An Integrated Theoretical Model Explanation for Residential Burglary through Ordinary Least Squares Multivariate Regression in Dallas, Texas.

by

Adam David Sinnott

A thesis submitted to the faculty of Radford University in partial fulfillment for the requirements for the degree of Master of Arts in the Department of Criminal Justice

Thesis Advisor: Dr. ‘Shawn Smith

April 2020

Dr. 'Shawn Smith

Digitally signed by Dr. 'Shawn Smith
DN: cn=Dr. 'Shawn Smith, o=Radford University, ou=Department of Criminal Justice, email=ssmith479@radford.edu, c=US
Date: 2020.04.22 15:03:08 -04'00'

Dr. ‘Shawn Smith Thesis Advisor (Chair)	Date
	4/22/2020
Dr. Isaac Van Patten Committee Member	Date
	04/22/2020
Dr. Rachel B. Santos Committee Member	Date

ABSTRACT

The following thesis was heavily structured around a theoretical framework that combined operationalized variables from opportunity and social disorganization theories to create an integrated theoretical model, in attempts to better explain residential burglary of single-family households, rather than a theoretical model comprised of variables derived from a singular theory. Through a unique methodology and analytic strategy that had not been performed in prior, existing research, three variables representing each theory were combined and ran through several ordinary least squares, multivariate regression analyses to explain residential burglary in Dallas, Texas. Data was obtained from Dallas City Open Data and included all Dallas City Police Department incident reports of single-family home burglaries in 2016, which totaled to 4,212 geocoded incidents. The unit of analysis was at a block group level and included 713 block groups that experienced a burglary. Operationalized explanatory variables derived from the two theories included *housing tenure, poverty, racial heterogeneity*, *housing density*, the *proximity of access highway*, and the *proximity of prior burglary.* A final variable accounting for burglary lag was also created, after confirming and controlling for spatial autocorrelation. Results primarily provided support for existing literature discussing social disorganization theory while contributing to future research and the potential for replication using a similar methodology. Though, limited support was found for opportunity theory by way of the *proximity of prior burglary* variable. Several limitations are noted, and suggestions for future research and replication are included.

Adam David Sinnott, M.A.
Department of Criminal Justice, 2020
Radford University

DEDICATION

To the teenager who performed poorly in high school; that scrappy guy who walked around with a chip on his shoulder. You have believed that your life was defined by your physicality. Now, you understand your academic capabilities and your intellectual capacity is certain–you are unlimited and remain unsatisfied.

ACKNOWLEDGMENTS

I would like to acknowledge Dr. Smith and his position as Chair of my thesis committee. Not only did Dr. Smith embrace the role change from a committee member of my thesis to Chair in late August of 2019, but he also provided the unwavering guidance, structure, and a legitimate, palpable fascination with this project. My research would not have been possible without him. I would also like to thank my family, mentors, professors, and the significant individuals in my life who failed to falter.

TABLE OF CONTENTS

Page

LIST OF TABLES AND FIGURES

Chapter 1: Introduction

Criminal justice theories are based upon both speculation and prior evidence of explanations for a crime's occurrence. However, their ability to explain crime's occurrence and subsequently provide practical solutions to reduce the rate of occurrence is frequently questioned. Through the use of an integrated theoretical model framework involving two respective theories, their subsequent operationalized elements making up six independent variables, and based upon previous research, the problem of residential burglary will be examined and ultimately explained, as "research without theory has no foundation; likewise, theory depends on research to provide proof of the theories correctness" (Udo-Akang, 2012, p. 89).

The integrated theoretical model, specifically, was created to (i) identify what operationalized variable of each respective theory has the strongest relationship (and provides the best explanation) with residential burglary of single-family homes, (ii) determine the potential that opportunity and social disorganization theories have to coincide with and support each other in the explanation of residential burglary, and (iii) facilitate and promote the re-adjustment of theoretical model application and its future potential for explaining residential burglary. This thesis supported existing literature and research while contributing new literature to the field through a unique experimental design. There was no found research to date that followed the specific theoretical framework and methodology that this thesis included. The following sections introduce and expand on residential burglary's definition, historical overview, and current characteristics/statistics.

Chapter 2: The Problem of Residential Burglary

The FBI's Uniform Crime Report definition of burglary includes "the unlawful entry of a structure to commit a felony or theft," and this entry does not have to include any use of force (FBI, 2017). To narrow burglaries down to specifically residential, the Center for Problem-Oriented Policing's 60 Step Guide, Step 15 defines residential as a fixed location where individuals dwell and may include hotels, apartments, houses, and condominiums (PopCenter, 2019). This guide continues with classifying burglary as predatory behavior, meaning, the victim of the residential burglary is wholly distinctive from the offender and objects to the burglary's occurrence. The current thesis, however, is solely concerned with single-family household burglaries. This specific type of residence provides a different opportunity for burglary compared to apartments or condominiums. For example, this type of residence most likely contains more lucrative items within it compared to an apartment (Weisel, 2002). A justification for this factor could be explained by the financial status of the individuals within such residences, meaning individuals with a higher disposable income and who possess more assets could be more likely able to afford a single-family home and therefore reside in it instead of an apartment. A counterargument, however, is that a more affluent household could more likely contain anti-burglary measures.

The physical size of the home is also a factor to take into consideration. From a burglar's viewpoint, there will most likely be more vulnerable items in a single-family home than other residences, based on the amount of physical space. Lastly, single-family homes are more challenging to secure compared to other residences' styles due to their multiple access points (Weisel, 2002). From a *crime prevention through environmental design* (CPTED) perspective, these access points would appear as both physical access to the home via streets or walkways

(Lanier, Henry, & Anastasia, 2015), and the physical elements of the home that make it vulnerable to burglary, such as the number of windows and doors. The following section covers a brief historical overview of residential burglary as a crime.

Historical Overview

Research on residential burglary shows that offender-based studies centered around understanding the crime and its characteristics did not begin until the 1970s, and began to favor situational factors towards more innovative policy opportunities (Nee, 2003). This perspective, which would become rational choice theory, changed the notion that offenders are driven to engage in residential burglaries, into the proposal that they are responding to environmental characteristics (Nee, 2003). The new rhetoric suggested that residential burglaries may not only be committed by the career criminals, but also law-abiding citizens who decide to engage in the crime based upon specific environmental characteristics. Offender-based studies during the 1970s in Britain showed that burglars' decisions were based upon the perceived occupancy and security levels of potential targets (Nee, 2003).

In continuation, Nee described burglars during this period as searchers, which meant they would observe multiple areas and opportunities based upon the environment and then select a target. As homes advanced in technology and deterrence methods, so did the burglars' methods. For instance, when viewing homes with more exterior lights and cameras, potential burglars would tend to avoid these residences and search for more suitable targets (Nee, 2003).

In response to residential burglary, policies such as the Texas Castle Law Doctrine have been enacted to grant homeowners the use of deadly force against a burglar (Ren, Zhang, & Zhao, 2015). Research shows that this policy also provided a statistically significant deterrent

effect on future burglary through residential burglary reports in areas that upheld the policy (Ren et al., 2015).

Current State of the Problem

As per the FBI Uniform Crime Reports (2017), approximately 942,700 incidents of residential burglary occurred in 2017, making up 67% of all burglaries (1,401,840) and resulting in approximately $2,300 in property losses on average per incident. Furthermore, about 30% of these burglaries occurred during the nighttime and about 50% during the daytime. The remaining burglaries occurred in an unknown time and can be explained by the victim giving the broad time frame they were out of the home and the failure to determine an exact time of the incident. This could be represented by the victim leaving for several days and returning to a burgled home.

In comparison to the 2016 (1,054,470) and 2012 (1,567,058) estimates, the rate of residential burglaries has decreased by 12% and 60% respectively (FBI, 2017). However, the average financial losses in terms of the property of victims are still significant. Thus, continuing research on this subject is still warranted.

A guide from the Pop Center addresses residential burglary specifically, including all of the characteristics and behaviors that are involved (Weisel, 2002). This guide, however, solely addresses single-family home burglaries. Weisel's 2002 research first identifies relatively long time frames during which the crime occurs based upon the routine time ranges when homeowners are away, including mornings, afternoons, evenings, and nighttime. These time frames can be explained by homeowners being away at work, home for lunch, or out for nighttime activities. Crime prevention strategies can be developed through these time frames as well. For example, if residential burglaries are occurring during the school day and local schools are experiencing truancy issues, juveniles could be suspect (Weisel, 2002).

The offenders select targets generally based upon the opportunities for burglary, the potential risks, and the unique financial values (Weisel, 2002). For example, a house that has been previously burglarized, and the surrounding houses, experience the highest risk of being targeted as they most likely share the same characteristics that make them vulnerable, and the offender has familiarity with the area (Weisel, 2002). Additionally, a house that is secluded with little lighting, has several potential means of entry, contains no visible security devices or other forms of deterrence such as a dog, and looks to contain lucrative items (especially if they are easily viewable from the exterior of the home), provides an excellent target for a potential offender (Weisel, 2002). In terms of accessibility, homes that are in proximity to major thoroughfares or that reside on the perimeters of neighborhoods are vulnerable through greater exposure to potential offenders. This is amplified if the surrounding areas have high concentrated crime rates (Weisel, 2002). As for entry methods, Weisel's 2002 research shows a majority of burglars break into the home via forced entry with a small tool. Offender demographics for burglaries in 2017 derived from arrests include predominately white males, and 39% of the total arrested population (127,010) were offenders aged 25-39. The next section of this thesis establishes the theoretical foundations upon which this research is built and concludes with the proposal for the usage of an integrated theoretical model. An entire justification for an integrated theoretical model approach is included in an upcoming subsection; however, the essential logic is that through the combination of two theories that have been shown to coincide with and support each other in previous research (Chastain, Qiu, & Piquero, 2016), a stronger and more reliable explanation for residential burglary can be produced, contrary to an individual theoretical approach.

Chapter 3: Theoretical Foundations

The current thesis explains residential burglary through an integrated theoretical model, comprised of elements from social disorganization and opportunity theories. The following sections examine the historical development of the respective theories, identify the theories' core principles, and propose a subsequently integrated theoretical model coinciding with the rationale for its creation.

Social Disorganization Theory

Before the development of social disorganization theory, proposed criminological theories had not been formatted to explain crime beyond an individualistic, micro-level. In attempts to explain crime at a macro level, a new category of theories, deemed structural theories, were created that primarily examined both the conditions and structural characteristics of different communities (Akers & Sellers, 2013). These structural characteristics were first identified and empirically collected by Adolphe Quetelet and Andrew Guerry in the early 1800s in France. Their research challenged the classical teaching in criminology of free will (Akers & Sellers, 2013). Quetelet and Guerry argued that if a crime is solely based upon free will and is unaffected by other influences, then crime rates should appear in random distributions. However, Quetelet and Guerry identified correlations between crime and social characteristics like education, occupation, alcohol use, and poverty (Akers & Sellers, 2013). One of their more notable findings, contrary to their original predictions, was that juveniles were committing crime within their own neighborhoods instead of seeking opportunities in wealthier areas. These findings demonstrated the potential capacity of social characteristics influencing individuals to commit a crime and subsequently challenged the classic literature.

Beginning in the early 20th century, the term *social disorganization* was first used by W. I. Thomas and Florian Znaniecki in attempts to explain community-wide structural disorganization, after a surge of immigrants moved into Chicago in 1920 (Lanier, Henry, & Anastasia, 2015). Thomas and Znaniecki specifically defined social disorganization as "a decrease of the influence of existing social rules of behavior upon individual members of the group" (Whyte, 1943, p. 34). Later to be included in this term was a lack of community integrity and lasting community relationships, little surveillance, weak or no informal social controls, and ineffective communal organizations (Lanier et al., 2015). Modern elements of neighborhoods exemplifying these characteristics are discussed later.

Robert Park's 1925 *urban ecology* was an advancement of social theory in viewing a human society similarly to wildlife communities. Park asserted that a city physically grows based upon the following social processes: accommodation, dominance, and invasion (Lanier et al., 2015). Invasion can be explained by a different community, culture, or business moving into a city, taking resources away from existing structures, and subsequently destroying those community structures. Accommodation is the less extreme version of dominance and involves existing structures adjusting to newly established cultures or businesses. Lastly, dominance can be identified as a monopoly on a community structure. Additionally, Park asserted that a city's development did not occur randomly, but by the social processes mentioned above (Lanier et al., 2015). Park's theory would become the footpath for future colleagues to follow.

Noteworthy among them, Ernest W. Burgess advanced urban ecology by examining the physical expansions of cities and the resulting pressures placed on areas within the city (Lanier et al., 2015). Particularly, in 1925, Burgess created his concentric zone theory, which involved five distinct concentric rings–each of which contained different categories of citizens from the other,

as they expanded outward from the center of the city. Furthermore, these five zones were identified as representative of the different socioeconomic statuses of its inhabitants, and their borders were established as a result of Park's urban ecology elements. A notable limitation with this theory, however, was external validity in that perfect concentric rings cannot be identified, expanding from the center of every city.

Further advancing Park's and Burgess' theories, Clifford Shaw and Henry McKay conducted a study in Chicago that involved the examination of delinquent boys' residences in comparison with extensive community characteristics of their neighborhoods (Lanier et al., 2015). The results demonstrated that the juveniles' residences formed a pattern that correlated with various measurements including population change, poverty, mental illness, various adult crimes, and drug addiction (Akers & Sellers, 2013). Most notably, the researchers found that Burgess' zone in transition (zone II) experienced the highest rates of deviance and concentrations of socially disorganized qualities (Akers & Sellers, 2013). Shaw and McKay's work proved to be unique in itself, providing a key reference for future social disorganization studies.

Moving onto the 1960s, social ecology branched off into three separate disciplines: *urban design*, *critical ecology*, and *integrated ecology* (Lanier et al., 2015). The authors described the urban design as the physical structures themselves and how they influence crime. Next, they described critical ecology as the forces that manipulate the space that may become vulnerable to crime, such as economic forces. Lastly, the authors demonstrated integrated ecology as a theoretical approach that combines prior micro-level theories, with social ecology, in attempts to explain why crime occurs. These branches represent the movement of social ecology from broad terminology, to be associated with specific characteristics of a community.

Robert Sampson's 1989 *systemic informal social control* (which would permit collective efficacy's future establishment) and its associated elements are the final element in social disorganization's historical development. Essentially, collective efficacy is the capacity that residents within a neighborhood have to enact degrees of social control, and the critical mechanism within social disorganization's theory (Akers & Sellers, 2013). A subsection within collective efficacy, individual or self-efficacy, is the self-perceived ability an individual has to deal with an issue (Cullen, Agnew, & Wilcox, 2014). Without collective efficacy, there are no community ties or productive neighbor interactions to deter deviance. Subsequently, without self-efficacy, it would be challenging to establish collective efficacy internally. Policies and practical examples of each of the previously mentioned theoretical elements that form social disorganization are discussed in the next section.

Social Disorganization Theory in Current Discourse

The essence of social disorganization theory is still seen today via applications of the aforementioned social ecology, and collective efficacy theories. For instance, *crime prevention through environmental design* (CPTED) is a current practice that examines the urban design element featured in social ecology theory and is concerned with access control, territory characteristics and boundaries, overall maintenance of the territory, and natural surveillance (Lanier et al., 2015). Examples of potential CPTED characteristics that are observed from a physical location include the number of access points to the area for the public and subsequent possible escape routes, the defined boundaries of a business, the presence of trash on-site, and how easily viewed the area is by pedestrians (Lanier et al., 2015).

Critical ecology–concerned with external forces that make a physical area more susceptible to crime–includes public policing methods, community institutions, and local

government decisions (Lanier et al., 2015). For example, if a local government decides not to tear down and replace an abandoned structure with something beneficial to the community such as a garden or playground, the structure could facilitate deviance, and, subsequently, crime. This prong of social ecology is also concerned with informal controls, collective efficacy, and community policing (Lanier et al., 2015).

The third prong, integrated ecology, is demonstrated when, for example, determining the likelihood of a possible offender who (i) has learned through his deviant peers to engage in delinquency, and (ii) resides in a socially disorganized neighborhood carrying all three factors of routine activities. A tangent of this prong, systemic ecology, proposes that instead of a policy response being implemented in a socially disorganized neighborhood, efforts should be made to improve existing social capital (Lanier et al., 2015). Sampson's collective efficacy–a concept closely related to social capital–is concerned with citizen-level characteristics, including cohesion, incivilities, and informal social control (Lanier et al., 2015). The following theoretical section will address opportunity theory's history and development.

Opportunity Theory

Opportunity theory essentially indicates that individuals, when presented with the opportunity to commit a crime, will do so (Lanier et al., 2015). This theory's scope includes not only career criminals who actively seek the opportunity to commit a crime and have experience in doing so, but also traditional citizens who usually abide by the law. CPTED can reduce the opportunity for potential offenders, and C. Ray Jeffery first introduced this idea during social ecology's movement in the 1970s to account for structural and environmental characteristics in crime models centered around opportunity (Lanier et al., 2015).

CPTED is comprised of four essential sections: access control through the environment, natural surveillance available, the territory's characteristics and boundaries, and overall maintenance of the territory (Lanier et al., 2015). Access control through the environment involves the physical access of a location to the public. Multiple access points could create multiple opportunities for potential crime; therefore, minimizing these points creates fewer entrance and escape routes (Lanier et al., 2015). Natural surveillance involves the capacity for the location to be physically observed without the assistance of technology (Lanier et al., 2015). A territory's characteristics and boundaries include features that define the extent to which the territory reaches and unique aspects of the territory itself (Lanier et al., 2015). Lastly, overall maintenance of the territory involves the aesthetic appearance of the area and the impression that the public routinely accesses it (Lanier et al., 2015). However, this thesis's research design does not include or measure degrees of CPTED. This element of opportunity theory is more of a potential inference to explain residential burglary during the *discussion* section. As CPTED applies to opportunity theory, consider residential burglary. A single-family home that is burgled most likely shares similar characteristics with other residences in the neighborhood. If it were determined that the original residence's CPTED (or lack thereof) allowed the burglary, it might be articulated that other residences in the neighborhood are at similar risk for burglary.

The following section explains the integrated theoretical framework while addressing potentially similar theories and identifying their differences. In addition to determining what operationalized variables (Figure 1) of both respective theories have the most significant relationship with residential burglary, this thesis's experiment will test and determine if this particular theoretical framework is successful and if so, to what degree. From a theoretical

standpoint, this framework should yield exponential findings and provide a more detailed explanation for residential burglaries than prior research has produced.

Building the Case for an Integrated Theoretical Model

The integrated theoretical model for this thesis combines both social disorganization and opportunity theories in attempting to provide a stronger, more reliable explanation for residential burglary. Both of these theories have empirical support, as examined in the following *review of the research literature* section, and demonstrated positive relationships with residential burglary. However, no research to date has been structured around an integrated theoretical explanation of these two theories, for residential burglary of single-family homes.

Researchers (Chastain et al., 2016) created a simulation model through an Analytic Hierarchy Process, which utilized all the respective components of routine activities, social disorganization, and journey to crime theories, and found support for (i) these theories' ability to coincide with and support each other, and (ii) the operationalized variables' relationships with offender-based residential burglary data in Dallas, Texas.

From social disorganization, social ecology's first two legs, urban design and critical ecology (Lanier et al., 2015), are chosen. These two legs represent both the physical state of a neighborhood and the socioeconomic characteristics required to explain residential burglary. The third leg, integrated ecology, is the literal purpose of this integrated theoretical model and would, therefore, be redundant to include. Measures of collective efficacy are not collected for this experiment through a Likert scale survey given to residences (Cancino, 2003; Yuan & McNeeley, 2017), nor through residential instability measures such as duration of residence and number of rented homes (Roth, 2018). The creation of this integrated theoretical model was partly in compensation for the lack of traditional measures for social disorganization. Since this

theoretical framework lacks social disorganization's elements of collective efficacy and residential instability, elements from opportunity theory were added to strengthen the framework.

Cornish and Clarke's 1986 study of rational choice asserted that offenders go through stages of decisions before, during, and after committing a crime (Cullen & Wilcox, 2010). Particular to burglary, they argued an offender who knows of a particular neighborhood's risk to burglary would target that neighborhood if the risk is deemed favorable (e.g., the opportunity for rewards outweighs the inherent risks). Moreover, "because Clarke and Cornish believe that crime specific is essential…there are differences between residential burglary in a middle-class suburb…and in a lower-class or upper-class neighborhood" (Cullen & Wilcox, 2010, p. 217). Other factors that could influence the perceived opportunity by potential offenders include an offender's knowledge of previously burgled residences in a neighborhood, and exposure of the neighborhood to the offender via an access highway. These instances also draw from the multi-contextual opportunity theory provided by Wilcox, Land, and Hunt, which maintains that a burglary victim's risk is not exclusively affected by their routine activity or type of lifestyle; rather, it is also impacted by "the aggregate-level of opportunity of the neighborhood in which the individual resides" (Cullen & Wilcox, 2010, p. 1009). In short, the macro-level opportunity for burglary inherent in the neighborhood itself contributes to the overall risk for individual residential burglary. The variables of *proximity to access highway*, *proximity to previous burglary*, and *housing density* were selected to represent opportunity theory based on their overall reliability and relationships with residential burglary in previous research. Moreover, Shaw and Mckay's social disorganization "theoretical framework is consistent with the idea that urban communities have a decreased capacity for social control, compared with suburban and

rural areas. In particular, urbanization may weaken local kinship and friend-ship networks and impede social participation in local affairs" (Sampson & Groves, 1989, p. 781-782). This translates to areas with denser levels of homes (urbanization) being at risk for increased social disorganization, and strengthens the justification for including an opportunity-based variable of *housing density* integrated into measures of social disorganization.

Notably, rational choice theory, along with Cohen and Felson's routine activities theories, are similar to opportunity theory. However, in light of the *victim-centric* nature of the dataset available for this thesis, these additional frameworks were not considered (see Methodology). This research design does not contain offender-based data, which would include age, sex, income (Akers & Sellers, 2013), criminal history, daily travel patterns, or employment and residential locations (Chastain et al., 2016). Guardianship, being formal levels via police patrols or CCTV security cameras, and informal levels such as CPTED variables or collective efficacy degrees, are not included within this research design either. Suitable targets (single-family homes) are not observed and collected in a qualitative data design, which would allow for determining unique characteristics of residences that could make the single-family home more favorable for motivated offenders. *Proximity of access highway* could also be misinterpreted as a RAT variable; however, with the lack of offender-based data, which could identify a particular access highway as a routinely traversed route, this variable serves as a means of potential exposure and escape after the burglary has been completed, to individuals who might view that neighborhood as a unique opportunity. This variable is based on a theoretical rationale and one study in Jacksonville, Florida, which found a positive relationship with distance to major highway and residential burglary (Nobles, Ward, & Tillyer, 2016).

Consistent with similar variables available in the data for this thesis, a study in Jacksonville, Florida included *population density*, *proximity to access highways* and near-repeat burglaries among variables operationalized (Nobles et al., 2016). Overall, positive correlations were found between these two variables and the near-repeat, repeat-, and single-event burglaries measured. A logical inference from these findings, and a key premise for this thesis's main argument, is that neighborhoods with a higher population density are typically closer to access highways due in part to the physical size and resource demands of such neighborhoods. Furthermore, this study included measures of concentrated disadvantages and residential instability (such as poverty, unemployment, racial heterogeneity) and similarly found positive relationships with all three types of residential burglary (Nobles et al., 2016). While somewhat similar, the literature and framework for the study in Jacksonville focused on social ecology and neighborhood-level characteristics, while failing to address the potential role opportunity theory has. Figure 1 illustrates the subsequent operationalization of the respective theories' elements as they will be examined and justified in the following section of the literature review.

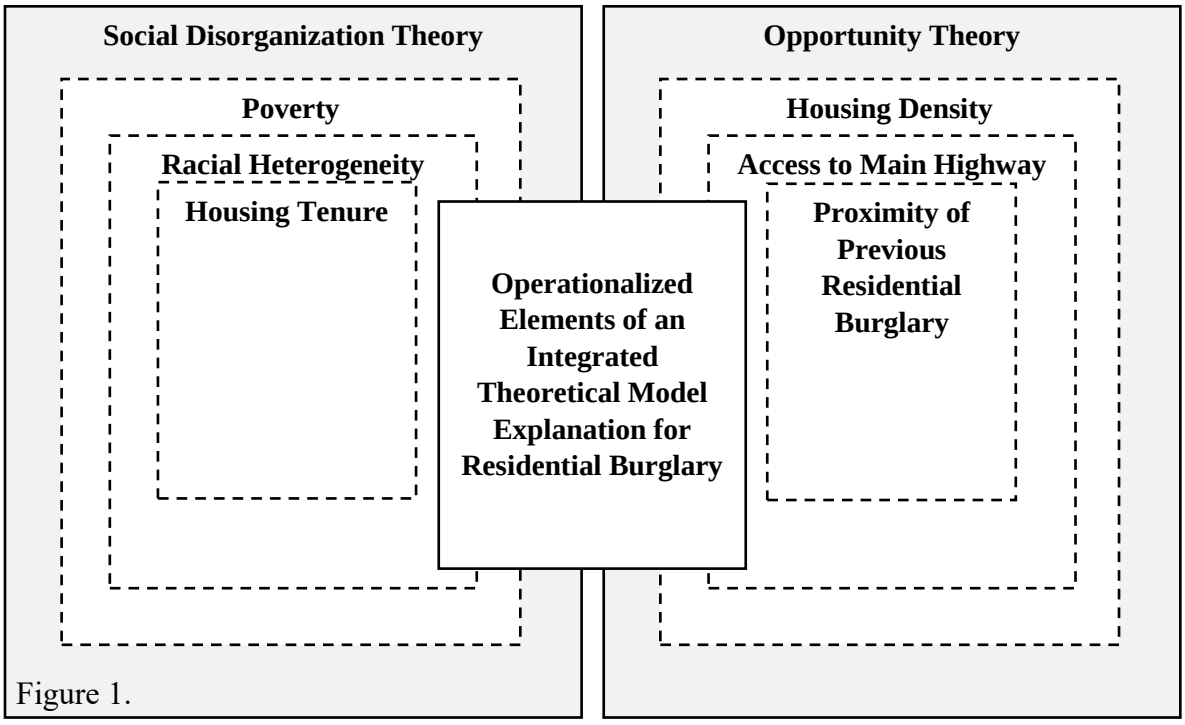

Figure 1.

Chapter 4: Review of the Research Literature

The following is a review of existing research that has examined residential burglary of single-family homes and its relationship with elements from both opportunity and social disorganization theories. Doing so will identify variables from the studies that represent the respective theories' elements and, subsequently, the variables chosen to be included in this thesis. Overall, research has found support for both theoretical explanations of residential burglary's occurrence and evidence for the distinct variables' relationships with the crime.

Social Disorganization Theory Variables

Poverty

Poverty is perhaps one of the most frequently associated variables with social disorganization theory as an explanation for crime. The logical argument is that neighborhoods experiencing increased levels of poverty are more likely to become victimized through crime as there will be fewer forms of security and higher levels of potentially motivated offenders (Nobles et al., 2016). Multiple prior studies have found significant positive relationships with residential burglary and levels of poverty (Chamberlain & Boggess, 2016; Groff & Vigne, 2001; Zhang & Song, 2014). Poverty has also been found to have a stronger relationship with residential burglary than measures of residential instability, including housing tenure and the number of rental homes (Zhang & Song, 2014). Conversely, a study (Mburu & Bakillah, 2016) found that burglary risk was reduced within areas of dense public housing and a high populous. This finding could be interpreted as burglars acknowledging an area of distinctive disadvantages but with potentially high levels of collective efficacy, and ultimately seeking a more vulnerable and profitable target elsewhere (Mburu & Bakillah, 2016). However, in combination with education

and level of housing (government-aided or not), poverty was found to be positively associated with residential burglary (Quick, Li, & Brunton-Smith, 2018).

Housing Tenure

Housing tenure is defined as whether the current occupant of a single-family household is renting the residence or owns the residence (United States Census Bureau, 2019). The latter includes if the homeowner is currently paying a mortgage as well. Drawing from social disorganization theory and per this thesis's unit of analysis, block groups that contain more single-family homes that are being rented by the occupants are expected to experience more burglary compared to block groups that contain more single-family homes that are owned. Previous research has found significant, positive relationships with this measurement of residential instability, and it is hypothesized that this thesis will yield similar findings (Nobles et al., 2016; Zhang & Song, 2014).

Racial Heterogeneity

The final element of social disorganization for this integrated theoretical model, racial heterogeneity, is based upon the level of racial diversity in a neighborhood (Cullen & Wilcox, 2010). Theoretically, when viewing "communities with diverse racial groups living in close proximity, interaction between members will be low, or at least lower than in racially homogeneous neighborhoods" (Kubrin, 2000, p. 195). This would result in reduced informal controls as "heterogeneity can undermine ties between neighbors, limiting their ability to agree on a common set of values" (Kubrin, 2000, p. 195). These reduced informal social controls are not directly due to the specific race of a neighborhood, but rather, the neighborhood composition showing low levels of homogeneity and therefore, conflicting interests and bonds within the neighborhood. Lastly, "neighborhood levels of informal social control can be influenced by

changes in neighborhood ecological structures, such as a change in the racial composition of the population" (Kubrin, 2000, p. 196). This would appear as higher homogeneity of a neighborhood, correlating with increased levels of informal controls and therefore a reduction of crime.

Empirical findings in-line with the theoretical idea of racial heterogeneity would appear as the higher the value of heterogeneity equating to a more significant degree of neighborhood disorganization. Independently, racial heterogeneity had one of the most robust positive relationships with residential burglary and significantly contributed to the overall 84% explanation of burglary in The Hauge, The Netherlands (Bernasco & Luykx, 2003). Racial heterogeneity, in combination with single-parent households and poverty, was found to have a positive relationship with residential burglary (Zhang & Song, 2014) in Louisville, Kentucky. Additionally, these variables, in combination, explained more of and had a stronger relationship with residential burglary by explaining 83% of block groups (556) compared to residential instability measures (Zhang & Song, 2014). Furthermore, in Jacksonville, Florida, multiple variables were found to have a significantly positive relationship with residential burglary, including racial heterogeneity, which increased the near-repeat risk of burglary by up to 55% (Nobles et al., 2016). This finding, in particular, demonstrates this variable's ability to coincide with the *proximity of previous residential burglary*, explained later on, and will aid in strengthening the predictions for burglary location. Racial heterogeneity has also been found to have a positive relationship with residential burglary, with nearly two times the increased risk (Quick et al., 2018), along with robbery, vehicle, and violent crimes. Overall, this variable has been shown to, in combination with other social disorganization elements, actively contribute to the explanation of residential burglary.

Opportunity Theory Variables

Housing Density

Housing density is measured as the number of single-family homes within a block group. Drawing from opportunity theory, a block group with a higher density of homes should represent a greater opportunity for burglary, compared to block groups with lower density. Results from ordinary least squares regression (OLS) models in Louisville, Kentucky showed significant positive relationships with the number of housing units and residential burglary (Zhang & Song, 2014). While other studies have examined population density and found negative correlations with residential burglary, this research is concerned with residential-based victimization, and therefore, citizen populations are not appropriate (Chastain & Piquero, 2016; Nobles et al., 2016). Additionally, since the dependent variable is solely concerned with single-family homes, controlling for population density could skew the results. For example, it is expected that an apartment complex or similar form of residence will contain a more substantial population density than a neighborhood of single-family homes.

Proximity of an Access Highway

Based on Weisel's 2002 research and in terms of accessibility, homes that are in proximity to major thoroughfares or that reside on the perimeters of neighborhoods are vulnerable through greater exposure to potential offenders. Prior studies have examined factors that may increase the risk for potentially motivated offenders to engage in residential burglaries, such as their own residences' distance from the target (Bernasco & Luykx, 2003; Chastain et al., 2016). Additionally, studies have found relationships with social disorganization and lack of guardianships, increasing the risk of residential burglary from nonlocal pedestrians and drivers on streets (Frith, Johnson, & Fry, 2017). However, little research exists on the potential effect

that the proximity of an access highway to a residence may have on burglary, except for a 2016 study in Jacksonville, Florida (Nobles et al., 2016). From a theoretical argument, there are mostly two justifications for this variable's influence. Firstly, the closer in physical distance that a residence is to an access highway, the more potential there is for that residence to be exposed to both (i) strangers who are not from the area that could view the neighborhood as opportunistic for burglary and (ii) the volume of potential offenders that traverse a broad road such as a highway, which amplifies the risk exposure to an offender. The second justification is that after the commencement of residential burglary, the offender will have a higher probability of fleeing the area through access to a highway. The physical proximity required of a major highway to affect residential burglary has not yet been established. The only obtained study that analyzed the direct effects of highway proximity utilized a 1,000-foot buffer from highways to residences (Nobles et al., 2016) and found a significantly positive relationship with burglary at a 27% risk increase.

Proximity of Previous Residential Burglary

From an opportunity theoretical approach in explaining residential burglary, residences within a certain proximity may experience a higher risk of burglary due to sharing similar physical characteristics of the building itself, including CPTED elements (or lack thereof) (Hodgkinson & Andresen, 2019; Johnson et al., 2007), the proximity of the offender's residence to the target location (Bernasco & Luykx, 2003; Chastain et al., 2016; Groff & La Vigne, 2001), or the individual perceptions of offenders and their knowledge of previous targets (Chamberlain & Boggess, 2016). Social disorganization characteristics have also been found to have significant positive relationships with the initiator and near-repeat residential burglaries (Piza & Carter, 2018). Regardless of the specific reasoning, previous research has found evidence in support of

this variable. The exact distance and degree of risk for surrounding residences in becoming targets also remain uncertain. Previous risk findings in which a future burglary may occur based upon a previous event have been found to range from 200 meters for up to eight weeks of increased risk (Johnson et al., 2007), 1 square kilometer with 16 times more likelihood of burglary for two days (Bernasco, Johnson, & Ruiter, 2015), one block for one week with 320% increased risk (Nobles, Ward, & Tillyer, 2016), and 3 square blocks with up to 33% increased risk for four days (Piza & Carter, 2018).

Chapter 5: Research Question and Hypothesis

The following is the research question and the subsequent hypothesis tested for this thesis. They are based upon the previously examined research of the variables and from the theoretical framework. This section also contains the introduction of and explanation for the rate variable used in the experiment, being per 1,000 single-family homes.

Rate Variable

In the interest of contributing to this study's external validity and ability to apply the results towards other future experiments, a rate variable is established. As the target area of residential burglary is focused solely on single-family homes, the rate variable created is residential burglary per 1,000 single-family homes and represents the unit of analysis. This particular value was created to provide the possibility to calculate a ratio of residential burglary spread across study areas, which vary in single-family home populations. Secondarily, this value is utilized for convenience as a numerical value, which is comprehensible and relatively easy to manage statistically.

Unit of Analysis

The unit of analysis for this thesis is block groups and, therefore, *burglary incidents per block group.* Block group-level data was specifically chosen as the level of measurement as this

is the most accurate and conducive for the operationalized variables. Compared to census tracts, "block groups permit a more detailed perusal of the spatial patterns of crime within an urban community while socio-demographic data are readily available from the census" (Zhang & Song, 2014, p. 92).

Research Question 1

Can residential burglaries in Dallas neighborhoods be better explained using an integrated model (consisting of social disorganization and opportunity measures) than either model independently? The null hypothesis is *H0: There is no model improvement when social disorganization and opportunity variables are introduced into a multivariate model of residential burglary*. Making the alternative hypothesis *H1: A multivariate model of residential burglary is stronger (more variance explained) when composed of social disorganization and opportunity variables versus an independent model of either construct, respectively.*

Chapter 6: Methodology

Data

Data utilized for this study is derived from two primary sources. Geolocated incident data reports compiled of all known incidents to police which occurred in the city of Dallas, Texas, from 2014-2019, were obtained through Police Data Initiative (Police Data Initiative, 2017) and Dallas Open Data (Dallas Open Data, 2019) provided by Dallas City Police Department (DCPD). American Community Survey 5-year estimates from 2017, block group level data, is used for all the variables of interest in this study, except *poverty*, which is from 2016, and is obtained from the Census Bureau (United States Census Bureau, 2019). Lastly, TIGER/Line Shapefiles (United States Census Bureau, 2019) at a block group level provides the environmental backcloth layers. The study site, Dallas, Texas, is the third-largest city in Texas by population with approximately 1,345,000 residents, as of 2018 (United States Census Bureau,

2019). Additionally, Dallas is approximately 385 square miles, with a population density estimate of 3,517 per square mile as of 2010 (United States Census Bureau, 2019). The following *Methodology* process is illustrated below in Figure 2.

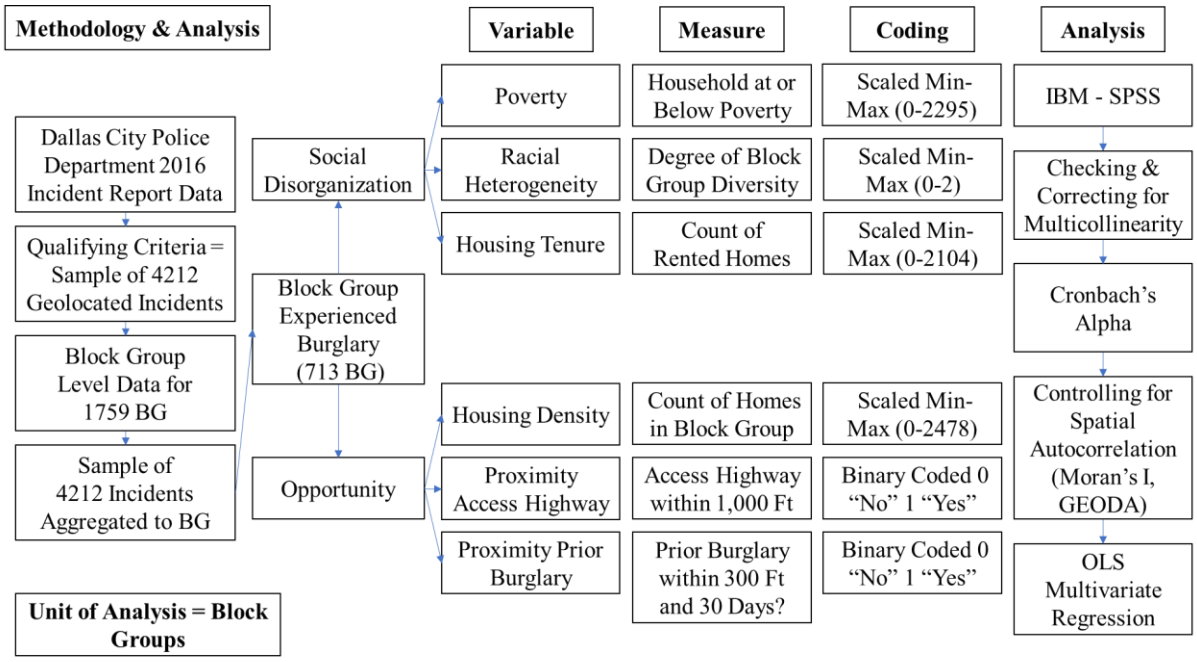

Figure 2.

Dependent Variables

The city of Dallas, Texas, experienced 8,347 total reported residential burglary incidents in 2016. From this data set, qualifying criteria was applied to filter out the desired sample. The criteria included that (i) the residential burglary incident be reported under the Uniform Crime Report's definition of burglary of a residence, (ii) the *type of location* described by DCPD must be either Single-Family Household-Occupied or Single-Family Household-Vacant, and (iii) the incident of *date one* and *date two* as reported by DCPD must fall between the time range of January 01, 2016, 00:01 hours and December 31, 2016, 23:59 hours. These time-range values were chosen as they would provide a sufficient sample size of incidents to perform ordinary least squares multivariate regression (OLS) and to eliminate residential burglaries of single-family

homes that may have occurred in a year other than 2016. The resulting sample is 4,407 incidents of single-family household residential burglary occurring in the city of Dallas, Texas, in 2016.

Independent Variables

The majority of the independent variables draw heavily from the same study in Jacksonville, Florida (Nobles et al., 2016), and was done so for several reasons. Firstly, using previously operationalized variables' measures, which produced positive relationships with residential burglary, contributes to both types of validity for this thesis's research design. Additionally, the census data sources obtained from the study in Jacksonville are the same sources for this research design.

Poverty is measured as "including [the] proportion of households under the federally defined poverty level" (Nobles et al., 2016, p. 719) by income, and appears as the count of households per block group, which fit the definition. This variable's data is from the American Community Survey 5-year estimates from 2016 (United States Census Bureau, 2019). Data from 2017 was unavailable for this variable. *Housing tenure* is represented as the count of rented homes per block group. *Racial heterogeneity* "indicates the degree to which a block group is racially diverse. It was calculated using the formula ($1—\sum p_i^2$) where pi denotes the proportion of each racial group; higher scores indicate greater neighborhood racial heterogeneity" (Nobles et al., 2016, p. 719). This formula is based on a prior study (Kubrin, 2000), which examined social ecology variables, crime, and racial heterogeneity. The written formula appears as "1 – [(prop. African-American)^2 + (prop. Asian)^2 + (prop. Caucasian)^2 + (prop. Hispanic)^2 + (prop. Native American)^2]" (Kubrin, 2000, p. 197) and is calculated in Microsoft Excel.

Housing density is represented as the count of homes per block group. *Housing density* and the two variables of social disorganization above are coded on low-high value scales with

"0" representing the lowest (i.e., least dense, lowest levels of poverty and housing tenure, no racial diversity) and the largest values representing the highest of these measures. Block groups that have higher values represent greater levels of social disorganization and opportunity for burglary. The *proximity of an access highway* to a residence "is a dichotomous indicator created using ArcGIS's buffer tool to represent whether any part of the block group is located within 1,000 feet of a major highway" (Nobles et al., 2016, p. 720). Highways are identified and defined by the shapefile obtained through TIGER/line as "primary roads," and the measurement of this variable is binary, where "0" = "No" and "1" = "Yes." These access highways include state highways, turnpikes, and national interstates.

The *proximity of previous residential burglary* is also "a dichotomous indicator created using ArcGIS's buffer tool" (Nobles et al., 2016, p. 720) set to one block (300 feet) and 30 days. This variable is also measured as a binary variable, "0" = "No" and "1" = "Yes," and is obtained through the comparison to the prior 30 days of burglaries. This means that the buffer tool is set around all single-family home residential burglaries during the first 30 days of 2016 and compared to the next 30 days of 2016. If a known burglary that occurred in the first 30 days was shown within one block by the buffer tool to a burglary in the second set, that block group that experienced the burglary is coded as a "1." This methodology is continued for every 30 days for the calendar year, resulting in 11 feature classes of previous burglaries. The one-block distance measurement was chosen as prior studies have used city blocks and found positive relationships with residential burglary (Bernasco et al., 2015; Johnson et al., 2007; Nobles et al., 2016; Bernasco et al., 2015; Piza & Carter, 2018). The exact distance of 300 feet was chosen as previous research determined their one block measurement as using the average length of all block groups within the study site, which was shown as 575 feet in Jacksonville, Florida (Nobles

et al., 2016). Dallas's average block group length is approximately 250 feet. This number was rounded to the 300 feet parameter used for the analysis. These parameters of measurement for both time and distance were chosen for convenience and simplicity, as this research design does not require time-distance decay, complex spatiotemporal analysis, or near-repeat calculations. While somewhat similar to prior research (Nobles et al., 2016), the research design for this thesis uses the *proximity of a previous burglary* as a binary independent variable and does not include more variables for concentrated disadvantage, residential instability, and family disruption. With the nature of this data and research design, it is necessary to account for the potential of spatial autocorrelation and its effects on the results. Therefore, a control variable is created deemed *burglary lag.* Mainly, if high rates of burglary are found within one block group, high spatial autocorrelation is expected to be found in neighboring block groups through high rates of burglary.

Analytical Strategy

There were multiple steps required in the analytic process for this research design. First, feature layers for the environmental backcloth of Dallas, Texas, were created, and all incident addresses from the 2016 data set were geocoded using Dallas's Streets shapefile. Once the highest number possible of addresses had been successfully geocoded, block group data from the U.S. Census Bureau, which included TIGER shapefiles, were added to the map as feature layers, representing the remaining environmental backcloth variables and neighborhood-level characteristics/demographics. After geocoding and matching 95% of the 4407-incident sample, a total of 4204 incidents were available for the analysis (shown in Figure 3). The incidents were then aggregated to a block group level, resulting in 713 block groups that experienced a burglary. Next, spatial autocorrelation, as measured via Moran's I, was performed to determine the degree

of contiguity between block groups with respect to burglary incidents. To account for any autocorrelation detected, a variable to represent spatial lag–*burglary lag*–was created and incorporated into the hypothesized model.

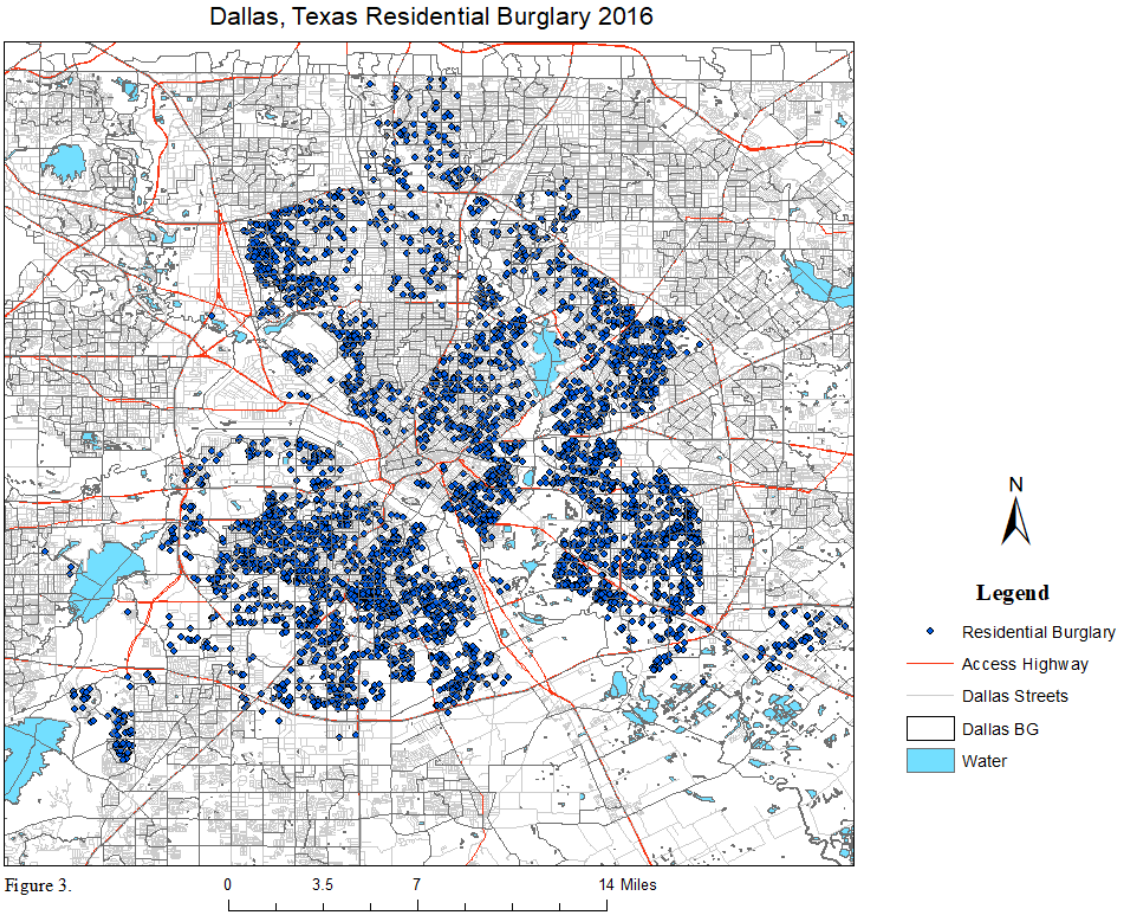

Figure 3.

Proximity of previous residential burglary was obtained by (i) creating feature classes of block groups that experienced a burglary, (ii) creating a 30-day, one block buffer around those block groups using ArcGIS's buffer tool, and (iii) counting nearby block groups that experienced burglary within those parameters as near-repeats and creating feature classes from those results. Figure 4 provides an example of block groups that fit the above criteria for a near-repeat burglary and were binary coded as "1."

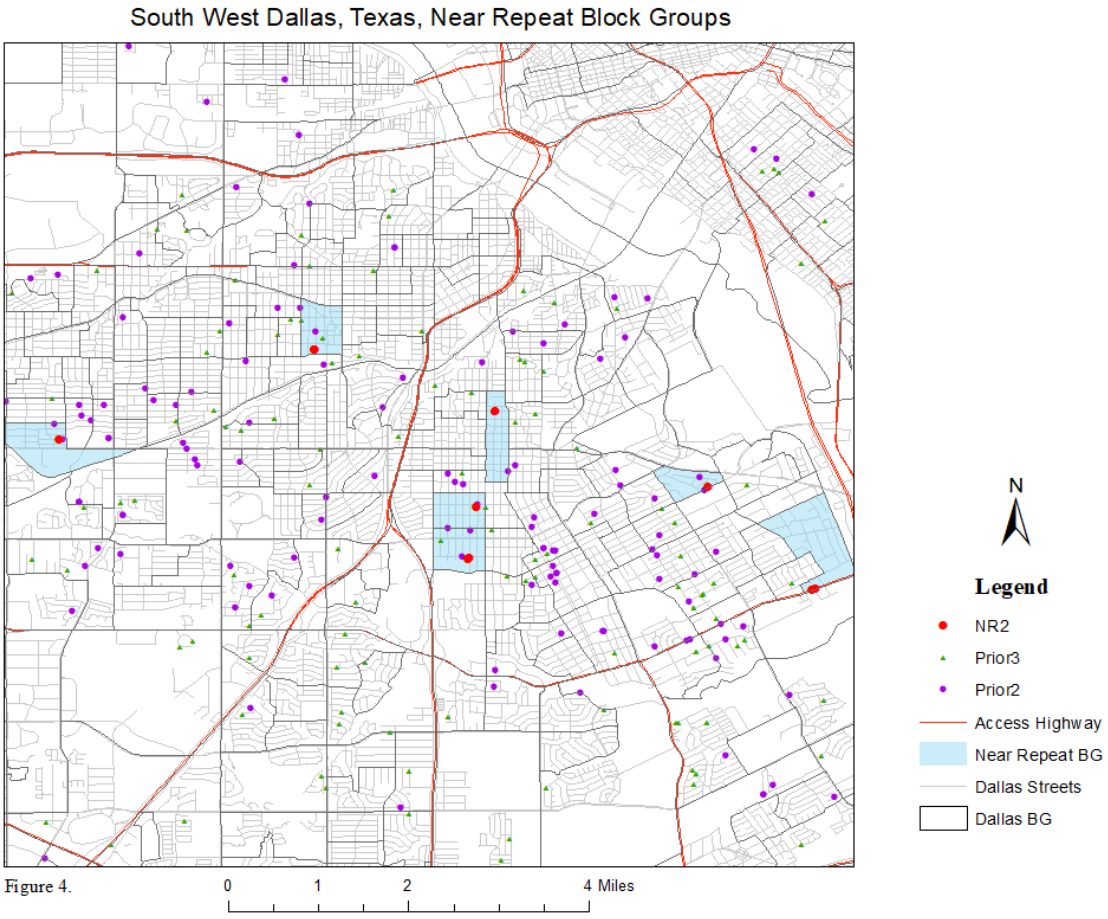

Figure 4.

Similarly, to determine if block groups were within 1,000 feet of an *access* highway, ArcGIS's buffer tool was used to create a feature class that identified block groups that met this parameter. Figure 5 illustrates all Dallas block groups that were found to be within 1,000 feet of an access highway.

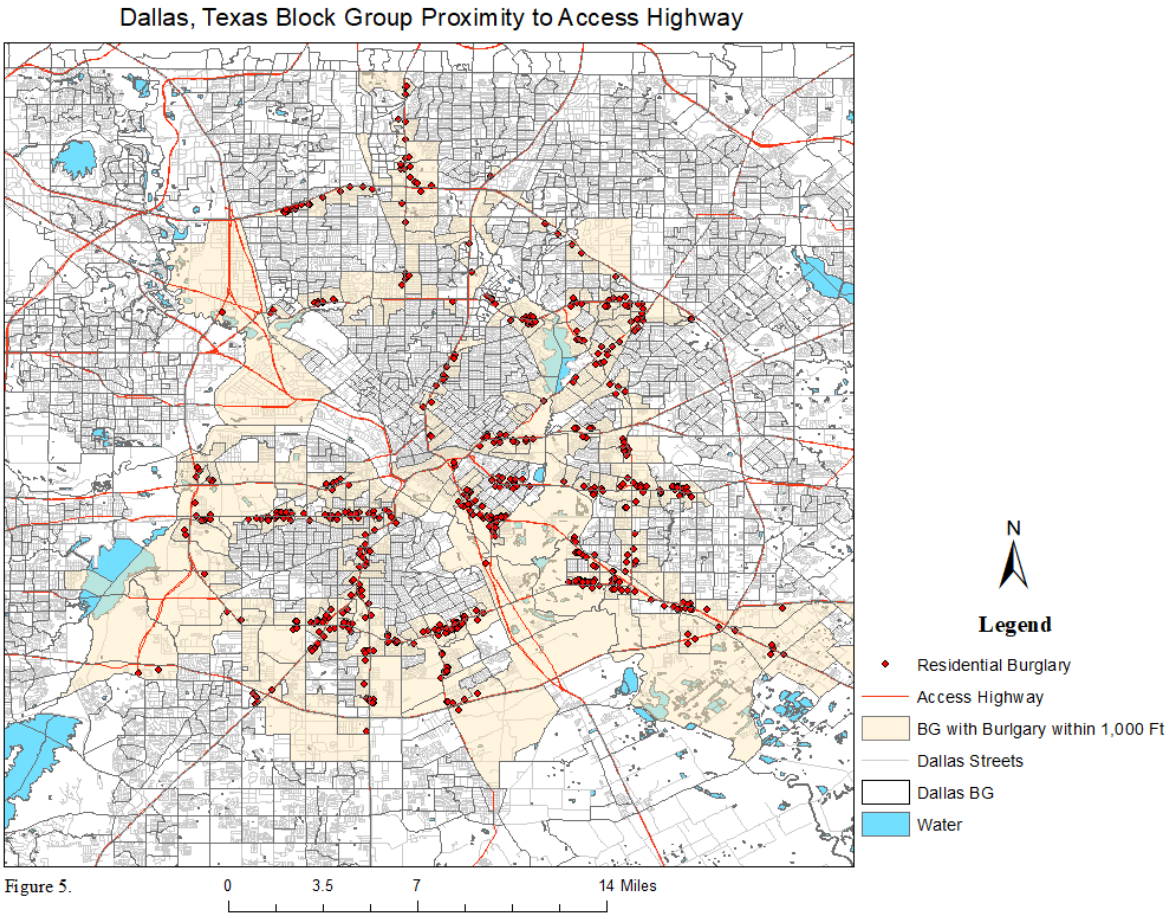

Figure 5.

The data for both of the previously mentioned opportunity variables was then exported to Microsoft Excel and matched to the block groups with the remaining variables. After all the variables were calculated for each block group, including the burglary count per block group, the data file was exported to IBM SPSS for analysis. Initial descriptive statistics (i.e., central tendency measures, dispersion) for the block groups were calculated. Next, factor analysis and reliability testing were performed for the social disorganization and opportunity variables, to determine the viability of uniform constructs for each concept. Tests for multicollinearity were also performed during this phase, with the idea that evidence of such could be corrected by combining collinear variables into aggregate constructs. While there was some evidence of

collinearity (see Tables 2 and 3), it was not deemed strong enough to warrant aggregating the variables further into uniform indices.

Finally, OLS multivariate regression was used to measure the strength and statistical significance of each derived model on burglary counts within block groups. The four models derived were: (1) social disorganization, (2) opportunity, (3) the integrated model (social disorganization and opportunity together), and (4) the integrated model with spatial lag accounted for.

Chapter 7: Results

Descriptive Statistics

Table 1. Summary Data for Variables

Values	Mean	Median	Mode	Std. Deviation	Skewness	Kurtosis
Dependent Variable						
Burglary Count	5.91	4	1	5.43	1.96	4.94
Independent Variables						
Soc. Dis.						
Race Het. Index	1.22	1.39	1.5	0.54	-0.71	-0.69
Poverty Count	521.42	459	339	269	1.64	4.35
Tenure Rent Count	273.93	172	0	287.1	1.99	4.99
Opp.						
Housing Count	586.93	507	414	311.47	1.77	4.88
BG within 1000Ft	0.42	0	0	0.49	0.35	-1.87
Prior Burglary	0.19	0	0	0.39	1.6	0.56

Initial summary data, shown above in Table 1, described the data for all variables included in the analysis. Dallas block groups contained, on average, 587 homes, 274 renter-occupied homes, 521 individuals at or below the poverty line, and six burglaries for 2016. The average block group diversity of 1.22 indicated that block groups are approximately 60% heterogeneous, as the values ranged from 0 to 2. Regarding the opportunity variables, 42% of

block groups were found to be within 1,000 feet of an access highway, while 19% experienced a previous burglary within 30 days and 300 feet of another block group. All variables are positively skewed and with a leptokurtic distribution in kurtosis (excluding race het. index and block group within 1000 feet).

Factor Analysis and Bivariate Correlations

Table 2. Bivariate Correlations from Factor Analysis – Social Disorganization Theory

Correlation	Tenure Rent Count	Poverty Count	Race Het. Index
Tenure Rent Count	1.00	.803	.083
Poverty Count	.803	1.00	-.10
Race Het. Index	.083	-.10	1.00

Table 2 shows the correlation matrices for disorganization's three variables. Overall, all variables were significant $p < .05$ and correlated with each other, but to considerably different magnitudes.

Table 3. Bivariate Correlations from Factor Analysis – Opportunity Theory

Correlation	Housing Count	BG within 1000Ft	Prior Burglary
Housing Count	1	.14	.062
BG within 1000Ft	.14	1	.09
Prior Burglary	.062	.09	1

Table 3 shows the correlation matrices for opportunity theory's three variables. Overall, all variables were significant $p < .05$ and positively correlated with each other. However, the variables are more consistent in their (weak) correlations compared to social disorganization variables.

Cronbach's Alpha

Table 4. Model 1, 2, 3 & 4 Cronbach Alpha

Values	Cronbach's Alpha	Based on Standardized Items	N of Items	Sig.
Model 1	0.667	0.515	3	0.000
Model 2	0.001	0.245	3	0.492
Model 3	0.593	0.452	4	0.000
Model 4	0.554	0.417	5	0.000

Cronbach's alpha was calculated for all three models, and the results are displayed in Table 4. Overall, the social disorganization model (model 1) yielded the most substantial score of .667 and significance of $p < .001$. Model 2, the opportunity model, yielded only a score of .001 and was found to be insignificant. Model 3 provided promising results with a score of .593 and a significance of $p < .001$. Lastly, model 4 includes all independent variables, and the *burglary lag* variable, and produced a score of .554 at a significance of $p < .001$. Ultimately, a reading of .667 for the social disorganization variables and .001 for the opportunity variables means that there was some evidence of uniformity among social disorganization measures, but none for opportunity measures. Additionally, there were some considerable fluctuations in correlation magnitude with the social disorganization variables, thus warranting a more cautious approach in the analysis by simply leaving the variables as is versus trying to create any composite variables. After discovering the lone statistical significance of *prior burglary* in model 2, the original idea of a multivariate model for opportunity theory was abandoned and only *prior burglary* was implemented in the later integrated models.

Moran's I & Spatial Autocorrelation

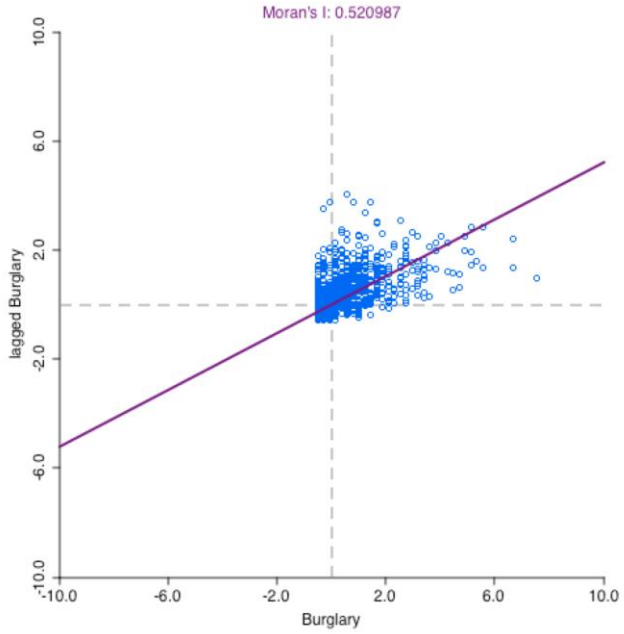

Figure 6.

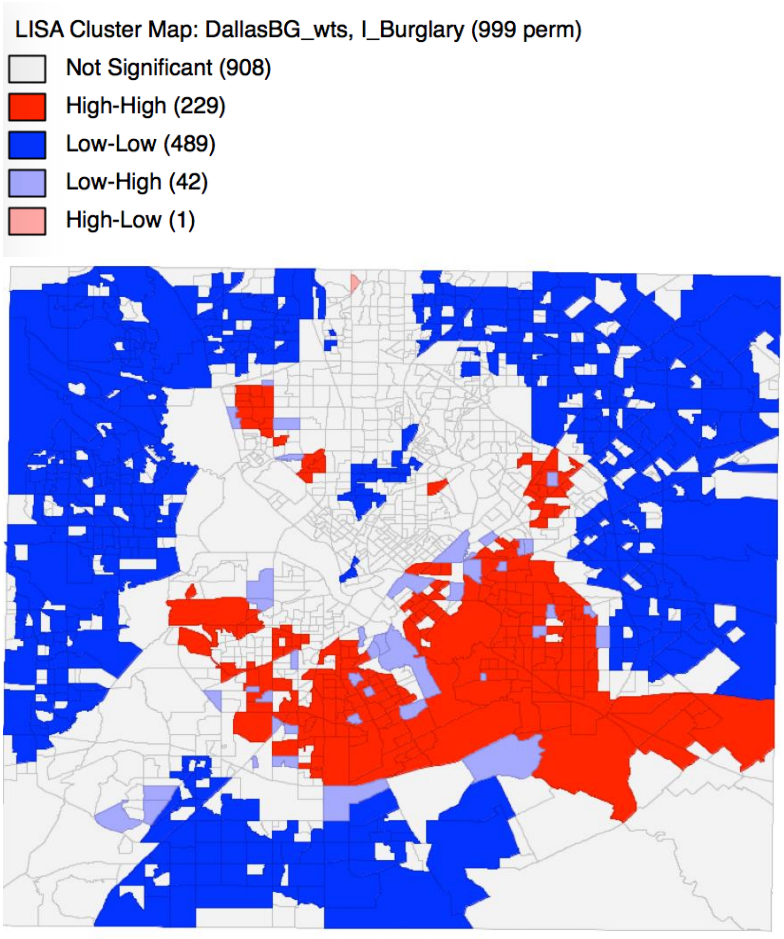

Figure 7.

Figure 6 shows spatial autocorrelation estimates for Dallas burglaries (Moran's I = .512; p = .001), and Figure 7 illustrates mapping of local spatial autocorrelation indicators. This means there is considerable contiguity between Dallas block groups regarding burglary. Block groups that experienced high levels of burglary tend to reside adjacent to block groups with similar levels of burglary (most notably in the south/southeast sections of the city). However, the outskirts of Dallas County demonstrated block groups with low levels of burglary being adjacent to other block groups with similarly low levels of burglary. Therefore, burglary is not randomly distributed, but rather, demonstrates a spatial bias that must be accounted for in efforts to model burglary. A choropleth map (Figure 8) illustrates the count of burglaries per block group for Dallas.

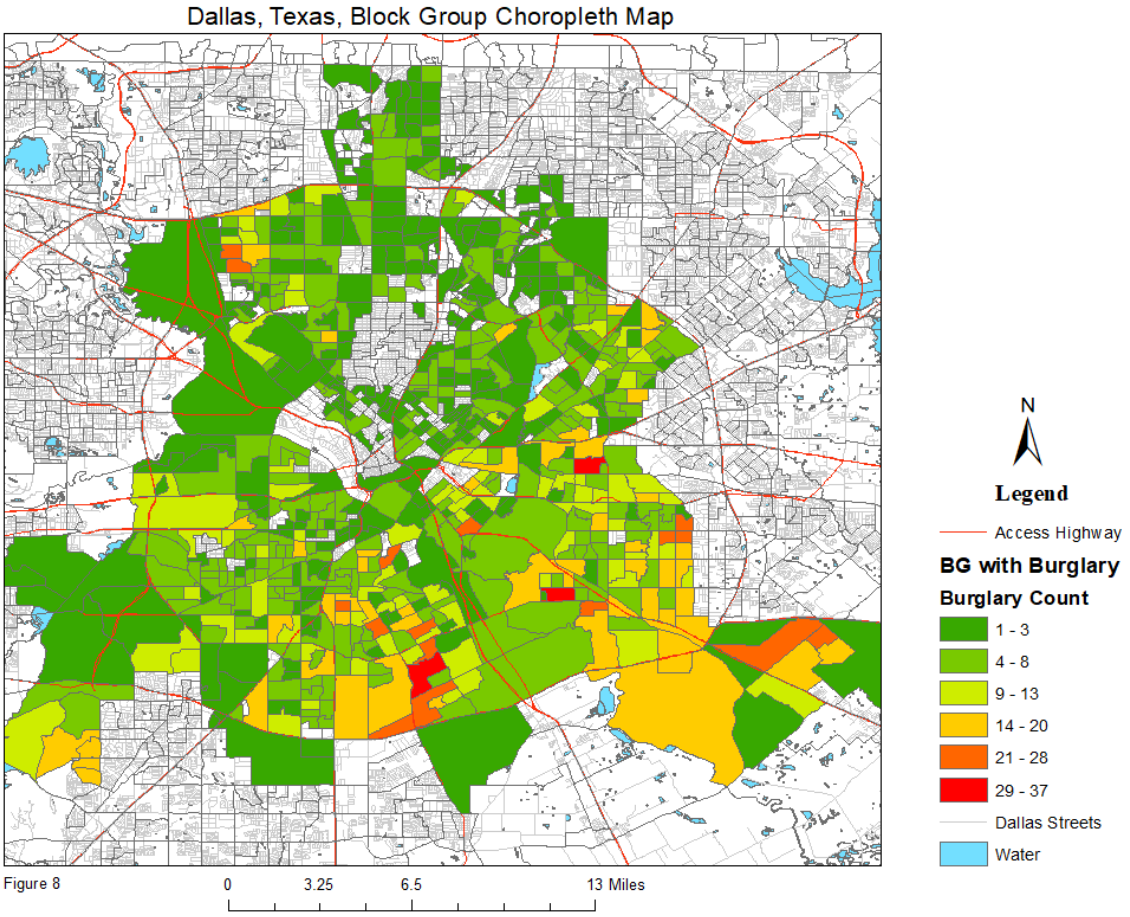

Figure 8

Multivariate Regression

Table 5. OLS Multivariate Regression

Values	R	R Square	Adjusted R Square	Std. Error of Estimate	AIC
Model 1	0.49	0.24	0.237	4.74	2223.65
Model 2	0.532	0.283	0.28	4.61	2182.22
Model 3	0.648	0.42	0.417	4.12	2033.4
Model 4	0.701	0.491	0.488	3.887	1841.85

Table 5 shows the results from all four models after conducting the OLS multivariate regression analysis. Model 1 is concerned with the three variables representing social disorganization theory, and their ability to explain the rate of residential burglary. Overall, the model shows that the variables explained 24% of burglary variation. Model 2 addressed the three variables chosen to represent opportunity theory and their ability to explain the rate of burglary. Overall, the model provided a 28% explanation in burglary variation. Model 3 was devised after the previous two models in attempts to produce a more considerable degree of explanation in burglary variance. The model includes all three social disorganization variables and the prior burglary variable from opportunity theory, as the prior burglary was the strongest predictor and only significant variable found from model 2 (as described in Table 6). Model 3 produced a 42% explanation in burglary variation. Lastly, model 4, which included all variables from model 3 and the inclusion of the *burglary lag* variable, explained 49% of burglary variation. All four models yielded a .000 significance level ($p < .001$). The Akaike's information criterion (AIC) was later included in all four OLS models, to compare the quality of models with each other. Results yielded a progressively decreasing AIC score through the models, demonstrating the increasingly better modular fit, with model 4 producing the most favorable (lowest) AIC score of 1841.85.

Table 6. Model 1 and 2 Coefficients

Values	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
Independent Variables					
Soc. Dis.					
(Constant)	-2.20	0.67		-3.31	0.001
Tenure Rent Count	-0.01	0.00	-0.71	-12.42	0.000
Poverty Count	0.01	0.00	0.67	11.66	0.000
Race Het. Index	3.91	0.35	0.39	11.31	0.000
Opp.					
(Constant)	4.30	0.39		11.16	0.000
Housing Count	0.00	0.00	0.01	0.35	0.725
BG within 1000Ft	0.26	0.36	0.02	0.74	0.459
Prior Burglary	7.34	0.44	0.53	16.54	0.000

Table 6 above describes the coefficients of variables included in models 1 and 2. As stated previously, all of the social disorganization variables were found to be significant ($p < .001$); however, only one opportunity theory variable was statistically significant: prior burglaries/near repeats ($p < .001$). Furthermore, all variables, excluding *tenure rent count,* demonstrated a positive relationship with residential burglary. This means where there are fewer rental properties (less residential instability), the model predicts there will be more burglary. This finding contradicts previous literature that has correlated increased residential instability (via housing tenure) with higher rates of burglary (Nobles et al., 2016; Zhang & Song, 2014;).

Table 7. Model 3 and 4 Coefficients Values

	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
Model 3					
Independent Variables					
Soc. Dis.					
(Constant)	1.21	0.59		-2.06	0.039
Tenure Rent Count	-0.01	0.00	-0.58	-11.51	0.000
Poverty Count	0.01	0.00	0.53	10.33	0.000
Race Het. Index	2.83	0.31	0.28	9.11	0.000
Opp.					
Prior Burglary	6.10	0.41	0.44	14.80	0.000
Model 4					
Independent Variables					
Soc. Dis.					
(Constant)	-1.99	0.55		-3.59	0.000
Tenure Rent Count	-0.01	0.00	-0.46	-9.26	0.000
Poverty Count	0.01	0.00	0.48	9.93	0.000
Race Het. Index	1.36	0.33	0.14	4.15	0.000
Opp.					
Prior Burglary	5.51	0.39	0.40	14.09	0.000
Control Variable					
BurglaryLag	0.47	0.05	0.32	9.96	0.000

Table 7 above describes the coefficients of models 3 and 4. All variables for both models remain significant as $p < .001$, and, excluding *tenure rent count*, express a positive relationship with residential burglary.

Chapter 8: Discussion

Results obtained from factor analysis, Cronbach's alpha, the OLS models, and spatial autocorrelation provided interesting findings. Some are consistent with prior research and contribute to existing literature, while others conflict with the theoretical explanation and justification for the implementation of their respective variables. Furthermore, interpretations from these findings, particularly from the integrated theoretical model, may contribute to future research and provide the possibility for other studies to implement similar models. The following sections discuss the results from the above analysis, based on the respective theories' variables and the control variable of *burglary lag.*

Social Disorganization Theory

Overall, the three variables representing social disorganization provided the strongest correlations with and explanation for residential burglary, while maintaining a consistent statistical significance of $p < .001$. With an R^2 value of .24, this OLS regression model created from social disorganization successfully explained 24% of residential burglary. Residential instability, as measured via *tenure rent count*, was the strongest correlation, from both models 1 and 3, and it's the second highest in magnitude in the final, spatially lagged model. This variable is also the only negative relationship with burglary, which contradicts existing research (Nobles et al., 2016; Zhang & Song, 2014). A potential explanation for this finding could be derived from a potential offender's view of a socially disorganized neighborhood. Rented homes might appear as less valuable/opportunistic in Dallas, regardless of the previously explained theoretical logic with informal social controls and collective efficacy. This hypothesis further demonstrates the necessity for an integrated theoretical model study replication, which would also include offender-based data, to account for opportunity theory's relationship with social disorganization.

Initially, an error was made in which both models were created with a *racial heterogeneity* index calculation that lacked the Hispanic/Latino population in the formula. These models yielded R^2 values of .15 and .16, respectively. After the correction and inclusion of this racial category within the formula, the final model's R^2 values increased to .24 and .42, respectively. Thus, this demonstrated how vital this variable is as a representative of social disorganization theory and the overall explanation for residential burglary. However, this variable was the weakest bivariate correlated variable with the other measures of social disorganization (Table 2) and the weakest correlated variable with burglary in all the OLS models (Tables 6 and 7). With bivariate correlations of .083 and -.10 for *tenure rent count* and *poverty count* respectively, *racial heterogeneity* certainly expressed the weakest correlations shown in Table 2. This contradicted existing literature that yielded .48 and .68 bivariate correlations with percent rentals and percent below poverty, respectively (Zhang & Song, 2014). A potential justification for this finding is that the previous research operationalized race by block group as a percentage (0-100%), whereas the *racial heterogeneity* index for this thesis was derived from a formula that produced values on a min-max scale of 0-2. Therefore, since these scales of measure vary, they could be responsible for contributing to the weak *racial heterogeneity* correlation found in this study. However, this factor would not have entirely explained the significant degree in magnitudes of correlations. While the correlation between *racial heterogeneity* and *poverty count* was weak, it was also found to be negative and contradicted existing literature (Chamberlain & Boggess, 2016; Nobles et al., 2016; Zhang & Song, 2014). Theoretically, *racial heterogeneity* had been explained previously in this thesis regarding its effects on informal social controls and collective efficacy. Alternatively, from an offender's viewpoint, "increased diversity may provide anonymity for burglars of varying

racial/ethnic compositions, suggesting that difference in diversity may *increase* attractiveness rather than decrease" (Chamberlain & Boggess, 2016, p. 7). This argument both (i) bleeds into opportunity theory, regarding what offenders might view as more opportunistic for burglary based on their own race, and (ii) further asserts the necessity for primary, offender-based data collection, to potentially provide a more transparent explanation for residential burglary.

Opportunity Theory

Overall, the opportunity measures largely failed in explaining residential burglary, with *housing count* and *proximity of access highway* being insignificant. However, the *proximity of prior burglary* was the only significant *(*$p < .001$) and the best explanatory variable from opportunity theory for residential burglary. This finding could be due to multiple factors, including the restrictions placed on the two dichotomous indicators of *proximity of prior burglary* and *proximity of access highway*. For example, multiple clusters/hotspots of *prior burglary* were observed in ArcGIS within neighboring block groups, just beyond the set distance parameter of 300 feet. Therefore, the future inclusion of these block groups via an expanded distance parameter by only a few hundred feet could potentially provide an even stronger correlation between this variable and residential burglary. The *proximity of access highway's* finding is particularly interesting, considering this thesis had more block groups on average, which were measured to be within 1,000 feet of an access highway (42%), compared to previous research in Jacksonville of 38% on average (Nobles et al., 2016). Future research could include the selection of access highways through the MTFCC designation of each road, which are labeled under the found TIGER/Line shapefile *primary roads*. This would allow for the inclusion of varying access roads and a further expansion of this opportunity variable.

Integrated Theoretical Model

The original integrated theoretical model created for this research, including three variables from social disorganization and three from opportunity theory, ultimately failed as one opportunity measure, *prior burglaries*, contributed significantly to the final model. Nevertheless, an OLS model was created from the final five variables (model 4) and yielded a strong, statistically valid explanation for residential burglary. Considering the strength of the prior burglary variable, an integrated model was created in combination with social disorganization's variables (model 3) and resulted in a much more robust explanation for burglary with an R^2 value of .42. When observing that the inclusion of *proximity of prior burglary* nearly doubled the variance explanation of residential burglary (compared to model 1's R^2 value of .24), the importance of this variable cannot be overstated. Based on these interpretations, there is sufficient evidence to reject the null hypothesis that *there is no model improvement when social disorganization and opportunity variables are introduced into a multivariate model of residential burglary*. Furthermore, after including the spatial autocorrelation control variable of *burglary lag* in model 4, the degree of explanation increased even further to 49%. This finding further supports the rejection of the null hypothesis and supports the alternative hypothesis that *a multivariate model of residential burglary is stronger (more variance explained) when composed of social disorganization and opportunity variables versus an independent model of either construct, respectively.* Additionally, previous research in Louisville, Kentucky, created OLS models through approximately 17,432 counts of burglary (3 years accumulated) aggregated to a block group level (556), included 10 independent variables, and yielded weaker results than these integrated theoretical models (Zhang & Song, 2014). The OLS model explained 41% data variation in burglary, with an AIC score of 3,356 (Zhang & Song, 2014). This thesis's final OLS

model was able to explain 49% of the spatial variation in burglary with five variables, 713 block groups, 4212 incidents of burglary, and an AIC score of 1841.

It was initially anticipated that results from the integrated theoretical model would yield an exponential increase in the explanation for burglary. There are several possibilities as to why the findings fell short of expectations. Firstly, this model was only able to successfully include four variables, which were shown to be statistically significant, before the OLS regression. As noted above, *proximity to access highway* was insignificant. However, if the set parameter distance of 1,000 feet was increased to include additional block groups that experienced burglary, it could be sufficient enough to transform the variable's significance to $p < .05$. Additionally, the inclusion of other opportunity-based variables (if they were found to be significant) could increase the model's strength in residential burglary explanation. Such variables might include offender-based data, street connectivity, population density and age, family disruption, and CPTED elements (Nobles et al., 2016; Zhang & Song, 2014).

Similarly, regarding social disorganization theory, this model lacked Shaw and McKay's traditional measures of residential mobility and "disruption of community social organization" (Sampson & Groves, 1989, p. 775). These disruptions could be measured through a 5-item Likert scale, to establish the degree of the city's collective efficacy. The Likert scale's measures to each question would appear as "very likely, likely, neither likely nor unlikely, unlikely, or very unlikely" (Cullen et al., 2014, p. 125). Utilizing Robert J. Sampson's original questions to obtain a measure of informal social controls would be an appropriate means of obtaining valid data, and doing so would contribute to the research's external validity. Sampson's five questions inquired if citizens in the community believed "that their neighbors could be counted on to intervene in various ways" (Cullen et al., 2014, p. 125), and those various ways are as follows:

> "(i) children were skipping school and hanging out on a street corner, (ii) children were spray-painting graffiti on a local building, (iii) children were showing disrespect to an adult, (iv) a fight broke out in front of their house, and (v) the fire station closest to their home was threatened with budget cuts" (Cullen et al., 2014, p. 125).

Furthermore, the surveys would contain a second set of Sampson's original questions, answered by a 5-item Likert scale, to obtain a measure of "social cohesion and trust" (Cullen et al., 2014, p .125). Those questions' Likert scale will contain the items strongly agree, disagree, undecided, agree, and strongly agree. Sampson's questions are in the form of statements and are as follows: "people around here are willing to help their neighbors, this is a close-knit neighborhood, people in this neighborhood generally don't get along with each other, and, people in this neighborhood do not share the same values" (Cullen et al., 2014, p. 125).

Chapter 9: Limitations

Both dichotomous indicator variables, *proximity to access highway*, and *prior burglary*, represent limitations for this research. The potential relationship between residential burglary and these opportunity variables is unknown beyond the set parameters of distance and time. While this research design was concerned with residential burglary, only single-family homes were selected for the sample data set. It is unknown how future replication of this methodology and analytic strategy will perform involving other types of residences. The data set is also hindered by (i) only including known burglaries reported to DCPD, (ii) lacking offender-based data including employment/residential addresses, prior criminal history, and economic status, and (iii) the exact time of the burglary, for the most part in the data set, being unknown for each case. However, that is the nature of and a common issue when working with burglary incident report data sets. Regarding the analytic strategy for this thesis, there was no pre/posttest

implemented, which could allow for a policing strategy to be proposed, implemented, and then evaluated to determine if it had any effect on the residential burglary rate. Lastly, with the time frame of 30 days for the variable *proximity of prior burglary,* the last 2 days of December 2016 burglaries were not included in the analysis for this variable. However, considering the volume of incidents collected for near-repeat, prior burglaries gathered throughout the calendar year, this limitation is statistically insignificant and does not alter the data overall.

Chapter 10: Conclusion

Social disorganization and opportunity theories have demonstrated their ability to explain crime in previous research. This thesis began with the hypothesis that an integrated theoretical model approach would better explain residential burglary than a singular theoretical model and was overall successful in doing so. A key finding derived from this research is how crucial the *proximity of prior burglary* variable is in this integrated theoretical model framework, which has been identified in prior research for its independent significance via near-repeat literature. The original intention was that a combination of six variables would yield an exponential explanation for residential burglary, as opposed to the segregation of three variables per respective theories. While the final integrated theoretical model only contained four variables, the findings still indicate the success of and support for an integrated model. Overall, this thesis mainly explained residential burglary through social disorganization variables. Future research is possible through replication of this model in a similar study location, with the same unit of analysis and operationalized variables.

References

Akers, L. R., & Sellers, S. C. (2013). *Criminological theories: Introduction, evaluation, and application.* New York, NY: Oxford.

Bernasco, W., Johnson, D. S., & Ruiter, S. (2015). Learning where to offend: Effects of past on future burglary locations. *Applied Geography, 60,* 120-129.

Bernasco, W., & Luykx, F. (2003). Effects of attractiveness, opportunity and accessibility to burglars on residential burglary rates of urban neighborhoods. *Criminology, 41*, 981-1001.

Cancino, M. J. (2003). Breaking from orthodoxy: The effects of social disorganization on perceived burglary in nonmetropolitan communities. *American Journal of Criminal Justice, 28*(1), 125-145.

Center for Problem-Oriented Policing (PopCenter). (2019). *Step 15: Know what kind of problem you have.* Retrieved from https://popcenter.asu.edu/content/step-15-know-what-kind-problem-you-have

Chamberlain, W. A., & Boggess, N. L. (2016). Relative difference and burglary location: Can ecological characteristics of a burglar's home neighborhood predict offense location? *Journal of Research in Crime and Delinquency, 53*(6), 872-906.

Chastain, B., Qiu, F., & Piquero, R. A. (2016). Crime theory evaluation using simulation models of residential burglary. *American Journal of Criminal Justice, 41*(4), 814-833.

Cullen, T. F., Agnew, R., & Wilcox, P. (2014). *Criminological theory: Past to present.* New York, NY: Oxford.

Cullen, T. F., & Wilcox, P. (2010). *Encyclopedia of criminological theories* (Vols. 1-2). California: SAGE.

D'Alessio, J. S., Eitle, D., & Stolzenberg, L. (2012). Unemployment, guardianship and weekday

residential burglary. *JQ: Justice Quarterly, 29*(6), 919-932.

Dallas Open Data. (2019). *Dallas Police public data – RMS incidents – With GeoLocation* [Data set]. Retrieved from https://www.dallasopendata.com/Public-Safety/Dallas-Police-Public-Data-RMS-Incidents-With-GeoLo/4ea4-q4ui

Federal Bureau of Investigation. (2017). *Uniform crime report* [Burglary]. Retrieved from https://ucr.fbi.gov/crime-in-the-u.s/2017/crime-in-the-u.s.-2017/topic-pages/burglary

Frith, J. M., Johnson, D. S., & Fry, M., H. (2017). Role of the street network in burglars' spatial decision-making. *Criminology, 55*(2), 344-376.

Groff, R. E., & La Vigne, G. N. (2001). Mapping an opportunity surface of residential burglary. *Journal of Research in Crime & Delinquency, 38*(3), 257-279.

Hodgkinson, T., & Andresen, A. M. (2019). Changing spatial patterns of residential burglary and the crime drop: The need for spatial data signatures. *Journal of Criminal Justice, 61*, 90-100.

Johnson, D. S., Bernasco, W., Bowers, J. K., Elffers, H., Ratcliffe, J., Rengert, G., & Townsley, M. (2007). Space-time patterns of risk: A cross-national assessment of residential burglary victimization. *Journal of Quantitative Criminology, 23*(3), 201-219.

Kubrin, C. E. (2000). Racial heterogeneity and crime: Measuring static and dynamic effects. *Research in Community Sociology, 10*, 189-219.

Lanier, M. M., Henry, S., & Anastasia, M. J. D. (2015). *Essential criminology.* Colorado: Westview Press.

Mburu, W. L., & Bakillah, M. (2016). Modeling spatial interactions between areas to assess the burglary risk. *ISPRS International Journal of Geo-Information, 5*(4), 47-63.

Nee, C. (2003). Research on burglary at the end of the millennium: A grounded approach to

understanding crime. *Security Journal*, *16*(3), 37-44.

Nobles, R. M., Ward, T. J., & Tillyer, R. (2016). The impact of neighborhood context on spatiotemporal patterns of burglary. *Journal of Research in Crime and Delinquency, 53*(5), 711-740.

Piza, L. E., & Carter, J. G. (2018). Predicting initiator and near repeat events in spatiotemporal crime patterns: An analysis of residential burglary and motor vehicle theft. *JQ: Justice Quarterly, 35*(5), 842-870.

Police Data Initiative. (2017). *Incident data sets, Dallas Police Department* [Data set]. Retrieved from https://www.policedatainitiative.org/datasets/incidents/

Quick, M., Li, G., & Brunton-Smith, I. (2018). Crime-general and crime-specific spatial patterns: A multivariate spatial analysis of four crime types at the small-area scale. *Journal of Criminal Justice, 58,* 22-32.

Reisig, D. M., & Cancino, M. J. (2004). Incivilities in nonmetropolitan communities: The effects of structural constraints, social conditions, and crime. *Journal of Criminal Justice, 32*(1), 15-29.

Ren, L., Zhang, Y., & Zhao, S. J. (2015). The deterrent effect of the castle doctrine law on burglary in Texas: A tale of outcome in Houston and Dallas. *Crime & Delinquency, 61*(8), 1127-1151.

Roth, J. J. (2018). Property crime clearance in small jurisdictions: Police and community factors. *Criminal Justice Review, 43*(4), 477-493.

Sampson, J. R., & Groves, W. B. (1989). Community structure and crime: Testing social-disorganization theory. *The American Journal of Sociology, 94*(4), 774-802.

Sampson, J. R., & Wooldredge, D. J. (1987). Linking the micro- and macro-level dimensions of

lifestyle—routine activity and opportunity models of predatory victimization. *Journal of Quantitative Criminology, 3*(4), 371-393.

Udo-Akang, D. (2012). Theoretical constructs, concepts, and applications. *American International Journal of Contemporary Research, 2*(9), 89-97.

United States Census Bureau. (2019). *Housing definitions* [PDF file]. Retrieved from https://www.census.gov/housing/hvs/definitions.pdf

United States Census Bureau. (2019). *QuickFacts: Dallas city, Texas.* Retrieved from https://www.census.gov/quickfacts/dallascitytexas

United State Census Bureau. (2019). *TIGER/Line Shapefiles – 2019 Dallas, Texas, block groups* [Data set]. Retrieved from https://www.census.gov/cgi-bin/geo/shapefiles/index.php

Weisel, L. D. (2002). *Guide No. 18: Burglary of single-family houses.* Retrieved from https://popcenter.asu.edu/content/burglary-single-family-houses-0

Whyte, F. W. (1943). Social disorganization in the slums. *American Sociological Review, 8*(1), 34-39.

Yuan, Y., & McNeeley, S. (2017). Social ties, collective efficacy, and crime-specific fear in Seattle neighborhoods. *Victims & Offenders, 12*(1), 90-112.

Zhang, H., & Song, W. (2014). Addressing issues of spatial spillover effects and non-stationarity in analysis of residential burglary crime. *GeoJournal, 79*(1), 89-102.