of one.

The fourth issue involves modifying the variable ethnic heterogeneity before it is entered into the logistic regression equations (hypotheses four and five). The rationale for this is the variable ranges from zero to one with scores closer to zero representing low heterogeneity, and scores closer to one representing high heterogeneity. However, logistic regression estimates the changes in odds that an event will occur as a result of a one-unit unit change for an independent variable, and it is conceptually difficult to quantify a unit change for a variable that ranges from zero to one. To resolve this issue ethnic heterogeneity is multiplied by 100, transforming the range of the variable from .01 - .71 to 1.00 - 71.00

Dependent Variables

The two dependent variables in this research are: *residential status*, and *general recidivism*. Appendix A on page 91 of this text helps the reader understand how the variables are operationalized, and appendix B on page 94 helps the reader understand how data will be coded for data collection and analysis. In terms of research question one, percentage of general recidivism refers to the percentage of sexual offenders that are arrested. The likelihood of general recidivism, as indicated in question two, is the function of the time (e.g. in months) that an individual “survives” before getting arrested

for an offense.

The dependent variable *residential status* provides data for testing hypotheses one through four. This variable entails placing each one of the sexual offender registrants into one of Mecklenburg Counties 142 census tracts based on their home addresses. Then census tracts with sexual offender residents are coded one, while tracts without sexual offender residents are coded zero. The dependent variable *general recidivism* is used for testing hypotheses five. General recidivism uses information on the locations of arrests. This variable entails placing the each arrest into one of Mecklenburg Counties 142 census tracts based on the locations of the arrests. Then census tracts with sexual offender recidivism are coded one, while tracts without sexual offender recidivism are coded zero.

Independent Variables

As noted, six independent variables will approximate the three exogenous constructs of social disorganization theory (e.g. concentrated disadvantage, residential stability, and ethnic heterogeneity). Five out of the six variables are operationalized as percentages aggregated to the census tract level, while the sixth variable, ethnic heterogeneity is a index that ranges from 0 to 1. Appendix A on page 91 of this document helps the reader understand how the variables will be coded for data collection and analysis, and appendix B on page 94 helps the reader understand the operational definitions for the variables.

The first construct, *concentrated disadvantage* is operationalized by three proxy variables: individual poverty, family poverty, and unemployment. These three

approximations of concentrated disadvantage were prevalent in the literature on social disorganization theory (Morenoff et al. 2001; Osgood & Chambers, 2000; Peterson et al. 2000; Rountree & Warner, 1999; Sampson et al. 1999; Sampson et al. 1997). While the second construct, *residential stability* consists of two proxy variables: owner-occupied dwellings and residential consistency (e.g. residents who have lived in the same dwelling for at least five years). And again these two approximations for residential stability were prevalent in the social disorganization literature (Morenoff et al.; Mustaine et al. 2006; Peterson et al.; Sampson et al.; Sampson et al.).

The third construct, *ethnic heterogeneity* is approximated by an index (e.g. $1 - \sum P_i^2$) that is operationalized as one minus the sum of the squared proportion of census tract residents in each racial group (Blau, 1977). In this equation the \sum = sum, P_i = proportion of a racial group in a census tract, and 2 = squared. The scores for the index can range from zero to one with scores closer to zero indicating low heterogeneity in a neighborhood, while scores closer to one indicate high heterogeneity in a neighborhood. For instance, a neighborhood will have an index score of .02 if 99% of the residents are of one race. However, the index score increases to .76 if a neighborhood is composed of 4 different races, and each race accounts for 25% of the total population. In this research the four racial groups included in the index score are Asian, black, Hispanic, and white because these groups account for 99% of Mecklenburg County's residents. Unlike the other two exogenous constructs in this study, concentrated disadvantage and residential stability, there has been some inconsistency in how ethnic heterogeneity has been operationalized. Some research has approximated ethnic heterogeneity through measuring percentage of black residents, while other studies have used percentage of

non-whites residents (Sampson et al. 1997; Veysey & Messner, 1999). However, this current study uses the ethnic heterogeneity index because it more closely approximates racial diversity than analyzing percentages black, or percentages non-white (Blau, 1977).

Measurement Reliability and Validity

Data from 2000 US Census Survey, Mecklenburg County Sheriff's Office, Mecklenburg County Clerk of Courts, Charlotte Police Department, plus state sex offender registries and departments of correction all have reliability and face validity. These data sets represent secondary data, whereas Census Survey data are from 2000, data from Mecklenburg County Sheriff's Office represents information from the years 2000 to 2002, and data from Mecklenburg County Clerk of Courts, Charlotte Police Department, state sex offender registries, and state departments of corrections represent information from the years 2000 and 2008. In terms of the 2000 US Census Bureau survey, researchers have found that the data were appropriate for approximating characteristics of socially disorganized neighborhoods (Bellair, 1997; Osgood & Chambers, 2000; Morenoff et al. 1999; Morenoff et al. 2001; Sampson & Groves, 1989; Sampson, et al. 1997; Veysey & Messner, 1999). For official crime and law enforcement data, the literature noted that these data sources have been found to be consistent and accurate for measuring recidivism among the sex offenders (Andrews & Bonta, 2003; Hanson & Bussiere, 1998).

Data Analysis

This research uses descriptive statistics, including a Kaplan-Meier survival analysis estimator, Pearson's correlation for displaying bivariate relationships among the

dependent and independent variables, and logistic regression models for displaying multivariate relationships among the dependent and independent variables. As for the descriptive statistics, means and standard deviations are formulated for all interval/ratio level variables, and modes and percentages are formulated for all nominal level variables. Then, a Kaplan-Meier survival analysis estimator (KMSA) describes the likelihoods for general recidivism during the 100 months that arrests are tracked. This research benefits from the KMSA because it generates tables and plots of survival for event history data (Kaplan & Meier, 1958). Further, the KMSA is a descriptive procedure for event history analysis and is appropriate for analyzing data when time is considered the only correlate with the event (Kaplan & Meier, 1958).

Next, Pearson's correlations are displayed to demonstrate the bivariate relationships among the dependent and independent variables. Pearson's correlations are chosen because it is appropriate for testing the correlations between interval/ratio variables, and between interval/ratio and dichotomous nominal variables (Glass & Hopkins, 1996). In this research the six independent variables are all at the interval/ratio level of measurement, and the two dependent variables are dummy-coded with values of zero and one, and therefore approximate interval level measures (Menard, 2002).

In terms of the multivariate analysis, logistic regression equations will be used for testing hypotheses four and five which postulates that residential status and general recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity. Logistic regression is selected because the two dependent variables are nominal, dichotomous, and dummy-coded with categories of zero and one (e.g. 0 = census tracts

without sex offender residents, or general recidivism; 1 = census tracts with sex offender residents, and general recidivism), and the six independent variables are interval/ratio. Menard (2002) described how logistic regression was mathematically appropriate to implement when the outcome variables were dichotomous and nominal, and the independent variables were interval/ratio. Finally, all hypotheses are tested at a significance level of $p < .05$.

Chapter Four: Data Analysis

Descriptive Analysis

Table one displays the means, standard deviations, and ranges for the research variables from the 142 census tracts and 189 sexual offenders. Combined, these statistics illustrate descriptive figures for interval/ratio level measures, and all variables are expressed in percentages with the exceptions of population, heterogeneity index, age, and months survived before arrest. Population is a straight forward measure of the mean population, standard deviation, and population ranges for the 142 census tracts. While the heterogeneity index, one of the dissertations independent variables, can range between 0 and 1, where scores closer to 0 = low heterogeneity in a census tract, and scores closer to 1 = high heterogeneity in a census tract. Age and months survived before arrest are also straight forward measures of the mean, standard deviations, and ranges for the ages of the sex offender registrants, and the months survived before the sex offender registrants are arrested. Table one illustrates that the mean population is 4842.60 (SD = 2190.68), mean heterogeneity index is .36 (SD = .19), mean age is 36.04 (SD = 10.54), and mean months survived before arrest is 58.93 (SD = 37.77).

Table one also displays descriptive statistics for the remaining five independent variables including individual poverty, family poverty, and unemployment (concentrated disadvantage); plus owner-occupied dwellings, and at least five years in the same

dwelling (residential stability). As for the three variables that encompass concentrated

Variable	Mean	SD	Range
Population	4842.60	2190.68	422 – 11554
Individual Poverty	11.48	10.68	.82 - 50.40
Family Poverty	8.60	9.60	.00 - 47.30
Unemployment	4.12	4.23	.00 - 34.20
Owner-Occupied Dwellings	57.80	23.18	5.12 - 95.59
Five Years at Residence	44.41	11.96	15.40 - 75.70
Asian	2.93	2.16	.00 - 13.60
Black	31.26	29.16	1.60 - 99.30
Hispanic	5.97	6.85	.10 - 44.30
White	59.26	31.49	.10 - 98.70
Heterogeneity Index	.36	.19	.01 - .71
Age	36.04	10.54	19 – 76
Months Survived Before Arrest	58.93	37.77	0 – 100

Table 1. Interval/Ratio Research Variables

Notes. Data are from 2000 census survey for 142 census tracts in Mecklenburg County, North Carolina; and sexual offender registrants from Mecklenburg County from the years 2000-2002

disadvantage, the mean level of individual poverty is 11.48% (SD = 10.68%), family poverty is 8.60% (SD = 9.60%), and unemployment is 4.12% (SD = 4.23%). In terms of the two variables that encompass residential stability, the mean level of owner-occupied dwellings is 57.80% (SD = 23.18%), and residential stability is 44.41% (SD = 11.96%). Finally, table one also describes the racial compositions of the census tracts as the mean white residents is 59.26%, mean black residents is 31.26%, mean Hispanic residents is 5.97%, and mean Asian residents is 2.93%

Descriptive statistics for nominal level variables are found in table two, and these variables also pertain to the 142 census tracts and 189 sexual offenders. The three variables that describe the sexual offender registrants are race, which has black as the

Variable	N	%
Race	--	--
Asian	1	.50
Black	119	63.30
Hispanic	0	.00
White	67	35.60
Other	1	.50
Total	188	100.00
Gender	--	--
Female	6	3.17
Male	183	96.83
Total	189	100.00
Registration Status	--	--
Compliant	124	76.07
Non-Compliant	39	23.93
Total	163	100.00
Residential Status	--	--
Tracts with Sex Offender Residents	72	50.70
Tracts without Sex Offender Residents	70	49.30
Total	142	100.00
General Recidivism	--	--
Tracts with Recidivism	51	35.90
Tracts without Recidivism	91	64.10
Total	142	100.00

Table 2. Nominal Research Variables

Notes. Data are from 2000 census survey for 142 census tracts in Mecklenburg County, North Carolina; and sexual offender registrants in Mecklenburg County from the Years 2000-2002.

largest category at N = 119 (63.30%), while gender has male as the largest category at N = 183 (96.83%), and registration status has compliant as the largest category at N = 124 (76.07%). In terms of race, information is unknown about the racial status of 1 sex offender registrants and therefore the N = 188 for this variable. As for registration status, information is unknown about 26 sexual offender registrants and therefore the N = 163 for this variable. Registration status is a nominal and dichotomous variable that indicates whether a sexual offender is registration compliant, or whether there is a failure to register. In North Carolina, according to state statute 14-208.11, failure to register is a class F felony and is punishable for up to twenty years of incarceration, and therefore it is included in this dissertation as reflecting recidivism. Registration status will be used in an exploratory analysis at the end of the chapter. The final two variables, residential status and general recidivism are both dependent variables. Residential status has tracts with sex offender registrants as the largest category at N = 72 (50.70%), while general recidivism has tracts without recidivism as the largest category at N = 91 (64.10%).

The answer to research *question one* on what percentages of sexual offenders commit acts of general recidivism is 61.35%. More specifically, 100 out of 163 sex offender registrants are arrested during the 100 months of recidivism tracking. Table three highlights the types, frequencies, and percentages of these arrests. Overall, failure to register is the most prevalent arrest type at 39%, followed by drug and alcohol offenses at 16%, and assaults at 15%. Larceny and robbery, the fourth and fifth most prevalent arrest types, are at 4%, and then rape is the sixth most prevalent arrest type at 3%.

The answer to research question two on the likelihoods of sexual offenders committing acts of general recidivism will be answered with a KMSA. For this

dissertation, the answer to research question two on the likelihoods of sex offender recidivism will be analyzed in months, not days or years. The reasons for this are that the

Type of General Recidivism	N	%
Failure to Register	39	39.00
Drug or Alcohol Offense	16	16.00
Assault	15	15.00
Larceny	4	4.00
Robbery	4	4.00
Rape	3	3.00
Breaking and Entering	2	2.00
Carrying a Concealed Weapon	2	2.00
Fugitive from another State	2	2.00
Harassing Phone Calls	2	2.00
Sexual Offense	2	2.00
Writing Bad Checks	2	2.00
Burglary	1	1.00
Forgery	1	1.00
Homicide	1	1.00
Indecent Exposure	1	1.00
Indecent Liberties with a minor	1	1.00
Kidnapping	1	1.00
Sexual Exploitation	1	1.00
Total Arrests	100	100.00

Table 3. General Recidivism by Arrest Types

Notes. Data are from sex offender registrants in Mecklenburg County from the Years 2000-2002.

survival table indicates that the proportions of arrests tend to change from month to month. Whereas, annual durations will not demonstrate the nuances or fluctuations among the months, and daily durations are redundant as not many arrests occur among the days in any given month. This text will report the proportions arrested at 3, 6, 9, and 12 month increments, and then annual proportions will be displayed through year eight or 96 months. The survival function will be displayed so readers can visually inspect the survival trends throughout the 100 months that recidivism is tracked. The answer to

research *question two* will be answered with a survival table and a survival function, which is found in figure one. To begin, the survival table indicates that the range of

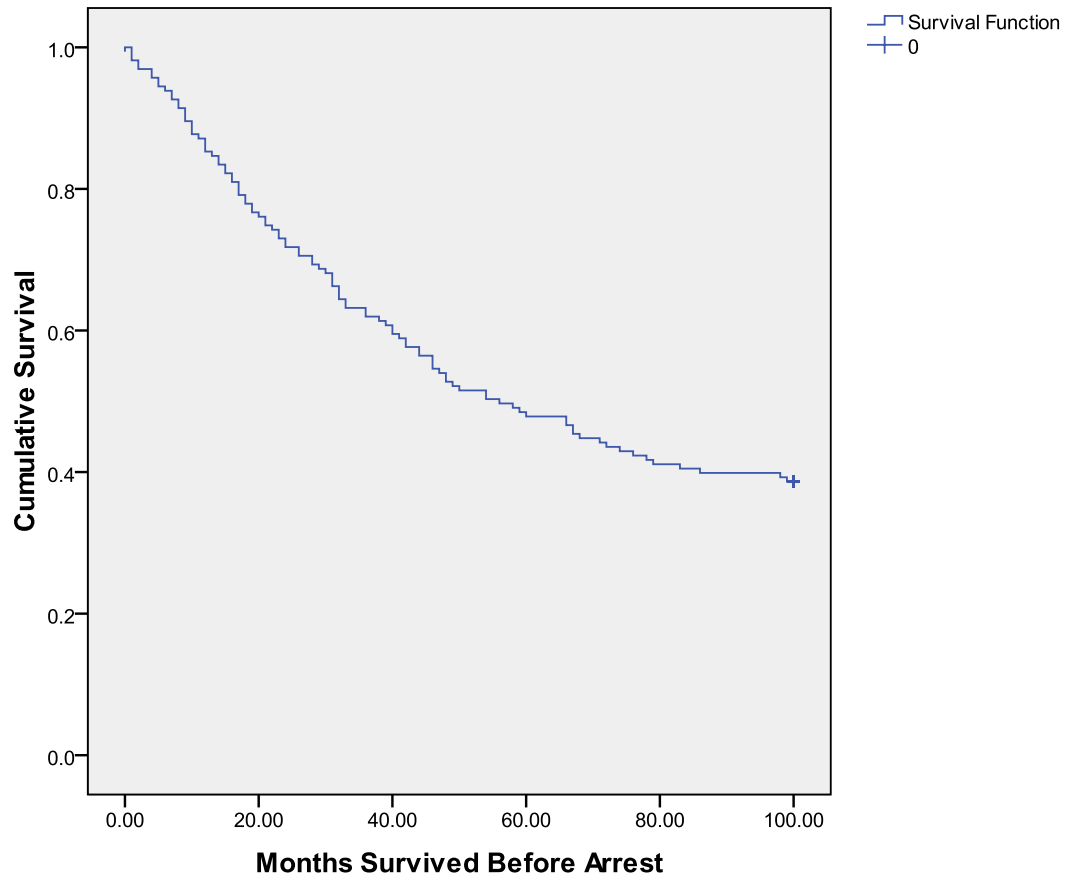


Figure 1: Survival Function for General Recidivism

general arrests begins at 1 month into recidivism tracking, and ends with the last detected arrest for a general recidivism at 99 months into the tracking period. More specifically, at 3 months a proportion .03 of the total number of arrests has occurred, at 6 months a proportion of .06 of the total arrests has occurred, and at 9 months a proportion of .10 of the total number of arrests has occurred. After one year of recidivism tracking a proportion of .15 of the total number of arrests has occurred and this proportion accounts

for 9% of the sexual offenders. At 2, 3, 4, 5, 6, 7, and 8 year increments the proportions arrested out of the total number of arrests are .13 (9% of the sexual offenders), .10 (7% of the sexual offenders), .09 (7% of the sexual offenders), .05 (4% of the sexual offenders), .04 (3% of the sexual offenders), .03 (3% of the sexual offenders), and .01 (1% of the sexual offenders) respectively. After 100 months of tracking a proportion of .39 cases ($n = 63$) are censored without having recidivism. Figure one displays the survival function for general recidivism.

Bivariate Analysis

Table four is a correlation matrix for nine variables involved in the hypothesis testing including two dependent variables, residential status and general recidivism; six independent variables including individual poverty, family poverty, unemployment, owner-occupied dwellings, residential consistency, and ethnic heterogeneity; plus one emerging variable, registration status, which will be used later in a Cox's proportional hazards model. The variables in the matrix are macro-level data aggregated to the 142 census tracts across Mecklenburg County. The first three hypotheses; (1) the degree of concentrated disadvantage will be positively related to residential status; (2) the amount of residential stability will be negatively related to residential status; and (3) the amount of ethnic heterogeneity will be positively related to residential status are all tested directly from the matrix. The *first research hypothesis*, the degree of concentrated disadvantage will be positively related to residential status is mostly supported. Individual poverty and family poverty are statistically related to residential status. Individual poverty and residential status has an $r = .17$, $p < .05$, while family poverty and residential status has an $r = .20$, $p < .05$. Individual and family poverty measures the percentage of individuals

and families that are impoverished in a census tract, while residential status dichotomizes census tracts with and without sexual offender residents. However, the relationship between unemployment and residential status is not supported at $r = .05$, ns.

Variables	1	2	3	4	5	6	7	8
1.Residential Status	--	--	--	--	--	--	--	--
2.General Recidivism	.33**	--	--	--	--	--	--	--
3.Registration Status	.26**	.60**	--	--	--	--	--	--
4.Individual Poverty	.17*	.40**	.21**	--	--	--	--	--
5.Family Poverty	.20*	.45**	.23**	.88**	--	--	--	--
6.Unemployment	.05	.34**	.21**	.54**	.54**	--	--	--
7.Owner-Occupied Dwellings	-.01	-.28**	-.18*	-.75**	-.62**	-.45**	--	--
8.Residential Consistency	.10	.06	-.04	-.02	.06	-.09	.35**	--
9.Ethnic Heterogeneity	.36**	.25**	.20*	.18*	.09	.06	-.33**	-.30**

Table 4. Correlations among neighborhood concentrations, general recidivism, registration status and six social disorganization predictors.

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

The *second research hypothesis*, the amount of residential stability will be negatively related to residential status is not supported for either owner-occupied dwellings or residential consistency. The *third research hypothesis*, the amount of ethnic heterogeneity will be positively related to residential status is supported. Ethnic

heterogeneity and residential status has an $r = .36$, $p < .01$. Ethnic heterogeneity is an index of the amount of racial heterogeneity among Asian, black, Hispanic, and white residents in a census tract. The variable ranges from zero to one with scores closer to zero representing low heterogeneity, and scores closer to one representing high heterogeneity.

Multivariate analysis

Hypothesis four postulates that residential status will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity; and hypothesis five postulates that general recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity. Again, logistic regression is chosen because both dependent variables are nominal and dichotomous, while the independent variables are interval/ratio. Table five displays the logistic regression models.

Hypothesis four is partially supported as model one is statistically significant with a -2 log likelihood of 156.31, chi square of 40.51, $df = 6$, $p < .01$. Owner-occupied dwellings and ethnic heterogeneity are statistically related to residential status with owner-occupied dwellings having a Wald statistic of 8.10, $p < .01$, and ethnic heterogeneity having a Wald statistic of 23.08, $p < .01$. Owner-occupied dwellings has an exp (B) of 1.05, meaning a 1 unit change in owner-occupied increases the odds by 5% that a tract will have a sexual offender resident. Ethnic heterogeneity has an exp (B) of 1.06, meaning a 1 unit change in ethnic heterogeneity increases the odds by 6% that a tract will have a sexual offender registrant. Residential status dichotomizes census tracts

with and without sexual offender residents; owner-occupied dwellings is a measure of the percentage of residents who own their place of residence; and ethnic heterogeneity is an index of the amount of racial heterogeneity among Asian, black, Hispanic, and white residents. This variable ranges from zero to one with scores closer to zero representing low heterogeneity in a census tract, while scores closer to one represent high heterogeneity.

Variables	Model 1					Model 2				
	B	SE	Wald	Sig	Exp (B)	B	SE	Wald	Sig	Exp (B)
Individual Poverty	.04	.05	.97	.32	1.05	-.05	.07	.46	.50	.95
Family Poverty	.07	.04	2.33	.13	1.07	.14	.07	4.44*	.04	1.15
Unemployment	-.06	.30	.04	.84	.94	.67	.39	3.02	.08	1.96
Owner-Occupied	.05	.02	8.10**	.00	1.05	.01	.02	.18	.68	1.01
Residential Consistency	.02	.02	1.44	.23	1.02	.02	.02	1.17	.28	1.02
Ethnic Heterogeneity	.06	.01	23.08**	.00	1.06	.04	.01	9.96**	.00	1.04
Constant	-6.86	1.73	15.81	.00	.00	-5.60	1.71	10.73	.00	.00
Nagelkerke R Square	.33					.37				

Table 5. Logistic models for regressing (1) neighborhood concentration onto social disorganization predictors, and (2) general recidivism onto social disorganization predictors

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

As for the classification table for model one, 71.4% of the census tracts that do not have sexual offender residents are predicted accurately, 75.0% of the census tracts that do have sexual offender residents are predicted accurately, and the classification table displays an overall percentage correct of 73.2%. Thus the classification table is a 22.5% improvement over the 50.7% correct classifications from the baseline table. Finally, the Nagelkerke pseudo R square for model one is .33.

Hypothesis five is also partially supported as model two is statistically significant with a -2 log likelihood of 140.79, chi-square of 44.64, $df = 6$, $p < .01$. Family poverty and ethnic heterogeneity are statistically related to general recidivism with family poverty having a Wald statistic of 4.44, $p < .05$, while ethnic heterogeneity has a Wald statistic of 9.96, $p < .01$. In addition, there are substantive implications for unemployment with a Wald statistic of 3.02, $p < .10$, ns. Family poverty has an exp (B) of 1.15, meaning a 1 unit change in family poverty increases the odds by 15% that a tract will have general recidivism. Ethnic heterogeneity has an exp (B) of 1.04, meaning a 1 unit change in ethnic heterogeneity increases the odds by 4% that a tract will have general recidivism. General recidivism dichotomizes census tracts with and without recidivism, while family poverty measures the percentage of families that are impoverished.

As for the classification table for model two, 82.4% of the census tracts that do not have general recidivism are predicted accurately, 60.8% of the census tracts that do have general recidivism are predicted accurately, and the classification table displays an overall percentage correct of 74.6%. Thus the classification table is a 10.5% improvement over the 64.1% correct classifications from the baseline table. Finally, the Nagelkerke pseudo R square for model two is .37.

Exploratory Analysis

As indicated in table two of this research, thirty-nine sexual offender registrants are arrested for failure to register. Thus, this finding makes it possible to explore (1) the likelihood sexual offenders have for failure to register, and (2) the neighborhood-level correlates that are associated to failure to register. To accomplish this analysis a survival table will identify the likelihood sexual offenders have for registration failures, while a

Cox proportional hazards model will explore the links among failures to register and neighborhood-level measures of individual poverty, family poverty, unemployment, owner-occupied dwellings, residential consistency, and ethnic heterogeneity. As a semi-parametric statistic, the Cox proportional hazards model is chosen for this analysis because it specifies a specific functional form, but is not sensitive to the distribution to the time of events (Allison, 1984). For this current project, this suggests that failure to register can be analyzed as a linear function of the independent variables despite the any peculiarities with the distribution of time to arrests. Registration status will be dummy-coded with sexual offender registrants who are compliant with registration being assigned a value of zero, and those who fail to register are assigned a value of one.

Similar to research question two in this dissertation, the likelihood of time for failure to register will be measured in months. However, this document will only report the annual proportions of sexual offenders that fail to register. The reasons for this are the survival table indicates that the proportions arrested for failure to register drops consistently from year to year, whereas monthly likelihoods are redundant as not many arrests occur among the months in any given year. This text will report the proportions of arrests at one, two, three, four, five, six, seven, and eight year increments. Also, the proportion censored after 100 month of recidivism tracking will be documented. The survival function will be displayed in figure two so readers can visually inspect the survival trends throughout the 100 months that failure to register is tracked.

The survival table for failure to register indicates that the range of arrests begins at month 2 month into recidivism tracking, and ends with the last detected arrest at 99 months into the tracking period. More specifically, at one year the proportion that fails to

register is .04 (3% of the sample), the proportion at the second year is .07 (7% of the sample), the proportion at the third year is .05 (4% of the sample), the proportion at the fourth year is .06 (5% of the sample), the proportion at the fifth year is

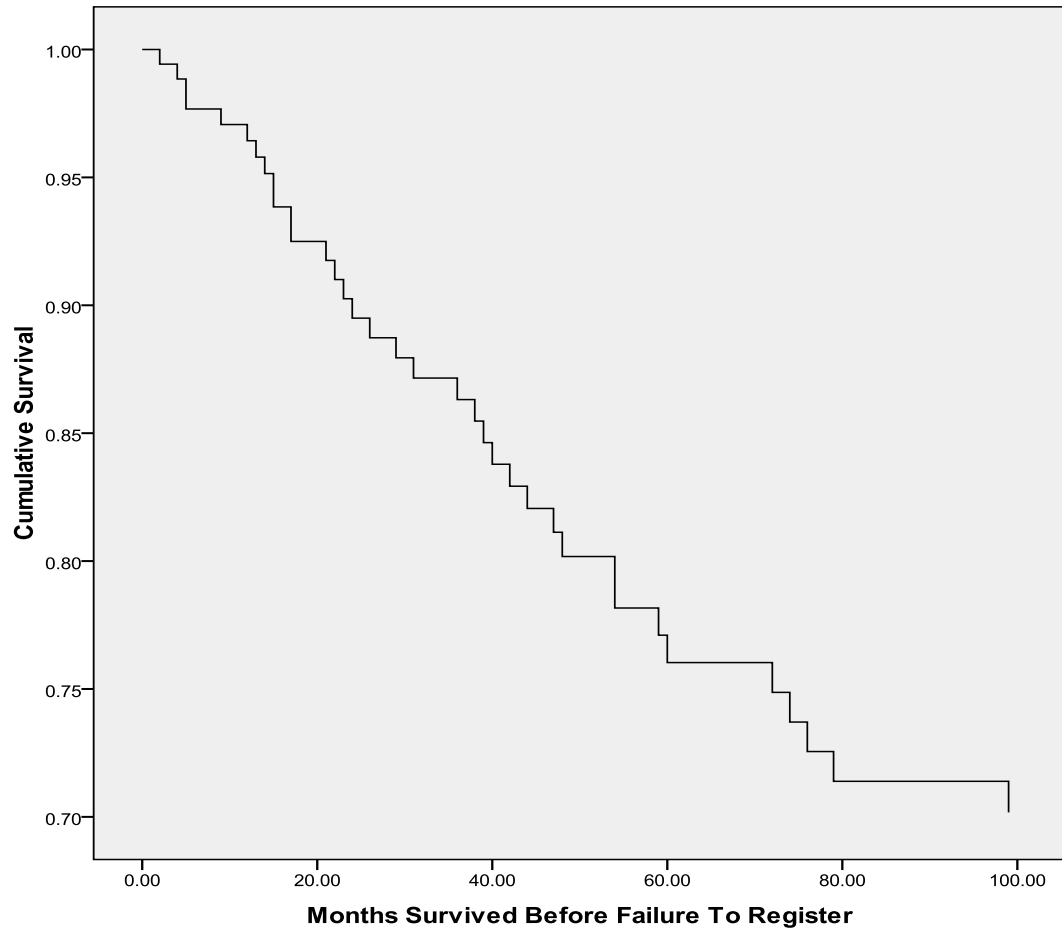


Figure 2: Survival Function at the Mean of Covariates

.04 (3% of the sample), the proportion at the sixth year is .01 (1% of the sample), the proportion at the seventh year is .03 (2% of the sample), and the proportion at the eighth year is .01 (1% of the sample). After 100 months of recidivism tracking a proportion of

.68 (n = 124) are censored without having a failure to register. Figure two displays the survival function at the means of the covariates.

In terms of the Cox regression model, it is significant with a -2 log likelihood of

Variables	B	SE	Wald	Sig	Exp (B)
Individual Poverty	-.03	.06	.23	.63	.97
Family Poverty	.03	.07	.28	.60	1.04
Unemployment	-.02	.21	.01	.94	.98
Owner-Occupied Dwellings	-.02	.02	1.98	.16	.98
Residential Consistency	.00	.02	.01	.94	1.00
Ethnic Heterogeneity	-.01	.01	.62	.43	.98
-2 Log Likelihood 320.96 Chi Square 12.93 DF 6 P < .05					

Table 6. Cox proportional hazards model for exploring the correlates of registration status.

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

320.96, chi-square of 12.93, df = 6, $p < .05$. However, there are no significant associations among any of the six neighborhood-level correlates and failure to register.

Table six displays the partial coefficients, standard errors of the partial coefficients, Wald statistics, significance levels, and standardized partial coefficients for the variables in the Cox regression model. As table six indicates there are no statistically or substantively significant correlates among the variables, despite the model being significant

Subsequently, each independent variable is entered into the model individually for the purpose of explaining why the Cox regression model is significant without any

significant correlates. Interestingly, individual poverty, family poverty, and owner-occupied dwellings are all statistically related to failure to register when each of the predictors are entered as the sole correlate. Individual poverty has a Wald statistic of 9.51, $p < .01$, exp (B) of 1.03 implying that a one-unit change to individual poverty increases the odds by 3% that there will be a failure to register. Family poverty has a Wald statistic of 10.49, $p < .01$, exp (B) of 1.04 implying that a one-unit change to family poverty increases the odds by 4% that there will be a failure to register. Owner-occupied dwellings has a Wald statistic of 9.34, $p < .01$, exp (B) of .98 implying that a one-unit change to owner-occupied dwellings decreases the odds by 2% that there will be a failure to register. This implies the possibility of a suppression effect, whereas the relationships among the three independent variables interact, which reduces the effects of any single correlate on failure to register.

Chapter Five: Discussion

Introduction

The original research questions and hypotheses for this research are listed in chapters one and three of this document. Due to limited observations of sexual recidivism, research questions two and four, plus hypothesis six are deleted from the analysis. Research question two is on the percentage of sexual offenders that commit acts of sexual recidivism, while research question four is on the likelihood of sexual offenders committing acts of sexual recidivism. Hypothesis six postulates that sexual recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity. In response, observations for sexual recidivism are included with all other acts of recidivism to produce the dependent variable general recidivism. This caveat precedes the following discussions of the research findings.

Summary of Findings

The findings show that over half of the sexual offenders have general recidivism, the risk of general recidivism lasts for over eight years, and that the general recidivism is for a wide variety of offenses. In summary, 100 sexual offenders are arrested which accounts for 61.35 % of the sample. Thirty-nine percent of the arrests are for failure to register, which is the most prevalent type, followed by drug and alcohol offenses at 16%,

and assaults at 15%. To add more depth to the findings, a Kaplan-Meier survival analysis estimator reveals interesting trends about the arrests. These trends are that the likelihood of being arrested is consistent during the first four years of tracking, then the proportions markedly decrease over the latter four years. Interestingly, the trends for the likelihood of failure to register display a similar pattern. In light of these outcomes is the finding that many sexual offenders are not arrested (e.g. 38.65%). Notwithstanding it must be reiterated, sexual offenders pose a long-term risk for committing general recidivism.

In terms of hypotheses testing, social disorganization theory is scrutinized for predicting residential status and general recidivism for sexual offenders. The first four hypotheses all use residential status as the dependent variable. Residential status is operationalized as census tracts either having, or not having a sexual offender resident. These four hypotheses are: (1) the degree of concentrated disadvantage will be positively related to residential status, (2) the amount of residential stability will be negatively related to residential status, (3) the amount of ethnic heterogeneity will be positively related to residential status, and (4) residential status will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity. Results for the first three hypotheses, which are all bivariate analyses, point-out that individual poverty, family poverty, and ethnic heterogeneity are statistically related to residential status. Further, these associations are in expected positive direction with increases in individual poverty, family poverty, and ethnic heterogeneity being associated with increases in residential status.

In terms of hypothesis four, the first logistic regression model illustrates that

owner-occupied dwellings and ethnic heterogeneity are statistically related to residential status. More specifically, higher amounts of owner-occupied dwellings and ethnic heterogeneity increase the odds ratio that a sexual offender will reside in a census tract. Surprisingly, the positive relationship between owner-occupied dwellings and residential status is counter to theoretical expectations. As for the classification table, the overall percentage correct is 73.2%., which is a 22.5% improvement over the 50.7% correct classifications from the baseline table. Further, the Nagelkerke pseudo R square for the model is .33.

Hypothesis five postulates that general recidivism will be predicted from a combination of the degree of concentrated disadvantage, the amount of residential stability, and the amount of ethnic heterogeneity. Results from the second logistic regression model which tests hypothesis five shows that family poverty and ethnic heterogeneity are statistically related to general recidivism, while there are substantive implications for unemployment. More specifically, higher amounts of family poverty and ethnic heterogeneity increase the odds ratio that general recidivism will occur in a census tract. As for the classification table, the overall percentage correct is 74.6%., which is a 10.5% improvement over the 64.1% correct classifications from the baseline table. The Nagelkerke pseudo R square for the model is .37. Finally, the exploratory analysis at the end of the results section identifies convoluted support for linking social disorganization theory to failure to register.

Context of Findings

General recidivism among sexual offenders is well documented in multiple settings, samples, and through a variety of outcome measures (Hanson & Bussiere, 1998).

Therefore the finding in this research that the sexual offenders have general recidivism is expected. However, the rate of 61.35% is higher than many of the other sexual offender recidivism studies (Hanson & Bussiere). In particular, the rate of recidivism in this research is markedly higher than 36.3% from the landmark sexual offender recidivism research by Hanson and Bussiere. The disparate outcomes between the studies may be explained by multiple factors including that this research uses arrests as approximating recidivism as compared to conviction measures that are predominate in Hanson and Bussiere's research. Another factor, duration of recidivism, may also influence the disparate outcomes as this research tracks recidivism for an average of over seven years in comparison to the average of four to five years in Hanson and Bussiere's research. Finally, many of the recidivism studies in Hanson and Bussiere's research were conducted in the 1980's and early 1990's prior to the implementation of sexual offender registration and community notification mandates, and therefore it was likely that less information was known about the sexual offenders which subsequently led to less recidivism being detected. Ironically, the recidivism rate for this research drops to 37% if failure to register is not included as a type of recidivism.

However, some sexual offender research did illustrate recidivism rates above 50% (Looman et al. 2000; Proulx et al. 1997; Quinsey et al. 1998; Rice et al. 1991). What most of these lines of inquiry included was recidivism tracking periods the last at least five years, and samples that were at a high-risk for recidivism. For comparative purposes, the 61.35% recidivism rate from this research can be contextualized parsimoniously within these outcomes. Yet, some literature did have sexual offender recidivism rates below 30%, but these studies included only sex offenses as a measure of

recidivism (Hall, 1995; Hanson, 2002), or tracked recidivism for less than five years (Seto & Barbaree, 1999).

In terms of the durations for tracking recidivism, research shows that the proportions of sexual offenders who survive without recidivism, similar to this research, tend to stabilize after six to seven years (Firestone et al. 1999; Greenburg et al. 2000). However, research also showed that the risk of recidivism can last for over 20 years (Hanson et al. 1993). One final note on recidivism from this research pertains to the high frequency of arrests for failure to register. Duwe and Donnay (2010), who found similar results, further determined that failure to register was not associated with any other types of general recidivism except for additional failures to register. Therefore, the 39 observations for failure to register in this research may not be a conceptual indicator of general recidivism, but may instead give credence to the arguments that the legislative mandates are ineffective (Petrosino & Petrosino, 1999), that sexual offenders lack understanding of registration requirements (Elbogen et al. 2003), that criminal justice professionals have difficulties managing sexual offenders (Zevitz & Farkas, 2000), or even the possibility that laws are unconstitutional (Winick, 1998).

In testing theory, variables from all three constructs (e.g. concentrated disadvantage, residential stability, and ethnic heterogeneity) predict residential status, while variables from two (e.g. concentrated disadvantage and ethnic heterogeneity) out of the three constructs predict general recidivism. However, ethnic heterogeneity is the only construct that consistently supports social disorganization theory in both bivariate and multivariate analyses, and for both outcome variables. Further, the relationships among general recidivism and the independent variables are easier to contextualize than the

relationships among residential status and the independent variables due to the availability of literature.

There is only one study that integrates an outcome that approximates residential status in the literature. This study was conducted by Mustaine et al. (2006), and similar to this current research, they found that family poverty, owner-occupied dwellings, and ethnic heterogeneity were different, while residential stability was not different between census tracts with and without sexual offender residents. However, Mustaine et al. (2006) used percentages of white residents in a census tract to approximate ethnic heterogeneity as opposed to a heterogeneity index. Further, Mustaine et al. determined value in other variables not included in this research including age, education, and female-headed households.

As mentioned, there is a substantial amount of social disorganization literature devoted to explaining and predicting crime. Thus there are conceptual and empirical foundations for contextualizing the recidivism outcomes from this study. This study reveals that five (e.g. residential consistency not statistically related) out of the six independent variables are statistically related to general recidivism on a bivariate level. However, only three variables display value during the multivariate analysis with ethnic heterogeneity and family poverty being statistically related to general recidivism, while unemployed has substantive implications.

Ethnic heterogeneity consistently explains crime across the social disorganization literature (Bellair, 1997; Morenoff et al. 2001; Sampson et al. 1997). In light of these observations, the outcome in this current research makes theoretical sense. However, social disorganization literature often approximates ethnicity with race which may be a

problematic inference. Additionally, research shows other social and physical characteristics of neighborhoods often mediated the effects of race on crime (McNulty & Holloway, 1997).

The relationship between concentrated disadvantage and crime was also consistently noted in the literature (Bellair, 1997; Morenoff et al. 2001; Osgood and Chamber, 2000; Peterson et. al. 2000). Therefore, it is not surprising that family poverty is statistically related, and unemployment is substantively related to general recidivism in this research. However, some of the literature combined all concentrated disadvantage variables into a composite index, and this in-turn was related to crime (Morenoff et al.; Peterson et. al.).

Out of the three exogenous constructs of social disorganization theory, residential stability is perhaps the most difficult construct to compare between the literature and this research. The literature consistently established that residential stability, as approximated by the variables owner-occupied dwellings and residential consistency, was related to multiple measures and types of crime. These trends held consistent whether the outcomes were based on official crime data (Peterson et al 2000; Osgood & Chambers, 2000), victimization surveys (Bellair, 1997), or self-reports (Morenoff et al. 2001; Sampson et al. 1997). However, the results of this research indicate that the two variables, owner-occupied dwellings and residential consistency have negligible impacts. In particular, the variable owner-occupied dwellings is statistically related to general recidivism, but only on a bivariate-level, while residential consistency has no relationships to general recidivism. Two plausible explanations for the research outcomes are an (1) inadequate sample size, or (2) simply that residential stability is not a

macro-level correlate of general recidivism for sexual offenders.

Implications of Findings

In this section the implications are addressed for (1) testing theory, and (2) informing the penology of sexual offenders. As for testing theory, social disorganization theory is scrutinized for predicting general recidivism and residential status for sexual offenders. Research revealed that social disorganization theory explained crime (Sampson & Groves, 1989; Veysey, & Messner, 1999), including sexual offenses (Peterson et al. 2000). However this research, unlike other studies from the literature, tests the applicability of the theory for sexual offenders.

The findings indicate mixed support for social disorganization theory at predicting general recidivism for sexual offenders. As for the three exogenous constructs, ethnic heterogeneity supports the theory, concentrated disadvantage displays mixed support, and residential consistency does not support the theory. In summary, neighborhoods with larger amounts of ethnic heterogeneity and family poverty are more likely to have general recidivism. As stated in chapter four, the exploratory analysis reveals convoluted support for linking the theory to failure to register.

Similar to general recidivism, the social disorganization theory receives mixed support for predicting residential status for sexual offenders. As for the three exogenous constructs, ethnic heterogeneity supports the theory, concentrated disadvantage displays mixed support, and residential stability does not support the theory. Neighborhoods with higher amounts of individual and family poverty, ethnic heterogeneity, and owner-occupied dwellings are more likely to have a sexual offender resident. However, the positive relationship between owner-occupied dwellings and residential status is counter

to theoretical expectations.

Overall, one exogenous construct of social disorganization theory, residential stability, does not support the theoretical predictions for either general recidivism or residential status. There are several plausible dynamics that may account for these findings, implications that can be explored in future research. First, research has revealed that infrequent interactions among neighborhood residents were negatively related to crime, contacts as sparse as one time per year (Bellair, 1997). Subsequently, living in the same neighborhood for multiple years, or owning a place a residence may not equate to residential stability in the 21st century. Further, arguments could be made that many individuals do not live in properties that they own, or that residential transitions could be a sign of affluence or economic hardship. This seems especially prudent when considering the chaotic housing and economic states of the past decade. Finally, it can be explored whether sexual offenders move to disorganized areas, or whether they live in a wide variety of ecological settings based on the conveniences of living with or among family, friends, or acquaintances.

In addition to the implications to testing theory, this study has ramifications for the penology of sexual offenders (Cowburn, 2000; Derezotes, 2000; Gentry et al. 2005; Grady, 2009; McCallum, 1997). These ramifications are framed within the findings that (1) sexual offenders have general recidivism, (2) the risk of recidivism lasts for years, and (3) many sexual offenders are arrested for failures to register, alcohol and drug offenses, and assaults. First, sexual offender treatment programs must adequately assess and treat substance abuse and anger management issues. Successful reentry into the community implies that sexual offenders refrain from all illegal activities, including the use or sale of

illegal substances. This seems particularly relevant when considering the links between substance use and general recidivism for sexual offenders (Hanson & Bussiere, 1998).

As for the assaults, they may result from poor anger management or impulse control issues. Therefore, successful reentry into the community may include sexual offenders learning and getting reinforcements for using adaptive coping mechanisms.

Further, it is not only important to assess and treat offenders, but also to track progress during treatment and aftercare phases. This may include having sexual offenders completing self-reports, and having professionals administer surveys or questionnaires. For instance, it would be helpful to track awareness and implementation of adaptive anger management strategies, and coping skills for managing cravings. Systemic collaboration can help facilitate these endeavors as inpatient and outpatient treatment providers, and community corrections officers can work in tandem to monitor sexual offenders. Some of these aforementioned suggestions may be idealistic as treatment providers and community corrections officers are under duress with limited time and resources. Also, there are limited resources in the community for treating substance abuse, and for monitoring sexual offenders for the years they may be at risk for recidivism.

Another crucial implication involves sexual offender specific treatment vs. general offender treatment. A considerable amount of time and resources have been dedicated toward facilitating sexual offender specific cognitive-behavioral interventions (Hall, 1995; Pithers, 1990). These treatments emphasized relapse preventions models (Pithers), and the most salient goal of the interventions was to reduce recidivism (Hall). However this research, along with the findings of other researchers (Hanson & Bussiere,

1998), reveals that sexual offenders have more non-sexual than sexual recidivism. As such, sexual offender specific treatment paradigms may be inappropriate because it is difficult to differentiate sexual offenders from non-sexual offenders in terms of types of recidivism, or psychosocial characteristics (Andrews & Bonta, 2003). The implications are that sexual offenders may benefit from the same treatments that have been effective for non-sexual offenders (Andrews & Bonta). However the one characteristic that may differentiate sexual offenders from non-sexual offenders is deviant sexual arousal (Andrews & Bonta; Hanson & Bussiere).

In regards to the failures to register, sexual offenders may need to be educated on the most current registration mandates. Research has found that sexual offenders did not completely understand the obligations for registration (Elbogen et al. 2003). As such, educational interventions may help improve rates of registration compliance. In terms of social policy or advocacy, legislative modifications may be appropriate when considering that failure to register is not correlated with any other types of recidivism besides additional failures to register (Duwe & Donnay, 2010)

Limitations of Study

There are limitations to the research which will be discussed in this section. These issues pertain to tracking recidivism, sample size, dependent variables, and independent variables. First, recidivism could not be tracked for the dependent variable (1) sexual recidivism, or for (2) 26 sexual offenders. The paucity of sexual recidivism observations may be a function of the operational definition of recidivism. In review, recidivism is operationalized as the first arrest for each sexual offender. However research has shown that sexual offenders commit multiple acts of recidivism (Hanson &

Bussiere, 1998). As a result, future projects will benefit from a more inclusive definition of recidivism, a measure that includes all offenses not solely the first. The implications for a more inclusive measure is that more acts of recidivism will be observed, which in turn will increase the probability that more acts of sexual recidivism will be detected. Coincidentally, more observations of recidivism will provide a more robust test of social disorganization theory because it can be analyzed whether the increased observations of recidivism are concentrated in socially disorganized neighborhoods.

The findings are also impacted by recidivism not being tracked for all sexual offenders. Most of these limitations emerged due to individuals moving out of Mecklenburg County to another county or state. Consequently, these residential transitions resulted in recidivism not being tracked for 26 (e.g. 13.76%) individuals. As such, the findings for research questions are affected. Future research will benefit from tracking samples of sexual offenders who are on probation or parole because the residential movements of these individuals are more thoroughly scrutinized.

In terms of sample size, this must be considered when interpreting the research findings. This study uses two samples (1) 189 sexual offenders and (2) 142 census tracts. As for the sample of sexual offenders, the sample size approximates some sexual offender recidivism studies (Marques et al. 1994; Quinsey et al. 1995; Rice et al. 1991), however many studies had larger samples of 300 to 500 individuals (Duwe & Donnay, 2009; Firestone et al. 1999; Greenburg et al. 2000; Proulx et al. 1997; Nunes, Hanson, Firestone, Moulden, Greenburg, & Bradford, 2007; Quinsey et al., 1998; Seto & Barbaree, 1999). In an effort to produce more robust outcomes, future research may increase sample sizes by combining sexual offender registrants from several counties, or

track recidivism from a statewide sample.

Due to issues with hypothesis testing, the sample size for the neighborhoods is more complicated. Kraemer and Thiemann (1987) pointed-out the repercussions of the sample size on effect size and type two errors. For instance, assume that the desired effect size for a two-tailed test at a $p < .05$ is $r = .20$. In this case a negligible statistical power of 50% can be achieved by having a sample of $n = 95$; a moderate statistical power of 70% can be achieved by having a sample of $n = 152$; and a high statistical power of 90% can be achieved by having a sample of $n = 257$ (Kraemer & Thiemann). However, decrease the desired effect size for a two-tailed test at a $p < .05$ to $r = .15$ and the respective sample sizes increase to 170, 272, and 461 (Kramer & Thiemann, 1987). Moving back to this current study, this researcher wants an effect size of .20 for a two-tailed test at a $p < .05$ because using a lower effect size will represent extremely low, or even negligible relationships (Davis, 1971). Given these parameters, a moderate statistical power of 70% can be achieved with an $n = 152$, while a high statistical power of 90% can be achieved by an $n = 257$. This research has a sample size of $n = 142$, indicating that the statistical power is just below 70%. To increase this figure to 80% or higher, future research can use sample sizes that approximate 200 to 225 neighborhoods, and this will minimize the possibility of type II errors.

The third limitation, *dependent variables*, pertains to measurement concerns for general recidivism and residential status. The issues for general recidivism have already been noted in this section. However there are also issues with the dependent variable residential status. In terms of theory, the predictions are that disorganized neighborhoods will have more sexual offender residents. This takes into consideration the assumption

that residential location is a choice for sexual offenders. However legislations have been ratified which brings into question the assumption of choice. Most relevant to this research is the 2006 North Carolina state statute 14-208.16 that requires sexual offenders to not live within 1,000 feet of a school or daycare. As a practical matter, it can be difficult to achieve this 1,000 foot barrier in a densely populated county such as Mecklenburg. Nonetheless, the results of this research are not affected by this law because residential status is based home addresses from the years 2000-2002. Yet, the utility of the results may come into question considering the current climate of limited residential options.

Research limitations also involve the *independent variables* of this study. As highlighted in chapters one and two of this document, social disorganization theory emerged during the 19th and early 20th century. During this era many immigrants from disparate countries and cultures were relocating, and it was plausible that differences in ethnicity would impede community cohesion. Ethnic disparities are still relevant in the 21st century, although the issues and dynamics of immigration are different. Social disorganization theory predicts that ethnic heterogeneity will be an ecological correlate of social phenomena, however this research and most tests of social disorganization theory approximates race for ethnicity. This can be a problematic inference as race refers to biological characteristics of a group, while ethnicity is a broader construct which pertains to the shared identity of a group, part of which may include race (Siegle, 2000). More specifically, ethnicity may pertain to the religions, customs, values, beliefs, languages, and races of a group of people. As such, future research can use a more inclusive definition of ethnic heterogeneity to encompass the multiple dynamics of a group's

shared identity.

Finally, another concern with the independent variables involves the lack of statistical predictions. While this research displays the utility of the independent variables, over half of the odds are not predicted in the logistic regression models. Therefore this research, similar to other social disorganization research, could include other independent variables to predict the outcomes. In particular, researchers found utility in the variables single-parent, or female-headed households (Bellair, 1997; Sampson et al. 1997; Schulenberg et al. 2003), or age and education (Mustaine et al. 2006). More independent variables may predict more odds ratios for the dependent variables.

Implications for Future Research

In terms of basic research, a replication study can be conducted that uses a more inclusive definition of recidivism, more predictor variables, larger sample sizes, and demographic correlates from the 2010 census survey. Additionally, variables from multiple theories can be compared for analyzing the paradigm(s) that receives the most support. For instance, a crucial test could be conducted between social disorganization and routine activities theories. Further, these theories could be integrated to determine the utility of using multiple paradigms. There are research implications for determining the geographical units which best approximate neighborhood influences. Future research can compare block groups, census tracts, zip codes, and neighborhood clusters to determine which entity best supports the theory.

Recidivism research may also be designed to understand the nuances and interactions of micro and macro-level risk factors. For instance, it is possible that

cognitive-behavioral theory explains recidivism on a micro-level, but that social disorganization theory explains recidivism when these individuals are nested within neighborhoods. Next, more research can be dedicated to understanding the dynamics of registration failures. This may involve interviewing sexual offenders, reviewing case notes, or reviewing state and federal legislations. These lines of inquiry may shed insight into whether the non-compliance stems from micro-level factors, or broader issues with criminal justice systems. Finally, more research can be dedicated to explaining the links between substance abuse and recidivism among sexual offenders. For instance, how prevalent is substance abuse and dependence, or to what extent is substance use a risk factor for sexual recidivism. One final note on future scholarship is that researchers must be cognizant of sexual offenders' heterogeneity. As such, this study could be replicated using disparate subtypes of sexual offenders, such as child molesters or rapists.

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Appendix A: Operational Definitions of Variables

<i>Dependent/Outcome Variables</i>	<i>Operational Definitions</i>
General Recidivism (micro-level)	Sex offender registrant's first arrest post registration
General Recidivism (macro-level)	Census tracts with and without general recidivism
Residential Status	Census tracts with and without sexual offender residents

Table 7: Dependent Variables

<i>Constructs</i>	<i>Variables</i>	<i>Operational Definitions: Data Aggregated to the Census Tract</i>
Concentrated Disadvantage	Individual poverty	Percentage of individuals below the poverty line
	Family poverty	Percentage of families below the poverty line
	Unemployed	Percentage unemployed
Residential Stability	Owner-occupied dwellings	Percentage of residents who own their dwellings
	Residential consistency	Percentage of residents who have resided in the same dwelling for at least five years
Ethnic Heterogeneity	Racial index	One minus the sum of the squared proportion of census tract residents in each racial group (Asian, Black, Hispanic, and White)

Table 8: Independent Variables

<i>Demographic Variables</i>	<i>Operational Definitions</i>
Race	Racial category identified in NCDOC, and Mecklenburg County Clerk of Courts
Sex	Gender identified in NCDOC, and Mecklenburg County Clerk of Courts
Age	Age of individual when registering in Mecklenburg County

Table 9: Demographics for Sexual Offenders

<i>Variables</i>	<i>Operational Definitions</i>
Registration Date	Month, day, and year of registration
Recidivism Date	Month, day, and year of arrest
Type of arrest	Type of suspected crime leading to arrest
Street Address of Registrant	Street address on sex offender registry
Municipality of Registrant	Municipality on sex offender registry
Zip Code of Registrant	Zip Code on sex offender registry
Census Tract of registrant	Census tract number where registrant lives
Population	Population size of census tract
Street Address of Recidivism	Street address where registrant is arrested
Municipality of Recidivism	Municipality where registrant is arrested
Zip Code of Recidivism	Zip Code where registrant is arrested
Census Tract of Recidivism	Census Tract where registrant is arrested
Asian	Percentage of Asian residents in a census tract
Black	Percentage of black residents in a census tract
Hispanic	Percentage of Hispanic residents in a census tract
White	Percentage of White residents in a census tract
Survival	Number of Months registrant survives in the community before getting arrested

Table 10: Additional Variables

Appendix B: Code Sheets

<i>Dependent/Outcome Variables</i>	<i>Codes</i>
General Recidivism (micro-level)	1 = Arson 2 = Assault 3 = Breaking and entering 4 = Burglary 5 = Drug Offense 6 = Forgery 7 = Homicide 8 = Larceny 9 = Kidnapping and abduction 10 = Prostitution 11 = Robbery 12 = Other general offense 13 = Exploiting a minor 14 = Incest 15 = Indecent exposure 16 = Promoting or participating in prostitution with a minor 17= Rape or attempted rape 18 = Sexual battery 19 = Sexual offenses with certain victims 20 = Solicitation of a child by a computer 21 = Taking indecent liberties with a child 22 = Failure to Register
General Recidivism (Macro-level)	0 = Census tract without general recidivism 1 = Census tract with general recidivism
Residential Status	0 = Census tract without sexual offender resident 1 = Census tract with sexual offender resident

Table 11: Dependent Variables

<i>Constructs</i>	<i>Variables</i>	<i>Codes: Data Aggregated to the Census Tract</i>
Concentrated Disadvantage	Individual poverty	Percentage
	Family poverty	Percentage
	Unemployed	Percentage
Residential Stability	Owner-Occupied dwellings	Percentage
	Residential consistency	Percentage
Ethnic Heterogeneity	Racial Index	0 to 1

Table 12: Independent Variables

<i>Demographic Variables</i>	<i>Codes</i>
Race	1 = Asian 2 = Black 3 = Hispanic 4 = White 5 = Other
Sex	1 = Female 2 = Male
Age	As Stated

Table 13: Demographics for Sexual Offenders

<i>Variables</i>	<i>Codes</i>
Registration Date	Month/Day/Year
Recidivism Date	Month/Day/Year
Street Address of (1) Registrant and (2) Recidivism	As stated
Municipality of (1) Registrant and (2) Recidivism	As stated
Zip Code of (1) Registrant and (2) Recidivism	As stated
Census Tract of (1) Registrant and (2) Recidivism	As stated
Population	As stated
Asian	Percentage
Black	Percentage
Hispanic	Percentage
White	Percentage
Survival	As stated

Table 14: Additional Variables