

RACE, PLACES OF WORSHIP, AND CRIME: EXAMINING THE EFFECTS OF PLACES  
OF WORSHIP ON NEIGHBORHOOD CRIME RATES IN MILWAUKEE, WISCONSIN

by

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## ABSTRACT

### RACE, PLACES OF WORSHIP, AND CRIME: EXAMINING THE EFFECTS OF PLACES OF WORSHIP ON NEIGHBORHOOD CRIME RATES IN MILWAUKEE, WISCONSIN

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The University of Wisconsin-Milwaukee, 2023  
Under the Supervision of Professor Marcus Britton

While prior research has examined how measures of religion such as religious adherence are associated with crime, inconsistent results surrounding the strength and direction of the association have emerged. Additionally, less research has focused on the extent to which the mere presence of religious institutions predicts criminological outcomes. Drawing on social control theory, social disorganization theory, ecological religion, and complex religion, this study aims to contribute to existing research by examining the extent to which places of worship within urban neighborhoods in a Midwestern landscape are associated with lower rates of crime, and how this association may vary depending on the neighborhood's racial makeup and levels of socioeconomic disadvantage. Findings from spatial autoregressive models differ across religious traditions and denominations. Catholic churches are negatively associated with violent and property crime, and this association is more pronounced for predominantly Black neighborhoods regarding violent crime. Black Protestant churches are positively associated with violent and property crime. Mainline Protestant churches are positively associated with violent crime. Jewish places of worship are positively associated with crime, and Mormon churches are negatively associated with crime. Findings illuminate the importance of addressing the local-level effects of places of worship, considering how social, racial, and geographic characteristics inform these

effects, and exploring how the institutional capacities of places of worship to enact informal social control vary by religious traditions and denominations.

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## LIST OF ABBREVIATIONS

OLS	Ordinary Least Squares Regression
SAR Models	Spatial Autoregressive Models

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## Introduction

Prior research has examined how forms of religiosity<sup>i</sup> such as religious adherence are connected to specific social and emotional outcomes, including health, well-being, and crime (Baier and Wright, 2001; Harris and Ulmer, 2017; Heaton, 2006; Hirschi and Stark, 1969; Koenig, 2009; Lim and Putnam, 2010; Stark et al., 1982; Stark, 1996; VanderWeele, 2017). However, existing studies have produced inconsistent results surrounding the strength and direction of the association between religion and crime (Dilulio Jr., 2009; Evans et al 1995; Hirschi and Stark, 1969; Stark et al., 1982; Stark, 1996; Pope et al 2014). Additionally, less research has focused on the extent to which the mere presence of religious institutions demonstrates a connection to these outcomes, and of the minimal research that has, most tends to focus on macro-level analyses and larger population areas such as counties and states, potentially obscuring how community-specific characteristics may condition the impact of local religious institutions (Lee, 2006; Harris and Ulmer, 2017; Thomson Jr., 2021; Warner and Konkel, 2019).

Recognized as highly influential and stable neighborhood institutions, many religious congregations serve as social safety nets for underserved communities by providing various social welfare services, and several faith-based organizations are directly funded via the government to perform these tasks (Bielefeld and Cleveland, 2013; Dilulio Jr., 2009; Lee, 2006; Kinney and Winter, 2006). Their presence may assist in a community's ability to implement and maintain informal social control, potentially limiting the effects of social disorganization and, in turn, contributing to crime prevention (Warner and Konkel, 2019). The role of these organizations within communities of color, especially Black communities, can also potentially strengthen community cohesion and reduce crime (Barnes, 2005; Pattillo-McCoy, 1999a; Sampson et al., 1997). Examining the specific effects of places of worship within neighborhood

settings can draw attention to the mechanisms by which these organizations serve different roles within the context of community sustainability and influence crime rates. Additionally, highlighting the racial composition of these respective communities can provide insight into how places of worship inform and/or reflect levels of ecological religion within a community, addressing a potentially latent interaction of race and religion that may influence community crime.

This study aims to contribute to and expand on existing research by raising two questions: 1) To what extent are places of worship within urban neighborhoods associated with lower rates of crime? 2) How does this association vary depending on the neighborhood's racial makeup and levels of socioeconomic disadvantage? This study addresses these questions through a two-pronged approach via the use of an aggregated and disaggregated measure of places of worship, with the disaggregated measure based off the RELTRAD coding scheme (Shelton and Cobb, 2017; Steensland et al., 2000; Woodberry et al. 2012). I specifically focus on the city of Milwaukee, Wisconsin for this analysis. Scholars have labeled Sunday morning church services as "the most segregated hour in America" (Winter, 1962, p. 30), with socioeconomic homogeneity within religious congregations being a prevalent marker of this segregation (Hadaway et al., 1984). Milwaukee's history as a hyper-segregated city can provide significant insight as to how religious spaces may distinctly influence racially marginalized and economically disadvantaged urban communities while shedding light on the connection specific racial groups may have to religious spaces. Additionally, the various responses that Catholic and Protestant churches during the Second Great Migration had to the influx of African Americans into Milwaukee affected the extent to which these churches engaged with the communities surrounding them, potentially informing their ability to enact informal social control and impact

crime rates (Avella and Jablonsky, 2014; Borg, 2020; Walch, 1978). Furthermore, the association between places of worship and crime has been demonstrated to vary by the denomination of the place of worship (Desmond et al., 2010; Harris and Ulmer, 2017; Triplett et al., 2013; Warner and Konkel, 2019). To address these inquiries, this study utilizes a cross sectional design and spatial autoregressive (SAR) models with generalized spatial two-stage least squares estimators. Employing data from the Data Axle Reference Solutions United States Business database, the United States Census Bureau's American Community Survey, and the Milwaukee Wisconsin Incident-Based Reporting historical crime dataset, this study examines the association between the number of places of worship and the number of property and violent crimes (over a 36-month period) within Milwaukee neighborhoods at both the census block group and tract level. Drawing on social control theory (Agnew, 1995; Hirschi, 1969; Wiatrowski et al, 1981), social disorganization theory (Kornhauser 1978; Kubrin and Weitzer, 2003; Shaw and McKay 1942), ecological religion (Dilulio Jr., 2002 & 2009), and complex religion (Wilde, 2018; Wilde and Glassman, 2019), I hypothesize that 1) communities with more places of worship will experience lower rates of crime, 2) neighborhoods with more Catholic churches will experience lower rates of crime, 3) the association between places of worship and crime will be more pronounced for predominantly Black communities, and 4) the association between places of worship and crime will be more pronounced for socioeconomically disadvantaged predominantly Black communities. I conclude with a discussion of the findings, the important contributions of this study, and directions for further research.

## Theoretical Frameworks and Hypotheses

## Social Control Theory

Introduced and advanced by Travis Hirschi (1969), social control theory seeks to explain how individuals are bonded to society and how a weakening or lack of these bonds affects the likelihood of an individual committing a crime. Explaining how individuals conform to conventional societal norms, Hirschi (1969) posits that this conformity is achieved through the presence of four types of bonding: attachment, commitment, involvement, and belief.

Attachment refers “to the affective ties” that individuals form to people holding a significant position in their lives, such as parental figures, while commitment is related to how interested and invested an individual is in activities that align with conventional values (Wiatrowski et al, 1981, p. 525; see also Agnew, 1985). Correspondingly, involvement refers to the length and duration of participation in conventional activities, and the more an individual is involved in conventional activities, the less time they are presumed to have to engage in delinquent acts (Agnew, 1995). Lastly, belief is the “acceptance of the moral validity of the central social-value system” (Wiatrowski et al, 1981, p. 525), and individuals who not only adhere to, but *believe* they should adhere to the rules of society, are less likely to become occupied with delinquent behaviors (Agnew, 1995). While this theory presents a micro-level lens to explain crime causation, scholars have pointed to the importance of understanding how social control operates within meso- and macro-level contexts such as neighborhoods and cities. Additionally, social control can be distinguished into two types: formal and informal; where formal social control represents concrete laws and sanctions set in place by societal entities to regulate behavior, informal social control refers to the informal actions and shared values that individuals partake in to encourage and maintain conformity to conventional norms (Kubrin, 2010). In considering the community level, informal social control can be described as “the scope of collective

intervention that the community directs toward local problems, including crime” (Kubrin, 2010, p. 829, see also Kornhauser, 1978). Scholars have utilized the concept of informal social control to better understand how crime rates vary across communities, and the extent to which neighborhood institutions such as schools and places of worship have the capacity to enact informal social control (Warner and Konkel, 2019; Willits et al, 2013).

### Social Disorganization Theory

Informal social control is an important component of social disorganization theory. Originally developed by Shaw and McKay (1942), the criminological theory of social disorganization posits that the ecological characteristics of a community are linked to the creation of conditions conducive or unfavorable to criminal activity (Bursik, 1988; Kubrin and Weitzer, 2003). Factors such as poverty, residential instability, racial and ethnic diversity, and weak social networks are theorized to be indirectly linked to crime likelihood because they reduce the capacity for communities to develop shared valued systems and regulate public behavior, which negatively impacts the ability for communities to enact informal social control (Bursik and Gramsick, 1993; Kubrin and Weitzer, 2003). It is important to note that social disorganization theory does *not* frame poverty, residential instability, and racial and ethnic heterogeneity as *direct* predictors of community crime rates; instead, these conditions are theorized as affecting the ability for communities to foster informal social control and social integration (Kubrin, 2010). In revisiting institutions, neighborhood institutions have an important role in the extent to which individuals within a community “attain valued goals, develop extensive social ties, and strengthen societal values” (Warner and Konkel, 2019, p. 1184). Accordingly, issues such as poverty and residential instability can reduce the ability for neighborhood institutions to provide resources necessary for residents to successfully achieve

these measures, which in turn, may limit residents' ties to these institutions, hindering their institutional capacity to enact social control (Kornhauser, 1978; Warner and Konkel, 2019). However, institutions that can provide resources for the attainment of these measures may experience stronger resident-institutional attachment, increasing their ability to successfully enact informal social control (Warner and Konkel, 2019). In their examination of middle-class and high socioeconomic status communities, Shaw and McKay (1942) describe the linkage between conventional values, institutions, and informal social control, specifically the role of institutions in supporting, representing, and protecting conventional values:

The similarity of attitudes and values as to social control is expressed in institutions and voluntary associations designed to perpetuate and protect these values. Among these may be included such organizations as the parent-teachers associations, women's clubs, service clubs, churches, neighborhood centers, and the like. Where these institutions represent dominant values, the child is exposed to, and participates in a significant way in one mode of life only. While he may have knowledge of alternatives, *they are not integral parts of the system in which he participates* (Shaw and McKay, 1942, p. 171, emphasis added).

This insight draws attention to the role of neighborhood processes and institutions in not only strengthening social ties, but certain *types* of social ties. Kubrin and Weitzer (2003) discuss how types of social ties may differ in their ability to positively contribute to social control and reduce crime, calling attention to the importance of not grouping all social ties together. An example of why this disaggregation is important can be seen in Pattillo-McCoy's (1998b) ethnographic study in Chicago within a Black, middle-class neighborhood, which found that while the density of social networks and strength of institutional ties allowed for some residents to promote interpersonal connections and facilitate informal social control, other members within the same community and networks formulated strong social ties to criminal leaders and entities, which reduced the ability for the community to sufficiently address crime. These theoretical

developments point to the importance of understanding how social ties can both contribute to and hinder informal social control: when social ties are strong and *positively* aligned with a community's desire to live "in an area relatively free from the threat of crime" (Bursik and Grasmick, 1993 p. 15), informal social control is more likely to be positively maintained and effective, which in turn, reduces the likelihood of crime. Conversely, social ties can be strong and *negatively* aligned with a community's goal of being crime-free, and the strength of these social ties do not promote a form of social control that is effective towards this goal, resulting in an inability to significantly reduce crime.

### Moral Communities

Social disorganization theory provides a clear, foundational framework for understanding the mechanisms by which neighborhood institutions, and more specific to this study, places of worship, can function as neighborhood spaces that provide resources for residents to attain shared goals and support the development of positive, strong social ties for the enactment of informal social control. While scholars have presented theories such as the Hellfire Hypothesis to explain how religiosity and religious adherence function at the micro-level to deter crime (Hirschi and Stark, 1969), the moral communities thesis seeks to explicate the impact of aggregate religiosity (Baier and Wright, 2001). Considered to be one of the earliest macro-level explanations, the thesis posits that religious institutions can inform and facilitate "a sort of moral ecology that would condition the individual-level association between religiosity and illicit behavior" (Eitle, 2011, p. 65). An important part of this thesis, however, is that the ability for individual religiosity to inversely affect crime rates is contingent on the *strength* of community-level religiosity (Eitle, 2011; Stark et al, 1982). Stark (1996) contends that, rather than solely viewing religion as an individual trait, it should first be understood as a *group* property, or "the

proportion of persons in a given ecological setting who are actively religious” (p. 164).

Accordingly, when an individual’s social environment is permeated with religiosity and the majority of individuals within a social environment respect and accept religion and religious guidance as valid, individual religiosity should have a stronger impact on crime deterrence (Eitle, 2011; Stark et al, 1982; Stark, 1996).

### Ecological Religion

Some scholars have addressed the role of places of worship in contributing to the social order and value system of communities. For example, Altman and colleagues (2000) discuss how churches serve a function of a moral compass for many American rural communities. Additionally, Pattillo-McCoy (1998a) argues that the Black church serves as a “cultural blueprint” for civic and organizational activities, further pointing to the role of places of worship as beacons of direction. However, other scholars have presented a different way of conceptualizing the ecological effects of religion, focusing on the *presence* of religious institutions rather than measures such as religious adherence and attendance. Similarly aligned with social disorganization theory, the concept of ecological religion focuses on the role of religious institutions within “the ecology of urban life” (Dilulio Jr., 2002, p. 59). In contrast to organic and programmatic religion, which focus on the role of believing in a supernatural force and the impact of religiously affiliated programming, respectively, ecological religion is centered on the idea that individuals can still be exposed to and experience the effects of religious institutions without attending one, nor intentionally engaging with a religiously affiliated program (Dilulio Jr., 2002). Dilulio Jr. (2009) argues that less research has focused on the impact of ecological religion and raises the question of the role that “stained-glass windows”, in comparison to “broken windows” (see Wilson and Kelling, 1982) may have in the reduction of

neighborhood disorder and crime reduction. This theoretical contribution is particularly important because unlike the moral communities thesis that focuses on the percentage of residents who identify as religiously affiliated or attend religious services, ecological religion focuses on the impact that places of worship can have on community sustainability and individual behaviors, regardless of one's personal relationship with religion. Kinney and Winter's (2006) study in St. Louis, Missouri demonstrates this point well; in examining the association between religious spaces and neighborhood stability, the researchers found that the presence of storefront churches were positive contributors to this stability. These findings, along with Dilulio Jr.'s position, demonstrate the importance of considering the implications of religious structural presence, especially within urban communities subject to increased transitory nature (Dilulio Jr., 2009; Kinney and Winter, 2006). While measures of religion in the form of individual beliefs and service attendance are important to employ when examining the effects of religion on crime, examining how religious *institutional presence* functions within neighborhoods to reduce the effects of neighborhood disadvantage on crime is vital for understanding the structural mechanisms that continue to support the survival and sustainability of urban communities via less overt mechanisms. Devoting further attention to the effects of the presence of places of worship can provide further insight as to how their prevalence within neighborhoods contributes to the promotion of shared goals and social control, in turn, potentially reducing rates of crime. Accordingly, it is important to examine the function of religious places of worship as distributors of ecological religion. Therefore, this study's first hypothesis is as follows:

*Hypothesis 1: neighborhoods with more places of worship experience lower rates of crime than neighborhoods with fewer places of worship.*

Social disorganization theory and ecological religion also provide space for understanding how Catholic churches have historically played an important role as a neighborhood institution in the context of community sustainability, especially within Midwestern urban centers like Milwaukee. Catholic churches have demonstrated a clear and consistent commitment to civic engagement and social welfare (Greenberg, 2000). In the mid-1800s, cities such as Milwaukee and Chicago were experiencing significant population growth, and immigrant residents made up over sixty percent of Milwaukee's population in 1850 (Walch, 1978). Accordingly, Milwaukee was struggling to provide enough urban services to meet the needs of the city's residents. However, the Catholic church significantly assisted the city in its responses to these changes, especially through the establishment of schools, asylums, and hospitals. The social institutions associated with the Catholic church helped the city of Milwaukee address the need to educate and care for its growing number of residents, and these acts intentionally served all members of the community, not just Catholic adherents (Walch, 1978). Walch (1978) states that "Catholics did see themselves as citizens with an active concern for the quality of life in Milwaukee" (p. 31).

The hierarchical structure of Catholic churches also informs the way they may be able to serve as neighborhood institutions in manners that are different from other places of worship. Borg (2020) describes how Catholic churches, unlike Protestant churches, are centrally administered. Accordingly, individual Catholic churches that are a part of a larger Diocese do not have the individual autonomy to close or move unless this is a choice made by the Diocese's administration. This is significant because while many White Protestant churches had the option to depart the city as African Americans settled, the Catholic churches that stayed had to decide how to address the changing racial makeup of their neighborhoods (Avella and Jablonsky, 2014;

Borg, 2020). While concern and conflict arose within Catholic churches surrounding race and racial tensions, some Catholic leaders and congregations took public stances against racial inequality; for example, in the 1960s, St. Boniface became “a major center for Catholic-sponsored Civil Rights Activism” (Avella and Jablonsky, 2014, p. 1063).

The established commitment of Catholic churches within the framework of urban communities, along with the history of Catholic churches within Milwaukee, positions them as places of worship that may be particularly influential in the enactment of informal social control and crime reduction. Accordingly, the study’s second hypothesis is as follows:

*Hypothesis 2: Neighborhoods with more Catholic churches experience lower rates of crime than neighborhoods with fewer Catholic churches.*

### Complex Religion

Borrowing from the theory of complex inequality (see McCall, 2001), Wilde (2018) provides the concept of complex religion to emphasize the importance of examining the intersection of religion with other social characteristics. While most research examines religion’s association with certain items such as political affiliation while controlling for demographic characteristics including race and gender, complex religion argues that these “controlled” variables carry necessary information in our understanding of the differential effects of religion and should be examined via interaction (Wilde, 2018). While like the approach of intersectionality (see Crenshaw, 1989), complex religion focuses on overlap between social structures and religious affiliation (Wilde and Glassman, 2019). In conjunction with this focus, Wilde and Glassman (2019) find that the main ways religion is operationalized within current sociological studies is via the measurement of religious beliefs and/or affiliation.

The concept of complex religion articulates the reality of the embeddedness of religion in sociopolitical and economic processes, and, as a result, on different identity intersections: “religion was, and continues to, deeply intersect with race, ethnicity, class, and, consequently, gender and sexuality... for many religions, these “variables” cannot be separated” (Wilde, 2018, p. 294). The role of religion in the lives of individuals can differ significantly based on their embodied and socially ascribed identities. However, a component of religion that is overlooked in this assessment is the effect of religious structural presence in interaction with social characteristics: How does the presence of religious places of worship intersect with racial and class backgrounds to produce differential life experiences/outcomes? In furthering the theory of complex religion, it is important to advocate not only for more religion-social characteristics interactions, but to also expand the ways in which we operationalize religion to include the mere presence of religious spaces within this interaction.

Religious institutions have a history of serving as havens for various social services and have the potential to minimize resource gaps, particularly for “society’s most distressed populations” (Dilulio Jr., 2009). Accordingly, these institutions play a significant role within the Black community and hold deep historical roots, and scholars have posited that the Black church has functioned as a “semi-involuntary institution” for the Black community, especially within the rural South (Ellison and Sherkat, 1995; Nelson, Yokley, and Nelson, 1975). Dating back to the 1800s, research has demonstrated the role that religion played in the lives of enslaved Black individuals, who eventually sought “to define their own religious identity beyond the plantations” (Harris and Ulmer, 2017, p. 297). Throughout multiple divergences and the development of new denominations, the Black Protestant Church functioned as a grounding force and source of support for the Black community, and as Barnes (2005) notes, the

dependency on Black churches for community sustainability prompted “social action that took the form of church-based organizations and community service” (p. 974). Understanding the historical connection that religious organizations have within different racial groups such as the Black community is important for analyzing how the effects of these religious organizations on various community outcomes may vary by the racial composition of that community.

Correspondingly, the present study seeks to contribute to this gap in research surrounding complex religion by examining a religion-race interaction in the form of quantity of places of worship and urban neighborhood racial composition, including both an aggregated and disaggregated measure of places of worship. The study also includes a religion-race-disadvantage interaction that examines how the effects of places of worship on crime rates vary for socioeconomically disadvantaged Black neighborhoods. Doing provides insight into how the racial composition of urban neighborhoods impacts the mechanisms by which the presence of religious spaces is associated with neighborhood outcomes, such as crime, and the extent to which places of worship attend to resource disparities and have pronounced effects in disadvantaged Black neighborhoods. Accordingly, this study’s third and fourth hypotheses are as follows:

*Hypothesis 3: the association between the quantity of places of worship and neighborhood crime rates will be more pronounced for predominantly Black neighborhoods than for other neighborhoods.*

*Hypothesis 4: the association between the quantity of places of worship and neighborhood crime rates will be more pronounced for socioeconomically disadvantaged predominantly Black neighborhoods than for other neighborhoods, including less disadvantaged predominantly Black ones.*

## Prior Research on Religion, Religious Space, and Crime

### Religion and Crime

Scholars have documented contradictory findings regarding the association between religion and crime, particularly when it comes to the direction of this relationship (Dilulio Jr., 2009; Evans et al 1995; Hirschi and Stark, 1969; Pope et al., 2014; Stark, 1996;). Hirschi and Stark's study (1969) sparked significant concern surrounding the religion-crime connection, due to their findings that "students who attend church every week are as likely to have committed delinquent acts as students who attend church only rarely or not at all" (Hirschi and Stark, 1969; p. 212). However, subsequent research has indeed found inverse associations (Evans et al., 1995; Baier and Wright, 2001; Pope et al., 2014). Conversely, other research has found positive correlations and associations between religion and crime, including a particularly significant relationship between religiosity and homicide (Paul, 2005; Jensen, 2006). Some research has found that the direction of this relationship varies by the aggregate levels of religiosity present within a community (Stark et al, 1982; Stark, 1996). For example, Stark et al (1982) found that in moral communities with a strong religious climate, the correlation between religiosity and delinquency was substantially stronger than for secular communities. It is clear from the combination of these findings that more research is needed to continuously unpack the role of religion on crime rates and the many mechanisms by which other variables may mediate or moderate religion's effects on crime.

### Religious Spaces and Crime

The prevalence of churches within communities across the United States points to the importance of understanding the role that religious places of worship have on crime rates.

Focusing on geographic variation, Lee (2006) employs a macro-level analysis of 902 rural

counties in the United States to find that more churches per capita is associated with significantly lower rates of violence in rural areas, specifically in the South and the Midwest. Sourcing data from 66 Kentucky neighborhoods in Louisville and Lexington to examine the direct relationship between church presence and social processes theorized to be linked to crime prevention, Warner and Konkel (2019) found that higher quantities of churches were associated with higher levels of social ties, which, via the theoretical framework of social disorganization theory, are key components to the prevention of crime. However, variation is still present across studies; examining the association between church quantity and crime rates within the city of Norfolk, Virginia, Triplett and colleagues (2013) found neighborhood church count to be “positively related to both street crimes and domestic assaults” (p. 803) and, when accounting for denomination, found evangelical churches to demonstrate stronger associations with domestic assaults than non-evangelical churches. Conflicting findings such as these highlight the importance of continuing to understand how various places of worship function at the neighborhood and community levels. Additionally, many previous studies demonstrate a regional similarity within past research; most examinations of places of worship and crime prevention processes and/or crime rates have tended to focus on Southern states and rural areas.

The study that most closely aligns with the present project is by Desmond and colleagues (2010), which examined the association between congregations and violent and property crimes at the block group level within the city of Indianapolis, Indiana. The researchers found that mainline and Black Protestant congregations were positively associated with vehicle theft and commercial burglary, with mainline Protestant congregations also being positively associated with larceny. Additionally, civically engaged congregations (see Tolbert et al, 1998 for a detailed definition and classification of civically engaged congregations) were inversely associated with

rates of commercial burglary and larceny (Desmond et al, 2010). There are important characteristics of Desmond et al's (2010) study and study site that should be noted. Firstly, Indianapolis is a predominantly White city, compared to Milwaukee, which is a majority-minority city (United States Census Bureau, 2020a; United States Census Bureau, 2020b). Additionally, there are significant differences in levels of socioeconomic disadvantage across the two cities. In 2020, approximately 16.9% of residents within Indianapolis were below the poverty line, with 25.1% of Black and African Americans being below the poverty line (United States Census Bureau, 2020c). In contrast, 24.6% of Milwaukee residents were below the poverty line in 2020, with this number increasing to 32.6% for Black and African Americans (United States Census Bureau, 2020d). Additionally, while Desmond et al (2010) employ the RELTRAD classification scheme to disaggregate places of worship, they do not examine how the association between places of worship and violent and property crime rates varies by the racial composition of the block group, or by levels of socioeconomic disadvantage. Furthering meso-level analyses at the neighborhood plane within communities situated within different regional, racial, and socioeconomic landscapes is beneficial not only due to the ability for these analyses to observe and capture specific social processes within different communities, but to consider how these specific processes may support or suppress the impact of places of worship on crime rates.

#### Considering the Religion-Race Connection

As noted above, many scholars have examined the association between religion and religious spaces and crime. However, less research has focused on the mechanisms by which race interacts with religious spaces to potentially produce varying effects, especially in highly segregated urban settings. Previous work has sought to examine the role of religion and the

Black church on crime rates within Black communities, finding significant outcomes; for example, while Desmond and colleagues (2010) found Black Protestant congregations to be positively associated with vehicle theft and commercial burglary, Harris and Ulmer (2017) found that Black Protestant adherence was significantly and inversely associated with homicide, robbery, burglary, and larceny, and this association was more pronounced for communities with higher structural disadvantage (Harris and Ulmer, 2017). These findings point to the importance of understanding how race and religion interact to impact social outcomes and the environmental forces that may shape this interaction, which is an understudied portion of the religion-crime literature. Additionally, and more specific to what the current study seeks to account for, Harris and Ulmer's (2017) findings examine this connection on a county level rather than at the local, city level. Understanding the role of religious institutions as structural forces within various racial and socioeconomic neighborhoods can shed light on how these institutions serve as safety nets and grounding pillars for marginalized communities (Barnes, 2005; Dilulio Jr., 2009), which can assist researchers in developing a more comprehensive picture of the roles that religious places of worship take on depending on the demographic makeup and social needs of the community they inhabit.

#### The Significance of the Present Study

As the discussion of relevant literature details, religion and religious institutions have long been placed under sociological and criminological analysis. However, more research is necessary to clarify the linkage between religious institutions and crime. Additionally, more meso- (i.e., neighborhood) level analyses need to be employed to analyze the differing effects religious institutions have depending on the social characteristics that make up their surrounding neighborhood, especially regarding race and socioeconomic status. Examining how religious

institutions interact within neighborhoods of different racial and socioeconomic compositions can draw attention to the mechanisms by which these institutions may serve different roles within the context of community sustainability.

The current study seeks to contribute to these needs by focusing on places of worship through the implementation of a cross-sectional design implemented at both the census block group and tract-level for the city of Milwaukee, Wisconsin. Milwaukee is a majority-minority Midwest city that currently ranks second in the United States for most segregated cities (Johnson, 2022). Milwaukee is a particularly important site for examination when considering its history with the second Great Migration; while the city's Black population was relatively small during the first wave of migration into northern cities, the second wave resulted in its Black population increasing eightfold between 1940 and 1950 and tripling over the course of 25 years between 1960 and 1985 (Levine and Zipp, 1993). This significant influx was also met with white flight and suburbanization, manifesting in significant neighborhood racial turnover (Borg, 2020; Levine and Zipp, 1993). Economic transitions were also occurring within Milwaukee around this time: factory jobs began drastically declining in quantity after 1960, rates of labor exclusion were high and disproportionately affected Black people during the 1980's, and a third of Milwaukee's inner-city was below the poverty line in 1979 (Levine and Zipp, 1993). Neighborhood institutions, including places of worship, had to decide how to respond to the various issues facing these racially shifting and economically changing neighborhoods, including deciding whether or how to serve non-White populations (Borg, 2020). Borg (2020) describes how churches could either move into a different part of the city or the suburbs, keep their current location, or attempt to integrate, and highlights the different hierarchical authority structures that Protestant and Catholic congregations adhered to which made it easier for Protestant churches to

close or transfer areas. Milwaukee's history provides an important lens that may inform how places of worship function within the city of Milwaukee and affect crime, and how this functioning varies by the racial composition of the community. The results of this study also offer a foundation for investigating the extent to which places of worship within Milwaukee engage with their surrounding communities to enact social control and indirectly impact crime. Accordingly, the present study seeks to examine 1) the association between the quantity of places of worship and rates of property and violent crime in Milwaukee, Wisconsin, 2) the extent to which this association is more pronounced for predominantly Black neighborhoods within Milwaukee, and 3) the extent to which this association is more pronounced for highly disadvantaged predominantly Black neighborhoods.

## Data and Methods

### Data

#### Data Axle Reference Solutions U.S. Business Database

The Data Axle Reference Solutions U.S. Businesses database contains information on more than 16 million businesses within the United States, and includes information regarding their ownership, location, business type, description of franchise, date of existence, hours of operation, and contact information. Business data is collected via a two-stage process; first, telephone directories and new business sources are aggregated to obtain fundamental information about the business (legal name, address, etc.). In the second stage, the data is verified by a verification team who reaches out directly to the businesses via phone. The data within the database is checked monthly for accuracy and quality via proprietary data compilation software. Files within the database are updated twice a month, and records for closed businesses are removed daily. The U.S. Business Database contains approximately 43 million currently

operating businesses and 1.5 million closed businesses.<sup>ii</sup> There are significant methodological benefits to using this database to obtain information on places of worship. Firstly, users can focus their analyses to the local level by obtaining coordinate information for the location of each business, as well as the block group the business is situated within. This geographic specificity addresses concerns with prior research that has predominantly focused on county and macro-level examinations (Harris and Ulmer, 2017; Lee, 2006). Focusing on these larger geographical areas potentially obscures the significant inter-neighborhood variation that occurs within a county, which may reduce the ability to address neighborhood-specific effects and outcomes (Warner and Konkel, 2019). The hyper-segregation of both the city of Milwaukee and the greater Milwaukee metro area, as well as stark contrasts in socioeconomic status within Milwaukee County signal the importance of disaggregating the county and addressing city-level analyses (Johnson, 2022). A limitation to this dataset is that unlike the *Historical U.S. Business* database, this dataset does not provide information as to when and where places of worship moved or closed. As a result, the addresses and locations of the places of worship could only be verified at the time of data collection.<sup>iii</sup> Places of worship whose presence at a specific address could not be verified were cross-checked with available google maps images using the “see more dates” function. If the place of worship could be verified by external markings as existing at some point between 2016 and 2020 (to match the range for the census and crime data), it was retained in the sample.

#### United States Census Tract, Wisconsin Block Group, and Milwaukee Polygon Shapefiles

To properly attach places of worship and census data to Milwaukee block groups and census tracts, three additional shapefiles were employed: a Wisconsin census block group shapefile, which displays all census block groups in Wisconsin, a United States census tract

shapefile, which delineates all census tract boundaries within the United States, and a Milwaukee polygon shapefile, which provides a geometric display of the shape of Milwaukee that fits these census tract boundaries. Both a tract and block group shapefile were employed to construct two separate datasets for both units of analysis. The United States census tract and block group shapefiles were sourced from the IPUMS National Historic GIS (NHGIS) data portal, rather than the United States Census Bureau's main data portal.<sup>iv</sup> This is because the IPUMS NHGIS data portal provides GISJOIN codes within their data files that allows for census tract variable data to be joined to census tract shapefile data via a common attribute, which includes the state and county FIPS codes, tract codes, and, for the block group shape file, the block group number.<sup>v</sup>

#### United States Census Bureau American Community Survey

Information for all other independent variables was retrieved from the United States Census Bureau American Community Survey (ACS) through the IPUMS NHGIS data portal so that GISJOIN codes were attached. ACS provides information for demographic, social, community, and housing estimates for the entire United States population.<sup>vi</sup> The ACS response rate for the state of Wisconsin was 77.7% in 2020.<sup>vii</sup> Census tracts that were not a part of the city of Milwaukee were dropped from the analysis.<sup>viii</sup> Census tracts that were along the lakefront, specifically the portions that are north of the Kinnikinic and Menomonee rivers, and census tracts that did not include a residential population (tracts 9800 and 2004) were removed from the analysis.<sup>ix</sup> Block groups that were a part of excluded and non-Milwaukee tracts were also removed from the analysis. Accordingly, a total of 209 census tracts and 566 block groups representing the city of Milwaukee were identified. Selected ACS data were constructed into block group-level and tract-level variables via the construction of two separate datasets. These variables are discussed in detail in the methodology section.

## Milwaukee Wisconsin Incident-Based Reporting Historical Crime Data

The Milwaukee Wisconsin Incident-Based Reporting Historical Crime Dataset is an open-access dataset comprised of Group A incident-level data, which is data on “offenses that are reportable regardless of an arrest” (Wisconsin Department of Justice, 2020, p. 3). Defined by the codes of the Wisconsin Incident-Based Reporting system, the dataset is overseen by the City of Milwaukee and Milwaukee Police Department. The data reflects when a police report was made about a crime that has occurred, and each crime is coded via dummy variable notation into specific types, including arson, assault offenses, criminal damage, homicide, locked vehicles, robbery, sex offenses, theft, and vehicle theft. Limitations to this dataset should be noted; not all counts of crime included in this dataset are assigned to a tract in which they occurred, and information for an incident may reflect where the incident was reported, rather than where the incident occurred. However, the accessibility of this data file as open access makes it the most suited for constructing this dataset. The historical dataset contains information for all counts of crime prior to the present year. It was then queried for this analysis to only include data for the year range of March 2017 to February 2020. The reasoning for this specific range follows Harris and Ulmer (2017) and Shihadeh and Barranco (2010), who note that averaging counts of crime across a three-year period ensures “adequate offense counts for statistically rare offenses” (Harris and Ulmer, 2017, p. 301), and provides more analytical stability. The March 2017 and February 2020 ensures that 36 months of crime, or 3 years, of crime data are included in the dataset. The reasoning for the specific end cutoff is to account for the effects of the COVID-19 Pandemic beginning in March of 2020, which significantly reduced the capacity and sustainability of many institutions and may not provide comprehensive or reliable estimates of the relationship between places of worship and crime under more typical circumstances. Therefore, March 2017 and

February of 2020 were chosen as cutoffs to ensure as much data prior to the COVID-19 Pandemic was included while still attending to the three-year range. To properly join the crime incident addresses to the census block group-level and categorize any crimes that possessed an address but were not reported to a specific census tract, the crime dataset was geocoded in ArcGIS. A total of 106,937 crime incident addresses were geocoded. 2,635 cases were dropped due to these cases being sex offenses, which do not have addresses attached to them to protect the victim. 318 cases were deleted for having an address that is outside of Milwaukee or unable to be located. 278 cases were dropped due to no addresses being assigned to them or the address being reported as unknown. 345 cases were matched with addresses tied to multiple locations and were then hand-matched to attach the cases to the correct address. Cases occurring at an intersection were handled by numbering each side of the intersection and using a random number generator to randomly assign the case to a side of the intersection. Of these 345 cases, 319 were successfully hand matched, with 26 cases being dropped due to them being inaccurate addresses or lying outside of the city of Milwaukee's boundaries. Two dummy variables were created to sort the types of crime within the dataset into two main categories of violent and property crime, as categorized by the National Institute of Justice (NIJ).<sup>x</sup> After attaching the crime data to the census tract and block-group shapefiles, an additional 98 crimes were dropped that did not fall within Milwaukee city block groups and census tracts. After performing this data cleaning, a total of 103,582 crimes remained in the dataset. 2,676 incidents were not given a value indicator for property or violent crime because they were listed as being more than one type of crime (i.e., assault offense and criminal damage). These cases were excluded from the analysis. As a result, 39,908 crimes qualified as violent, and 60,997 qualified as property.

## Methods

### Focal Independent Variables

The focal independent variables for this study include an aggregated measure for places of worship, a disaggregated measure for places of worship, a dummy variable indicator for predominantly neighborhoods (at the census tract and block group levels), and an index measure for neighborhood disadvantage. For the tract-level dataset, the places of worship variables were constructed as a rate by totaling the number of places of worship (both aggregately and by type) that fell into each census tract, dividing by the total tract population, and multiplying by 1,000 to retrieve the number of places of worship per 1,000 people (the mean tract population count is 2,837 people per tract). The same process was repeated for the block group-level dataset, and the same denominator of 1,000 residents was used, since the mean block group population count is 1,047 residents per block group. The dummy variable indicating whether the neighborhood is predominantly Black utilized a 70% threshold for Black residential occupancy (see Peterson and Krivo, 2010), and was created by assigning tracts and block groups with a percentage of Black residents of at least 70% a value of 1, and tracts and block groups with a percentage of Black residents less than 70% a value of 0. The focal variable of neighborhood's disadvantage was created as an index via Principal Components Analysis and is discussed in detail with the control variables.

This set of three models were replicated with a disaggregated measure of places of worship, following a variation of the RELTRAD categorization scheme (Steenland et al 2000; Woodberry et al, 2012; Shelton and Cobb, 2017). This disaggregated measure classified places of worship in Milwaukee into 8 categories: Catholic, Jewish, Black Protestant, Mainline Protestant, Evangelical Protestant, Mormon, Non-Denominational, and Other. Each variable was

divided by the total block group and tract populations and multiplied by 1,000. The RELTRAD classification process is discussed in detail below.

## RELTRAD

To distinguish between the religious traditions of places of worship, I utilized an expanded version of the RELTRAD syntax system (Steenland et al, 2000; Woodberry et al, 2012). Developed for the purpose of increasing the accuracy of classifying individuals into different religious groups for survey research, RELTRAD relies on denominational affiliation to sort respondents into a seven-category scheme: Catholic, Jewish, Black Protestant, Mainline Protestant, Evangelical Protestant, Other, and None/Unaffiliated (Steenland et al, 2000). Woodberry and colleagues (2012) suggest further developments of this classification scheme, including 1) focusing more attention on individuals who fall into non-denominational or non-specific denominational categories and 2) developing a separate category for Mormons. More recently, Shelton and Cobb (2017) advanced a ‘Black RELTRAD’ classification scheme, in which they distinguished “between traditional and nontraditional liberal and conservative Protestant affiliations with roots inside and outside of the Greater Black Church” (p. 741) and accounted for the growing presence of nondenominational Black Protestants within this system by creating a separate non-denominational category. It is important to note that these RELTRAD syntax systems were created for surveys (specifically constructed for the General Social Survey) and are utilized to measure the religious tradition statuses of individual respondents. Because this project is specifically interested in the presence and spatial distributions of places of worship in relation to neighborhood crime rates, this study does not measure individual levels of religiosity or religious attendance within and across Milwaukee neighborhoods. This project is also unable to measure the racial compositions of the congregations that these places of worship serve.

However, the RELTRAD syntax system on a macro-level can be employed to disaggregate places of worship by their religious traditions, identify the types of places of worship that are present within different Milwaukee neighborhoods, and examine the extent to which different types of places of worship are associated with different crime rate outcomes.

Accordingly, I employed the original coding scheme developed by Steensland and colleagues (2000) as well as suggestions by Woodberry et al (2012) and Shelton and Cobb (2017) to create an eight-category RELTRAD system for places of worship: Catholic, Jewish, Black Protestant, Mainline Protestant, Evangelical Protestant, Mormon, Non-Denominational, and Other. This version of RELTRAD addresses the need for Mormon churches to have their own category rather than being coded as “Other” (Steensland et al, 2000; Woodberry et al, 2012), as well as the importance of more accurately categorizing churches that do not specify their Protestant denomination or self-identify as non-denominational (Shelton and Cobb, 2017; Woodberry et al, 2012), which were originally grouped into the Evangelical Protestant category by Steensland and colleagues (2000). These additions decrease the ambiguity and potential inflatedness of the Evangelical Protestant and “Other” categories.<sup>xi</sup>

Protestant churches that explicitly identified as being non-denominational on their social media platforms or in the title of their name were then cross-referenced with their franchise description codes, as available on Data Axle. Non-denominational churches that possessed a franchise description that fell into one of the Protestant denomination categories were then coded as being a part of that denomination. Non-denominational churches that did not report a franchise description were then placed in the non-Denominational category. If the church identified as non-denominational but was listed as Christian within the franchise description, it was coded as non-denominational. This process was repeated for churches who were not

connected to a broader denominational organization, did not report a specific Protestant denomination on any social media platforms, and whose denomination could not be categorized by the name of the church.

Steensland and colleagues (2000) place Baptist churches as classifiable under both the Black Protestant denomination and the Evangelical Protestant denomination. For churches whose denomination or franchise description is listed as Baptist, a first attempt was made to examine if the Baptist church was a part of a larger national congregation that aligned with Steensland et al (2000), such as American Baptist Churches in the USA, Southern Baptist Convention, and National Baptist Convention of America. For Baptist churches that could not be connected to a larger organization and still needed to be categorized, the neighborhoods in which these places of worship were housed were then examined for their racial composition. The logic behind this choice was to use the neighborhood racial composition to serve as a proxy for the congregation's racial composition, though it is important to note that this way of analyzing places of worship does have its limits, specifically because there is an increasing number of individuals who attend churches outside of their home neighborhoods (see Dougherty and Mulder, 2020). However, this method provides a way to navigate the RELTRAD classification scheme to minimize the likelihood of misclassifying Baptist churches as Black Protestant or Evangelical Protestant and potentially inflating one category or the other. Additionally, Black Protestants tend to be much more engaged within their communities, participate in outreach towards underprivileged populations, and “remain culturally tied to the inner city” (Desmond et al, 2010; see also Lincoln and Mamiya, 1990). Therefore, Baptist churches not connected to a larger Baptist organization as outlined by Steensland et al (2000) were categorized based on the racial composition of their neighborhood, specifically the percentage of the population that is Black. In following Peterson

and Krivo's (2010) 70% majority threshold, Baptist churches with a Black population of 70% or more were categorized as Black Protestant Baptist churches, and Baptist churches with a Black population of less than 70% were categorized as Evangelical Protestant Baptist churches.

Alternate Evangelical and Black protestant measures were also constructed to alternatively code Baptist churches within Black neighborhoods that were not explicitly affiliated with larger Black Protestant organizations as Evangelical, rather than Black Protestant, and to alternatively only code churches explicitly affiliated with a Black Protestant organization as Black Protestant.

These additional models are available upon request. A total of 654 places of worship were retrieved from the Data Axle Reference Solutions U.S. Business Database. 201 observations were removed from the analysis due to them either not being present at the address when located, being a duplicated business already accounted for, unable to be located, not in Milwaukee, or not being an actual place of worship. After the dataset was cleaned, 453 places of worship remained. The types of Milwaukee places of worship and their totals according to the RELTRAD scheme is as follows: Catholic (50), Jewish (6), Black Protestant (113), Mainline Protestant (60), Evangelical Protestant (174), Mormon (2), Non-Denominational/No Denomination Specified (30), and Other (18).

#### Dependent Variables

The two focal dependent variables of property and crime rates represent the number of property and violent crimes in each census tract divided by the total tract population and multiplied by 1,000. Both types of crime were analyzed in separate models. Crimes classified as property crimes included arson, burglary, criminal damage, locked vehicles, theft, and vehicle theft. Crimes classified violent crimes included assault offenses, homicide, and robbery.

## Control Variables

To account for different neighborhood processes that may influence the relationship between places of worship and crime within different neighborhoods, several control variables were used for this analysis. All control variables were derived from the 2016-2020 American Community Survey (ACS). I follow similar previous research (Harris and Ulmer, 2017; Peterson and Krivo, 2010; Warner and Konkel, 2019) in creating neighborhood index measures and specific controls. Principal Components Analysis was employed for the index measures to address high collinearity between many of the variables, which risks increasing sampling variance and reducing the stability of the estimated coefficients (Britton, 2022, 982 OLS 2 Lecture). The way the variables are accounted for in each model and index vary at the block group and tract level based on how well each observed variable explained the variance in each item, as well as the extent to which multicollinearity is present and/or needed to be addressed.

### *Block-Group Level Dataset*

Neighborhood disadvantage and immigration index measures were employed for the block group dataset. Both indexes were created via principal components analysis. For the disadvantage index, the overall Cronbach's alpha was 0.87, which surpasses the threshold of 0.7. Component 1 was the only component with an eigenvalue greater than 1 (3.30) and explained 66% of the variance in the observed variables (0.661). All the eigenvectors were positively correlated for component 1, signaling its suitability as a measure of neighborhood disadvantage. The variables utilized for this measure along with their principal component loadings include Black residence (percentage of Black residents; 0.78), poverty (percentage of residents below the poverty line; 0.77), public assistance (percentage of residents receiving public assistance income or food stamps; 0.88), limited education (percentage of individuals 25+ without a bachelor's

degree; 0.78), and female-headed households (percentage of family households that are female headed with no spouse present; 0.85).

The immigration index's overall Cronbach's alpha was 0.89, significantly surpassing the 0.7 threshold. Only component 1 had an eigenvalue over 1 (2.46), and this component explained 82% of the variance in the observed variables. All the eigenvectors were positively correlated for component 1, signaling their appropriateness as a measure of immigration at the neighborhood level. The variables included and their principal component loadings were immigrant residence (percentage of non-native born residents; 0.89), limited English speaking (percentage of limited English-speaking residents; 0.91), and Hispanic residence (percentage of Hispanic residents; 0.92). Other individual and household-level demographic variables employed include gender (percent male), other race variables not included in the disadvantage and immigration indexes (percentages of non-Hispanic Asian and Other racial groups), younger population (percentage of the population 16-19 years of age), senior population (percentage of the population 65 years and older), renter-occupied households (percentage of renter-occupied housing units), residential tenure (the percentage of residents who have lived in their household since 2015 or earlier), and unemployment (percentage of residents 16 years or older who are in the labor force but are not employed).

#### *Tract-Level Dataset*

For the tract-level dataset, a neighborhood disadvantage index and an immigration index were constructed to be used for the models, though they differed slightly in their components compared to the block group dataset. Both indexes were created via principal components analysis. The overall Cronbach's alpha for the disadvantage index was 0.90, which surpasses the threshold of 0.7. The first component was the only component with an eigenvalue greater than 1

(4.06) and explained about 67.7% of the total variance in the observed variables. Again, all the eigenvectors were positively correlated with component 1. The variables used to construct the neighborhood disadvantage index at the tract-level and their principal component loadings include poverty (percentage of residents below the poverty line; 0.78), female headship (percentage of family households that are female-headed with no spouse present; 0.90), public assistance (percentage of individuals receiving public assistance income or food stamps; 0.92), limited post-secondary education (percentage of residents 25+ without a bachelor's degree; 0.79), Black residence (percentage of Black residents; 0.81), and unemployment (unemployment (percentage of residents 16 years or older who are in the labor force but are not employed; 0.72).<sup>xii</sup>

The overall Cronbach's alpha for the immigration index was 0.9352, which significantly surpasses the 0.7 threshold. Only the first component had an eigenvalue greater than 1 (2.65) and explained 89% of the variance in the observed variables. All eigenvectors were positively correlated with component 1. The variables included and their principal component loadings were immigrant residence (percentage of non-native born residents; 0.92), limited English speaking (percentage of limited English-speaking residents; 0.96), and Hispanic residence (percentage of Hispanic residents; 0.94). Other individual and household-level demographic variables employed include gender (percent male), other race variables not included in the disadvantage and immigration indexes (percentages of non-Hispanic Asian and Other racial groups), younger population (percentage of the population 16-19 years of age), senior population (percentage of the population 65 years and older), renter-occupied households (percentage of renter-occupied housing units), and residential tenure (the percentage of residents who have lived in their household since 2015 or earlier).

## Missing Data

Two Milwaukee city block groups were missing data for the percentage of family households that were female-headed, which is a key variable for the neighborhood disadvantage index. Since these two block groups only accounted for 0.3% of the cases (2/566) and 0.03% of the crimes (41/103,582), these two block groups were removed from the block group dataset, bringing the total from 566 to 564 block groups. As a result, the number of places of worship reduced from 453 to 452, and the number of crimes reduced from 103,582 to 103,541 for the block group dataset. The tract-level dataset was left unchanged (453 places of worship, 209 tracts, and 103,582 total crimes).

## Analytic Strategy

### *Models*

The first set of models tests the first, third, and fourth hypotheses with violent crime as the outcome variable and the aggregate places of worship independent variable, along with all controls. To test the first hypothesis that there will be a negative association between places of worship and rates of violent and property crime, model 1 regresses violent crime rate on the rate of places of worship (aggregated) and all control variables. To test the third hypothesis that the association between places of worship (aggregated) and violent and property crimes will be more pronounced for predominantly Black neighborhoods, model 2 regresses violent crime rate on an interaction between places of worship (aggregated) and a predominantly Black neighborhood indicator variable and includes all control variables in the regression. To test the fourth hypothesis that the association between places of worship and violent and property crimes will be more pronounced for predominantly Black disadvantaged neighborhoods, model 3 regresses violent crime rate on an interaction between the rate of places of worship (aggregated) and a

predominantly Black neighborhood indicator variable and limits the model's sample to neighborhoods whose disadvantage score is at or above the mean. The second set of models (models 4, 5, and 6) repeats this entire process with property crime as the outcome variable.

The third set of models (models 7, 8, and 9) replicates the first set of models predicting violent crime but utilizes the disaggregated measure of places of worship (RELTRAD) instead of the aggregated measure. Doing so allows the second hypothesis – that Catholic churches will be negatively associated with rates of violent and property crime – to be tested. The fourth set of models (models 10, 11, and 12) replicates the second set of models predicting property crime, also utilizing the disaggregated measure of places of worship.

#### *Spatial Autoregressive (SAR) Modeling*

Construction of the dataset was performed via ArcGIS and Stata 16.1 Software. All statistical analyses were performed using Stata 16.1. Spatial Autoregressive (SAR) models were employed for this analysis since the variables applied in this analysis have geographic and spatial impacts. One of the fundamental assumptions of Ordinary Least Squares (OLS) regression is that the error terms are uncorrelated (Hanushek and Jackson, 1977). Research has demonstrated that crime is indeed clustered and spatially autocorrelated (Baller et al, 2001; Balocchi and Jensen, 2019), and units that are geographically closer to each other tend to be more similar than units that are further apart (Beale et al, 2010). To account for and address regression assumption violations, SAR models allow for a linear regression to be fit with spatial lags and autoregressive errors of the independent and/or dependent variable(s) and accounts for how outcomes in one area may be affected by the outcomes, covariates, and errors in nearby areas (StataCorp, 2021). Choropleth maps of property and violent crime rates were constructed to examine the distribution of crime rates and neighborhood disadvantage across the city of Milwaukee and are

in **Appendix A**. Visual results demonstrated that block groups and tracts with similar rates of property and violent crimes, as well as similar levels of disadvantage, tended to cluster together, further suggesting spillover effects between geographical units. Prior to implementing the SAR models, a Moran's test was performed on the focal and control variables within a standard OLS regression model. The Moran's test results were statistically significant for these regression models, indicating that spatial autocorrelation was indeed present and that it was appropriate to move forward with the SAR model method. A Breusch Pagan Test was also performed on the standard OLS regression models to test for heteroskedasticity of the error terms. The test results were statistically significant, indicating that heteroskedasticity was present. Heteroskedasticity risks the validity of significance tests such as T-tests because the regression coefficients and the variance of the error terms (and corresponding covariance matrix) are inconsistent (Britton, 2022, 982 OLS 2 Lecture). Accordingly, the 'heteroskedastic' option was specified in the spatial autoregressive models to ensure that Stata accounted for the heteroskedasticity of the error terms.

## Results

### Block Group Analyses

#### Block Group Descriptive Statistics

Descriptive statistics for the block group dataset are listed in **Table 1**. The mean number of places of worship per block group is 0.801, and the mean rate of places of worship per 1,000 people is 0.951. Black Protestant and Evangelical Protestant places of worship have similar rates (0.302 and 0.331, respectively). Catholic churches have an average rate of 0.083, and Jewish places of worship have a smaller rate of 0.01. The mean rate of non-denominational churches is about 0.061, and Mormon churches have the smallest rate (0.002). Places of worship that fall into the "Other" category have a rate of 0.032. The average percentage of Black residents within

a block group hovers at 42%, though the maximum reaches 100%. No other racial group constitutes 100% of any block group's population. White residents make up about one-third (32.5%) of block group populations on average, with Hispanic residents constituting about 18% (17.8%). Asian residents and residents from other racial groups constitute about 4.2% and 6.5% of block group populations, respectively. The mean rate of violent crimes is about 81 per 1,000 people, and the mean rate of property crimes is about 116 per 1,000 people. Young residents (residents aged 24 and under) and Senior residents (residents aged 65 and over) make up an average of 37% and 11% of block group populations, respectively. About 7% of residents are unemployed on average, and the mean percentage of renters sits at about 59%. Approximately 1 in 4 (25%) of individuals are under the poverty line, and about 30% receive public assistance income or food stamps. The average percentage of residents without a bachelor's degree is slightly over 3/4ths (77%), and approximately 9% of residents are immigrants. The mean percentage of individuals who speak limited English within a block group hovers around 5%, and approximately 40% of residents live in female-headed family households. Male residents make up about 48% of a block group's population on average.

**Table 2** lists the total quantities of the places of worship in the dataset by their type, totaling 452. Evangelical Protestant congregations constitute most of the places of worship within the dataset (174), followed by Black Protestant (113), Mainline Protestant (60), Catholic (49), non-denominational (30), Other (18), Jewish (6), and Mormon (2). **Table 3** lists the number of block groups whose population is predominantly (70% or more) of one racial category: Black, White, Asian, Hispanic, or Other race. Predominantly Black block groups are most common

**Table 1: Descriptive Statistics for Block Group Variables**

Variable	Obs	Mean	Std. Dev.	Min	Max
Worship	564	.801	1.183	0	11
Worship Rate	564	.951	1.736	0	20
Catholic	564	.087	.344	0	4
Catholic Rate	564	.083	.414	0	5.714
Jewish	564	.011	.119	0	2
Jewish Rate	564	.01	.127	0	2.296
Black Protestant	564	.2	.572	0	4
Black Protestant Rate	564	.302	.983	0	11.429
Mainline Protestant	564	.106	.412	0	5
Mainline Protestant Rate	564	.13	.56	0	6.596
Evangelical Protestant	564	.309	.617	0	4
Evangelical Protestant Rate	564	.331	.72	0	6.173
Mormon	564	.004	.059	0	1
Mormon Rate	564	.002	.04	0	.871
Non-Denominational	564	.053	.24	0	2
Non-Denominational Rate	564	.061	.306	0	2.845
Other	564	.032	.186	0	2
Other rate	564	.032	.213	0	2.857
% Black	564	41.86	36.703	0	100
% White	564	32.509	30.423	0	98.207
% Hispanic	564	17.812	24.371	0	91.391
% Asian	564	4.23	8.292	0	66.709
% Other Race	564	6.511	9.096	0	83.937
% Young	564	36.836	13.576	0	91.169
% Senior	564	10.933	8.39	0	56.703
% Unemployed	564	7.31	7.258	0	40.896
% Renter	564	58.706	22.786	0	100
% Poverty	564	24.75	16.567	0	78.723
% Public Assistance or Food Stamps	564	29.828	20.44	0	86.017
% No Bachelor's Degree	564	77.37	20.119	11.825	100
% Immigrant	564	9.309	10.868	0	55.058
% Limited English	564	4.71	8.397	0	54.447
% Female-Headed Family Households	564	39.55	24.438	0	100
% Male	564	48.134	7.996	7.746	75.751
Violent Crimes	564	70.736	49.205	1	247
Property Crimes	564	108.103	75.106	9	649
Violent Crime Rate	564	80.724	67.643	2.114	376.344
Property Crime Rate	564	115.947	79.657	9.231	696.429

(183), followed by predominantly White block groups (107), and predominantly Hispanic block groups (48). Only 1 block group is comprised mainly of residents of other racial groups, and no block groups is predominantly comprised of Asian residents.

**Table 4** lists the summary statistics for the index measures of neighborhood disadvantage (% Black residence, % poverty, % public assistance, % limited education, % female-headed households), and immigration (% immigrant residence, % limited English-speaking, % Hispanic residence). The mean score for neighborhood disadvantage is 0, with a minimum of -3.811, maximum of 3.901, and standard deviation of 1.817. Approximately 298 of block groups, or 53%, have levels of disadvantage that are higher than the mean. These statistics can be confirmed and spatially examined via a choropleth map distribution of neighborhood disadvantage, located in **Appendix A**; higher levels of disadvantage are more concentrated on the north and northwest sides of Milwaukee. The mean score for neighborhood immigration is also 0, with a minimum of -1.239, maximum of 6.11, and standard deviation of 1.569. Approximately 155 of block groups, or 27%, have levels of immigration that are higher than the mean. Choropleth maps of the distribution of immigration in the city of Milwaukee demonstrate block groups with higher levels of immigration are clustered on the south side of Milwaukee. This map is also located in **Appendix A**.

#### Block Group-Level SAR Models Predicting Violent Crime on Aggregated Places of Worship

SAR models predicting violent crime on the aggregate measure of places of worship and all controls are included in **Table 5**. The first model does not provide support for the prediction of a negative association between places of worship and crime. In the first model, the coefficient for places of worship is positive and significant; as the number of places of worship per 1,000

**Table 2: Total Places of Worship, Aggregate and by Type**

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	Total
Total Places of Worship	452
Catholic	49
Jewish	6
Black Protestant	113
Mainline Protestant	60
Evangelical Protestant	174
Mormon	2
Non-Denominational	30
Other	18

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**Table 3: Block Groups Predominantly (70% or more) Comprised of 1 Racial Group**

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	Total
Black Block Group	183
White Block Group	107
Hispanic Block Group	48
Asian Block Group	0
Other Race Block Group	1

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people increases by 1, the number of violent crimes per 1,000 people increases by about 3.6, holding all other variables constant. This finding holds limited substantive significance since the average rate of property crimes for block groups is approximately 116 per 1,000 people, and the average rate of places of worship is 0.95 per 1,000 people. The coefficient for disadvantage is also positive and statistically significant; as the score of disadvantage increases by 1 point, the number of violent crimes per 1,000 people increases by about 15.2, holding all other variables constant. The percentage of young individuals is significantly and inversely associated with violent crime rates (-.782), and the percentage of renters is positively and significantly associated with violent crime rates (0.262). However, neither of these results are large enough to hold substantive significance, especially considering the average percentage of young residents (36.9%), the average percentage of renters (58.7%), and the average block group violent crime rate (80.724). The percentage of senior residents is also significantly and inversely associated with violent crime rates (-.593), but again, is not large enough to demonstrate substantive significance when considering the average percentage of senior residents (11%). The coefficients for immigration, Black neighborhoods, the percentage of Asian residents, the percentage of residents of other races, the percentage of male residents, the percentage of residents living in their neighborhoods for five years or more, and the percentage of unemployed individuals are not statistically significant. The significance and direction of these coefficients do not change in the second model, which incorporates an interaction between the rate of places of worship per 1,000 people and Black neighborhoods. The worship rate x Black neighborhood interaction coefficient is positive (2.145), but not statistically significant, and subsequently does not support the third hypothesis that the association between places of worship and crime will be more pronounced for predominantly Black neighborhoods, compared to predominantly non-Black neighborhoods.

**Table 4: Block Group Summary Statistics for Neighborhood Disadvantage and Immigration Index Measures**

<b>Descriptive Statistics for Disadvantage Index Measure</b>					
Variable	Obs	Mean	Std. Dev.	Min	Max
Disadvantage	564	0	1.817	-3.811	3.901

<b>Block Groups with Levels of Disadvantage Greater than the Mean</b>					
Variable	Obs	Mean	Std. Dev.	Min	Max
Disadvantage	298	1.464	.96	.005	3.901

<b>Descriptive Statistics for Immigration Index Measure</b>					
Variable	Obs	Mean	Std. Dev.	Min	Max
Immigration	564	0	1.569	-1.239	6.11

<b>Block Groups with Levels of Immigration Greater than the Mean</b>					
Variable	Obs	Mean	Std. Dev.	Min	Max
Immigration	155	2.129	1.555	.003	6.11

Model 3 shows the three-way interaction (worship rate x Black neighborhood x disadvantage) and tests the fourth hypothesis that the association between places of worship and crime rates will be more pronounced for socioeconomically disadvantaged predominantly Black neighborhoods than for other neighborhoods, including less disadvantaged predominantly Black ones. Interestingly, the three-way interaction coefficient is negative and significant (-3.717). This coefficient can be better understood by examining the additional two-way interaction coefficient reproduced in model 3 (9.413). When disadvantage is set to 0, Black neighborhoods experience an increase in violent crime rates of about 9.4 per 1,000 people as the number of places of worship increases per 1,000 people. However, predominantly Black neighborhoods who experience a 1 unit increase in disadvantage also experience a decrease in violent crimes per 1,000 people of about 3.7 as the number of places of worship per 1,000 people increases. In adding this coefficient to the two-way interaction coefficient for places of worship and Black neighborhoods, standalone coefficient for places of worship, and two-way interaction coefficient for places of worship and disadvantage ( $2.254 + 9.413 + (-0.07) + (-3.717) = 7.88$ ), it can be concluded that while highly disadvantaged Black neighborhoods experience a positive

association between places of worship and violent crime, this association is significantly weaker for Black neighborhoods with higher levels of disadvantage. In other words, the magnitude of the impact of places of worship on violent crime rates in Black neighborhoods changes depending on the level of disadvantage within the Black neighborhood. **Figure 1**, located in **Appendix B**, displays this relationship visually; as the number of places of worship per 1,000 people increases, Black neighborhoods with low levels of disadvantage experience a stark increase in the number of violent crimes per 1,000 people. This association is much weaker for Black neighborhoods with high levels of disadvantage. The value of the spatial autocorrelation parameter for the dependent variable of violent crime rate in each of these models is large, positive, (between .51 and .53), and statistically significant. The values of the spatial autocorrelation parameter for the spatial autoregressive error terms of violent crime rate are negative, large (between -.45 and -.42) and statistically significant. The Wald tests of these spatial terms were statistically significant across all three models.

#### Block Group-Level SAR Models Predicting Property Crime on Aggregated Places of Worship

SAR models predicting property crime on an aggregated measure of places of worship are listed in **Table 6**. Like the violent crime model, the first model does not provide support for the first hypothesis. The coefficient for the rate of places of worship is positive and statistically significant (3.945); as the number of places of worship per 1,000 people increases by 1, the number of property crimes per 1,000 people increases by about 4. It is important to substantively contextualize this finding since the average rate of property crimes for block groups is approximately 116 per 1,000 people, and the average rate of places of worship is 0.95 per 1,000 people. Unlike the SAR models predicting violent crime on aggregated places of worship,

**Table 5: SAR Models Predicting Violent Crime at the Block Group Level**

	(1) Violent Rate	(2) Violent Rate	(3) Violent Rate
Worship Rate	3.621** (1.115)	2.27* (1.07)	2.254 (1.696)
Disadvantage	15.209*** (2.17)	15.163*** (2.171)	14.856*** (2.279)
Immigration	-.319 (1.322)	-.403 (1.326)	-.219 (1.367)
Black Neighborhood	.747 (7.383)		
% Asian	.012 (.199)	.013 (.199)	.039 (.199)
% Other	-.063 (.215)	-.048 (.215)	-.014 (.222)
% Young	-.782*** (.177)	-.766*** (.178)	-.752*** (.18)
% Male	.33 (.281)	.322 (.281)	.371 (.277)
% Senior	-.593* (.278)	-.585* (.276)	-.569* (.273)
% 5+ Year Tenure	-.1 (.29)	-.099 (.29)	-.074 (.292)
% Renter	.262*** (.078)	.272*** (.079)	.267*** (.08)
% Unemployed	-.05 (.324)	-.05 (.324)	-.063 (.318)
Black Neighborhood		-1.316 (7.614)	-14.534 (10.437)
Black Neighborhood x Worship Rate		2.145 (2.031)	9.413* (3.825)
Worship Rate x Disadvantage			-.07 (.754)
Black Neighborhood x Disadvantage			8.391 (5.856)
Black Neighborhood x Worship Rate x Disadvantage			-3.717* (1.764)
_cons	51.445 (35.316)	51.457 (35.312)	46.052 (34.85)
W: Violent Rate	.526*** (.051)	.523*** (.051)	.515*** (.05)
W: e.Violent Rate	-.445*** (.119)	-.441*** (.118)	-.418*** (.117)
Observations	564	564	564
Pseudo R <sup>2</sup>	.639	.639	.644

*Standard errors are in parentheses*

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

however, the index measure for disadvantage is not statistically significant and is smaller in magnitude, though it is predicted in the positive direction (3.975). The percentage of young residents is negatively and significantly associated with rates of property crime (-1.322), though may not be large enough to hold substantive significance when considering the average percentage and range of young residents (36.9%; minimum: 0%; maximum: 91%). The percentage of senior residents is negatively and significantly associated with rates of property crime (-1.031) and is large enough to hold substantive significance when considering the average percentage of senior residents (11%). The percentage of renters is positively and significantly associated with rates of property crime (0.541), though this finding is not large enough to hold substantive significance when considering the average percentage and range of renters (58.7%; minimum: 0%, maximum: 100%). The coefficients for immigration, Black neighborhoods, the percentage of Asian residents, the percentage of residents of other races, the percentage of male residents, the percentage of residents living in their neighborhoods for five years or more, and the percentage of unemployed individuals are not statistically significant. The second model tests if the association between places of worship and property crime varies depending on if that block group is predominantly Black and includes an interaction between predominantly Black neighborhoods and places of worship. No significant support for this hypothesis is present. The coefficient for the standalone rate of places of worship per 1,000 people is positive and similar in magnitude to the first model (4.211) but is not statistically significant. The interaction coefficient between predominantly Black neighborhoods and the rate of places of worship per 1,000 people is predicted in the negative direction (-0.503), though this coefficient is small in magnitude and is not statistically significant. The third model examines the extent to which the relationship between places of worship and property crime varies by both the racial composition of the

neighborhood and the neighborhood's levels of socioeconomic disadvantage. In this model, the coefficients are similar in magnitude and significance to the first and second model. The three-way places of worship x Black neighborhood x disadvantage interaction is negative and significant (-5.647). In conceptualizing these effects, the two-way interaction coefficient depicting the interaction between Black neighborhoods and places of worship reproduced in the third model can be referenced (7.897). When adding this to the three-way interaction coefficient, the standalone places of worship coefficient, and the two-way interaction coefficient for places of worship and disadvantage, it can be concluded that the association between places of worship and violent crime slightly but significantly weakens for Black neighborhoods with higher levels of disadvantage ( $5.14 + 7.897 + (-5.647) + 0.822 = 8.212$ ). This finding is visually depicted in **Figure 2 in Appendix B**; while highly disadvantaged Black neighborhoods with zero places of worship have higher rates of property crime, this rate decreases as the number of places of worship per 1,000 people increases. Conversely, Black neighborhoods with low levels of disadvantage experience an increase in violent crimes as the rate of places of worship increases. The value of the spatial autocorrelation parameter for the dependent variable of property crime rate in each of these models is large, positive, (between .65 and .67) and statistically significant. The value of the spatial autocorrelation parameter for the spatial autoregressive error terms of property crime rate are negative, moderate (between -.4 and -.35) and statistically significant. The Wald tests of these spatial terms were statistically significant across all three models.

**Table 6: SAR Models Predicting Property Crime at the Block Group Level**

	(1) Property Rate	(2) Property Rate	(3) Property Rate
Worship Rate	3.945* (1.576)	4.211 (2.39)	5.14 (2.98)
Disadvantage	3.975 (2.866)	3.936 (2.91)	2.744 (3.344)
Immigration	-.574 (1.699)	-.531 (1.69)	-.304 (1.813)
Black Neighborhood	-1.902 (9.026)		
% Asian	-.204 (.252)	-.208 (.252)	-.177 (.261)
% Other	-.016 (.353)	-.016 (.354)	-.013 (.388)
% Young	-1.322*** (.285)	-1.319*** (.285)	-1.303*** (.284)
% Male	.304 (.416)	.297 (.417)	.354 (.407)
% Senior	-1.031** (.395)	-1.025** (.394)	-1.023** (.392)
% 5+ Year Tenure	-.783 (.687)	-.779 (.684)	-.771 (.689)
% Renter	.541*** (.144)	.53*** (.146)	.533*** (.148)
% Unemployed	-.082 (.441)	-.081 (.441)	-.091 (.438)
Black Neighborhood		-1.544 (9.193)	-18.523 (12.493)
Black Neighborhood x Worship Rate		-.503 (3.2)	7.897 (4.217)
Worship Rate x Disadvantage			.822 (1.455)
Black Neighborhood x Disadvantage			11.763 (7.063)
Black Neighborhood x Worship Rate x Disadvantage			-5.647** (2.033)
_cons	131.458 (79.202)	130.683 (78.843)	126.659 (77.853)
W: Property Rate	.66*** (.06)	.67*** (.062)	.652*** (.064)
W: e.Property Rate	-.383** (.143)	-.397** (.144)	-.35* (.144)
Observations	564	564	564
Pseudo R <sup>2</sup>	.34	.34	.344

*Standard errors are in parentheses*

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

## Block Group-Level SAR Models Predicting Violent Crime on RELTRAD Measure of Places of Worship

SAR models predicting violent crime rates on the disaggregated RELTRAD measure of places of worship are listed in **Table 7**. Differences in the direction of the places of worship-crime association are evident, providing mixed support for the first hypothesis that places of worship are negatively associated with violent crime. In the first model, the coefficient for the rate of Catholic places of worship per 1,000 people is negative and significant (-14.19); as the number of Catholic churches per 1,000 people increases by 1, the number of violent crimes per 1,000 people decreases by about 14, holding all other variables constant. This finding supports the second hypothesis of a negative association between Catholic churches and crime. This finding is large enough to hold substantive significance when considering the mean rate of violent crimes in a block group per 1,000 people (about 80.7), though it is important to note that the mean number of Catholic churches per 1,000 people is low (.083). Results differ across Christian denominations; Black Protestant and Mainline Protestant churches are positively and significantly associated with rates of violent crime: as the number of Black Protestant and Mainline Protestant churches per 1,000 people increases by 1, the number of violent crimes per 1,000 people increases by 8.9 and 8.7, respectively, holding all other variables constant. These coefficients have a moderate magnitude and possess substantive significance, though it is important to consider that the mean number of Black Protestant and Mainline Protestant churches per 1,000 people is .302 and .16, respectively. The coefficients for Evangelical Protestant churches (.79), Jewish congregations (6.21), and other congregations (6.30) are positive but not statistically significant. The coefficients for Mormon (-5.82) and non-denominational Protestant churches (-1.69) are negative but not statistically significant. The

coefficient for disadvantage is large, positive, and statistically significant (15.41); as levels of disadvantage in a block group increase by 1 point, the number of violent crimes per 1,000 people increases by 15.41, holding all other variables constant. This is large enough to hold substantive significance, especially considering the descriptive statistics for violent crime, as well as the mean and range of disadvantage (mean = 0; range: -3.811 to 3.901). The coefficients for the percentage of young residents (-.77) and the percentage of renters (.30) are significant, but not large enough to hold substantive significance.

The second model includes an interaction between each type of place of worship and a Black neighborhood indicator and tests the hypothesis that the association between places of worship and violent crime is more pronounced for predominantly Black neighborhoods. Interaction coefficients with no observations were removed from the output to conserve space. Only two interactions are statistically significant, and both provide different directions of support for the hypothesis. The interaction term between predominantly Black neighborhoods and the rate of Catholic churches per 1,000 people is negative, large, and statistically significant (-38.845). In adding this to the standalone coefficient for Catholic places of worship (-8.207), it can be concluded that predominantly Black neighborhoods with more Catholic churches experience significantly lower crime rates than predominantly non-Black neighborhoods with Catholic churches; for predominantly Black neighborhoods, as the number of Catholic churches per 1,000 people increases by 1, the number of violent crimes decreases by about 47.052 (-38.845 + -8.207), holding all other variables constant. The second significant coefficient represents the interaction between other places of worship and predominantly Black neighborhoods and is positive and large in magnitude (53.243). In adding this to the standalone coefficient for other places of worship (4.54), it can be concluded that predominantly Black

neighborhoods with a higher rate of other places of worship experience significantly higher crime rates than predominantly non-Black neighborhoods with other places of worship; for predominantly Black neighborhoods, as the number of other places of worship per 1,000 people increases by 1, the number of violent crimes increases by about 57.79 ( $53.243 + 4.54$ ), holding all other variables constant.

The third model tests the hypothesis that the association between places of worship and violent crime rates varies by the neighborhood's racial composition and levels of disadvantage. Only two of the three-way interactions are statistically significant, and both are positive, supporting different conclusions. In contrast to the standalone coefficient and two-way interaction between Black neighborhoods and Catholic churches, the three-way interaction between Black neighborhoods, Catholic churches, and disadvantage is positive and significant (51.063). In adding this to the standalone coefficient for Catholic churches (-12.38) in the third model, the Black neighborhood x Catholic church interaction coefficient (-147.77) in the third model, and the Catholic church x disadvantage coefficient (-6.639), it can be concluded that while Black neighborhoods with higher rates of Catholic churches do experience significant decreases in rates of violent crime, the strength of this association does slightly weaken for Black neighborhoods with higher levels of disadvantage but remains negative ( $(-12.38) + (-147.774) + (-6.639) + (51.063) = -115.73$ ). The magnitude of these coefficients is substantively significant but needs to be considered alongside the average rate of Catholic churches (.083). Additionally, the three-way interaction between Black neighborhoods, other places of worship, and disadvantage is positive and significant (47.14). In adding this to the standalone coefficient for Other places of worship (-12.86) in the third model, the Black neighborhood x Other interaction

**Table 7: SAR Models Predicting Violent Crime at the Block Group Level (RELTRAD)**

	(1) Violent Rate	(2) Violent Rate	(3) Violent Rate
Catholic Rate	-14.186*** (3.867)	-8.207* (3.399)	-12.38 (6.715)
Jewish Rate	6.211 (6.907)	6.149 (6.913)	-41.224** (12.69)
Evangelical Protestant Rate	.788 (2.704)	-1.092 (2.705)	-1.115 (2.918)
Black Protestant Rate	8.938*** (2.379)	12.687*** (2.791)	12.365*** (2.917)
Mainline Protestant Rate	8.731** (2.782)	7.088* (3.252)	12.242** (4.612)
Mormon Rate	-5.816 (7.708)	-18.804 (10.426)	-10.664 (6.765)
Non-Denominational Rate	-1.688 (4.046)	-.108 (5.32)	-16.772 (8.808)
Other Rate	6.301 (7.675)	4.541 (3.691)	-12.864* (6.433)
Disadvantage	15.406*** (2.111)	15.782*** (2.104)	15.436*** (2.265)
Immigration	-.073 (1.332)	-.27 (1.346)	-.027 (1.384)
Black Neighborhood	-3.039 (7.51)		
% Asian	-.017 (.196)	-.022 (.196)	-.01 (.189)
% Other	-.024 (.211)	-.042 (.221)	.018 (.216)
% Young	-.77*** (.183)	-.751*** (.183)	-.719*** (.184)
% Male	.347 (.276)	.354 (.279)	.308 (.273)
% Senior	-.529 (.278)	-.535 (.275)	-.477 (.273)
% 5+ Year Tenure	-.1 (.288)	-.078 (.3)	-.103 (.296)
% Tenure	.304*** (.079)	.304*** (.08)	.303*** (.081)
% Unemployed	-.122 (.316)	-.169 (.32)	-.244 (.308)
Black Neighborhood		-4.636 (7.736)	-15.501 (11.124)
Black Neighborhood x Catholic Rate		-38.845*** (10.626)	-147.774** (52.011)
Black Neighborhood x Evangelical Protestant Rate		4.537 (6.427)	4.646 (11.216)
Black Neighborhood x Black Protestant Rate		-2.675 (3.99)	6.885 (9.464)
Black Neighborhood x Mainline Protestant Rate		1.603 (6.03)	-16.639 (12.219)
Black Neighborhood x Mormon Rate		14.986 (14.208)	0 (0)
Black Neighborhood x Non-Denominational Rate		-4.349 (7.931)	36.83* (18.29)

Black Neighborhood x Other Rate	53.243** (16.843)	-18.516 (19.854)	
Catholic Rate x Disadvantage		-6.639 (3.52)	
Black Neighborhood x Disadvantage		6.378 (6.498)	
Black Neighborhood x Catholic Rate x Disadvantage		51.063* (21.347)	
Jewish Rate x Disadvantage		-15.672*** (4.114)	
Evangelical Protestant Rate x Disadvantage		-1.721 (1.406)	
Black Neighborhood x Evangelical Protestant Rate x Disadvantage		1.322 (5.805)	
Black Protestant Rate x Disadvantage		3.175 (3.977)	
Black Neighborhood x Black Protestant Rate x Disadvantage		-8.468 (6.022)	
Mainline Protestant Rate x Disadvantage		5.709* (2.253)	
Black Neighborhood x Mainline Protestant Rate x Disadvantage		1.097 (6.155)	
Mormon Rate x Disadvantage		7.713 (6.089)	
Non-Denominational Rate x Disadvantage		-8.899** (3.299)	
Black Neighborhood x Non-Denominational Rate x Disadvantage		-1.687 (7.366)	
Other Rate x Disadvantage		-9.142** (3.541)	
Black Neighborhood x Other Rate x Disadvantage		47.145*** (8.173)	
_cons	49.913 (35.105)	48.243 (36.141)	49.556 (35.494)
W: Violent Rate	.515*** (.048)	.505*** (.048)	.53*** (.047)
W: e. Violent Rate	-.423*** (.115)	-.399*** (.115)	-.447*** (.115)
Observations	564	564	564
Pseudo R <sup>2</sup>	.653	.661	.602

*Standard errors are in parentheses*

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

coefficient (-18.52) in the third model, and the Other x disadvantage interaction (-9.142), it can be concluded that Black neighborhoods with higher levels of disadvantage experience more violent crimes as the rate of other places of worship increase ( $-12.864 + (-18.516) + (-9.142) + (47.145) = 6.623$ ). All control variables did not substantially differ across models in terms of their direction, significance, and magnitude. The value of the spatial autocorrelation parameter for violent crime rate in each of these models was large (between .51 and .53) and statistically significant. The value of the spatial autocorrelation parameter for the autoregressive error terms of violent crime rate was moderate (between -.42 and -.39) and statistically significant. The Wald test of these spatial terms was also statistically significant across all three models.

#### Block Group-Level SAR Models Predicting Property Crime on RELTRAD Measure of Places of Worship

SAR models predicting property crime on the disaggregated RELTRAD measure of places of worship are in **Table 8**. The first model additively tests the association between places of worship and property crime rates. Like the violent crime regression models, Catholic churches are negatively associated with property crime rates (-12.75), holding all other variables constant. This finding is large enough to possess statistical significance when considering the mean rate and range of property crimes (mean =115.9; range = 9.23 to 696.4), but it should be noted that the rate of Catholic churches is low (0.083). The coefficient for Mainline Protestant churches is positive (11.28) but not statistically significant. Black Protestant churches are positively and significantly associated with property crime rates (6.406), holding all other variables constant. The Black Protestant coefficient holds minimal substantive significance when considering the descriptive statistics for property crimes, and it is important to recall that the rate of Black Protestant churches per 1,000 people is small (.302). Mormon churches, non-

denominational churches, and other places of worship are positively associated with property crime rates, but these findings are not statistically significant. Like the property crime models with the aggregated place of worship measure, the coefficients for disadvantage are not statistically significant. The coefficient for the percentage of young residents (-1.34) is negative and statistically significant, though is not large enough to possess substantive significance when considering the average percentage and range of young residents (mean = 37.7%, range = 0% - 91.2%). The coefficient for the percentage of renters is positive and statistically significant (.54) but is not substantively significant when considering the descriptive statistics for the percentage of renters (58.7%; minimum: 0%, maximum: 100%). The percentage of senior residents (-.978) is negatively and significantly associated with rates of violent crime but is not large enough to possess substantive significance when considering the mean and range of senior residents (mean = 11%; range = 0% to 56.7%). The coefficients for the immigration measure, the percentage of Asian residents, the percentage of residents from other racial groups, the percentage of male residents, the percentage of residents who have lived in their neighborhood for five years or longer, and the percentage of unemployed residents are not statistically significant.

The second model tests the hypothesis of a more pronounced association between places of worship and property crime for Black neighborhoods by including an interaction between each place of worship category and the predominantly Black neighborhood indicator. While the Catholic standalone coefficient and the Catholic-Black neighborhood interaction coefficient are predicted in the negative direction, neither are statistically significant. The only statistically significant interaction is between Mormon churches and predominantly Black neighborhoods, and the coefficient is positive and large in magnitude (119.36). In combining this coefficient to the standalone coefficient for Mormon churches (-73.63), it can be concluded that Black

neighborhoods with more Mormon churches experience higher rates of property crime than non-Black neighborhoods with more Mormon churches ( $119.36 - 73.63 = 45.73$ ). This finding is large enough to hold substantive significance when considering the mean and range of property crime rates, though it is important to note that the rate of Mormon churches per 1,000 people is significantly small (.002). The third model tests the hypothesis that the association between places of worship and property crime is more pronounced for highly disadvantaged Black neighborhoods. Only one of the three-way interactions was significant. The coefficient for the interaction between Other places of worship, Black neighborhoods, and disadvantage was positive and statistically significant (49.27). In adding this to the standalone coefficient for other places of worship (-35.53), the interaction between Black neighborhoods and other places of worship (-8.195), and the interaction between other places of worship and disadvantage (-21.538) it can be concluded that Black neighborhoods with higher levels of disadvantage actually experience significantly fewer property crimes as the number of other places of worship increases ( $49.27 + -35.53 + -8.195 + -21.538 = -15.993$ ). While the substantive significance of this finding is limited when considering the mean and range for property crime rates (mean = 115.9, range = 9.2 -696.4) and the mean rate of other places of worship (.03), this finding demonstrates that other places of worship within highly disadvantaged Black communities play a role in crime reduction. The value of the spatial autocorrelation parameter for property crime rate in each of these models is large (approximately .67) and statistically significant. The value of the spatial autocorrelation parameter for the spatial autoregressive error terms of property crime rate in each of the models is negative, moderate (between -.39 and .3), and statistically significant. The Wald test of spatial terms was statistically significant for all three models.

**Table 8: SAR Models Predicting Property Crime at the Block Group Level (RELTRAD)**

	(1) Property Rate	(2) Property Rate	(3) Property Rate
Catholic Rate	-12.752** (4.768)	-9.943 (7.381)	-1.574 (9.355)
Jewish Rate	12.299 (8.633)	11.861 (8.865)	-20.785 (43.724)
Evangelical Protestant Rate	3.531 (3.489)	.853 (4.527)	1.621 (4.666)
Black Protestant Rate	6.406* (2.714)	13.937 (7.644)	16.413* (7.299)
Mainline Protestant Rate	11.28 (6.705)	5.866 (9.365)	22.485 (13.952)
Mormon Rate	25.002 (25.87)	-73.629*** (15.732)	-23.017* (10.212)
Non-Denominational Rate	4.303 (10.503)	25.632 (27.27)	2.833 (28.023)
Other Rate	3.047 (6.323)	6.427 (7.39)	-35.53*** (10.228)
Disadvantage	4.426 (3.106)	4.658 (3.17)	3.046 (3.557)
Immigration	-.278 (1.738)	-.408 (1.744)	-.143 (1.882)
Black Neighborhood	-5.982 (9.346)		
% Asian	-.261 (.26)	-.295 (.26)	-.177 (.263)
% Other	.023 (.354)	-.005 (.363)	-.007 (.407)
% Young	-1.342*** (.291)	-1.354*** (.289)	-1.345*** (.283)
% Male	.293 (.415)	.314 (.418)	.188 (.411)
% Senior	-.978* (.398)	-1.022** (.394)	-1.024** (.389)
% 5+ Year Tenure	-.778 (.686)	-.755 (.704)	-.818 (.691)
% Renter	.54*** (.147)	.544*** (.143)	.536*** (.144)
% Unemployed	-.136 (.446)	-.19 (.45)	-.255 (.454)
Black Neighborhood		-7.037 (9.758)	-21.301 (13.477)
Black Neighborhood x Catholic Rate		-16.469 (11.547)	-130.274 (85.286)
Black Neighborhood x Evangelical Protestant Rate		4.404 (7.25)	11.093 (7.25)
Black Neighborhood x Black Protestant Rate		-7.037 (8.216)	-.104 (11.753)
Black Neighborhood x Mainline Protestant Rate		9.056 (13.594)	-29.713 (17.884)
Black Neighborhood x Mormon Rate		119.363*** (20.857)	0 (0)

Black Neighborhood x Non-Denominational Rate	-31.332 (28.635)	18.145 (38.921)	
Black Neighborhood x Other Rate	12.641 (13.342)	-8.195 (37.192)	
Catholic Rate x Disadvantage		1.992 (4.944)	
Black Neighborhood x Disadvantage		11.618 (7.982)	
Black Neighborhood x Catholic Rate x Disadvantage		39.1 (30.083)	
Jewish Rate x Disadvantage		-9.989 (11.899)	
Evangelical Protestant Rate x Disadvantage		-.875 (2.856)	
Black Neighborhood x Evangelical Protestant Rate x Disadvantage		-3.885 (5.318)	
Black Protestant Rate x Disadvantage		-.214 (7.771)	
Black Neighborhood x Black Protestant Rate x Disadvantage		-4.93 (9.125)	
Mainline Protestant Rate x Disadvantage		13.671* (6.712)	
Black Neighborhood x Mainline Protestant Rate x Disadvantage		-1.446 (9.859)	
Mormon Rate x Disadvantage		54.309*** (8.812)	
Non-Denominational Rate x Disadvantage		-15.006 (9.311)	
Black Neighborhood x Non-Denominational Rate x Disadvantage		3.004 (13.64)	
Other Rate x Disadvantage		-21.538** (6.785)	
Black Neighborhood x Other Rate x Disadvantage		49.273** (18.012)	
_cons	131.951 (78.844)	130.145 (80.165)	141.226 (78.079)
W: Property Rate	.672*** (.061)	.675*** (.064)	.666*** (.068)
W: e.Property Rate	-.355* (.148)	-.389* (.154)	-.334* (.152)
Observations	564	564	564
Pseudo R <sup>2</sup>	.339	.352	.234

*Standard errors are in parentheses*

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

## Tract Analyses

### Tract Descriptive Analyses

Descriptive statistics for the tract-level dataset are listed in **Table 9**. The total number of census tracts included in the dataset was 209. The mean number of places of worship per census tract is approximately 2.17, with a minimum of 0 and a maximum of 11. The average rate of places of worship per 1,000 people is 0.96, which is like the block group level. The average rate of Catholic churches in a census tract is approximately .103, and the average rate of Jewish congregations in a census tract is approximately 0.008. Black Protestant and Evangelical Protestant churches have the highest average rates in a census tract: 0.286 and .127, respectively. Mormon churches have the smallest average rate of .003. The average rate of non-denominational churches is approximately .07, and other places of worship have an average rate of .03. The mean percentage of Black residents within a census tract is 40.3%, though there are reported census tracts with 100% Black residence. White residents average about 1/3<sup>rd</sup> of a census tract's population (33.5%), and the maximum percentage of White residence in a census tract is 94.1%. The average percentage of Hispanic/Latinx residents in a tract is approximately 17.8%, with a maximum of 88.8%. Asian residents average about 5% of a tract's population, with a maximum residence of about 63%. Individuals of other racial groups make up an average of 6.9% of a tract's population, and up to 46%. There are census tracts where some racial groups do not make up any percentage of the population, which is expected, especially when considering Milwaukee's history of racial segregation (Johnson, 2022; Levine and Zipp, 1993). The mean percentage of young residents in a census tract is 37.8%, and senior residents average about 10.4% of a tract's population. The average percentage of renters within a census tract is 60.5%, and there are census tracts that are 100% renter occupied. Approximately 1/4<sup>th</sup> of

**Table 9: Descriptive Statistics of Tract-Level Variables**

Variables	Obs	Mean	Std. Dev.	Min	Max
Worship	209	2.167	2.051	0	11
Worship Rate	209	.958	1.251	0	8.056
Catholic	209	.239	.546	0	4
Catholic Rate	209	.103	.299	0	2.863
Jewish	209	.029	.238	0	3
Jewish Rate	209	.008	.065	0	.779
Black Protestant	209	.541	1.139	0	6
Black Protestant Rate	209	.286	.729	0	4.87
Mainline Protestant	209	.287	.653	0	5
Mainline Protestant Rate	209	.127	.378	0	3.579
Evangelical Protestant	209	.833	1.045	0	7
Evangelical Protestant Rate	209	.336	.489	0	3.46
Mormon	209	.01	.098	0	1
Mormon Rate	209	.003	.031	0	.419
Non-Denominational	209	.144	.414	0	2
Non-Denominational Rate	209	.066	.2	0	1.124
Other Place of Worship	209	.086	.329	0	2
Other Rate	209	.03	.124	0	1.007
% Black	209	40.333	34.919	0	100
% White	209	33.544	29.535	0	94.132
% Hispanic	209	17.809	23.357	0	88.765
% Asian	209	4.568	7.282	0	62.976
% Other Race	209	6.82	6.231	0	46.256
% Young	209	37.752	11.937	7.278	83.032
% Senior	209	10.368	5.755	.561	43.298
% Unemployed	209	6.965	4.669	0	28.214
% Renter	209	60.463	19.983	3.376	100
% Poverty	209	25.154	14.641	1.929	73.152
% Public Assistance or Food Stamps	209	29.209	17.674	.388	73.046
% No Bachelor's Degree	209	76.013	19.316	15.912	99.137
% Immigrant	209	9.602	10.058	0	45.487
% Limited English	209	4.622	6.872	0	30.544
% Female-Headed Family Households	209	39.618	21.164	0	87.368
% Male	209	48.348	5.384	36.853	70.389
Violent Crimes	209	190.947	129.144	7	553
Property	209	291.852	165.104	36	1212
Violent Crime Rate	209	76.192	57.617	3.224	279.543
Property Crime Rate	209	112.488	62.649	18.021	456.901

residents within a tract are below the poverty line (25%), with this number approaching 3/4ths for some census tracts (73.2%). The average percentage of individuals on food stamps in a census tract is 29.2%, and the mean percentage of individuals without a bachelor's degree is 76%. Immigrant residents average to about 9.6% of a tract's population, with limited-English speaking residents averaging about 4.6%. About 40% of a tract's family households are female-headed, and the average male population is 48%. The average number of violent crimes within a census tract is 190.9, with a violent crime rate per 1,000 people of about 76.2. The average number of property crimes per 1,000 people in a tract is approximately 291.9, with a property crime rate per 1,000 people of about 112.5.

**Table 10** shows the breakdown of the different types of worship within the tract-level dataset, totaling 453. The only difference between the block group and tract dataset is that 1 more Catholic church was retained for the tract dataset, because no tracts were missing data for the percentage of female-headed households. **Table 11** shows the breakdown of census tracts that are predominantly (70% or more) comprised of a singular racial group. Approximately 65, or 31.1% of census tracts are predominantly Black. 41, or 19.6% of census tracts are predominantly White, and 18, or 8.6% are predominantly Hispanic. No tracts are predominantly Asian or of another race, which means that 85, or 40.7% of tracts are racially mixed to an extent where no group is 70% or more of the residential population.

**Table 12** lists the summary statistics for the index measures of neighborhood disadvantage (% Black residence, % poverty, % public assistance, % limited education, % female-headed households, and % unemployed), and immigration (% immigrant residence, % limited English-speaking, and % Hispanic residence). The mean score for neighborhood disadvantage is 0, with a minimum of -3.924 and a maximum of 4.113. Approximately 111, or

**Table 10: Total Places of Worship, Aggregate and by Type**

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	Total
Total Places of Worship	453
Catholic	50
Jewish	6
Black Protestant	113
Mainline Protestant	60
Evangelical Protestant	174
Mormon	2
Non-Denominational	30
Other	18

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**Table 11: Tracts Predominantly (70% or more) Comprised of 1 Racial Group**

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	Total
Black Tract	65
White Tract	41
Hispanic Tract	18
Asian Tract	0
Other Race Tract	0

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**Table 12: Tract Summary Statistics for Neighborhood Disadvantage and Immigration Index Measures**

<b>Descriptive Statistics for Disadvantage Index Measure</b>					
Variable	Obs	Mean	Std. Dev.	Min	Max
Disadvantage	209	0	2.015	-3.924	4.113

<b>Tracts with Levels of Disadvantage Greater than the Mean</b>					
Variable	Obs	Mean	Std. Dev.	Min	Max
Disadvantage	111	1.654	1.003	.018	4.113

<b>Descriptive Statistics for Immigration Index Measure</b>					
Variable	Obs	Mean	Std. Dev.	Min	Max
Immigration	209	0	1.63	-1.377	5.358

<b>Tracts with Levels of Immigration Greater than the Mean</b>					
Variable	Obs	Mean	Std. Dev.	Min	Max
Immigration	53	2.393	1.57	.01	5.358

53%, of tracts have levels of disadvantage greater than the mean. In examining the distribution of disadvantage across Milwaukee, it can be confirmed that census tracts with higher levels of disadvantage are concentrated in the north and north-central parts of Milwaukee. A choropleth map of the distribution of disadvantage across census tracts is available in **Appendix A**. The mean score of immigration is 0, with a minimum of -1.377 and a maximum of 5.358.

Approximately 53, or 25% of tracts, have levels of immigration greater than the mean. A choropleth map of the distribution of immigration across Milwaukee demonstrates that the highest levels of immigration are almost exclusively clustered on the southside of Milwaukee. This map is also located in **Appendix A**.

Tract-Level SAR Models Predicting Violent Crime on Aggregated Places of Worship  
 SAR models predicting violent crime on an aggregated measure of places of worship are in **Table 13**. The first model does not support the first hypothesis of a negative association between places of worship and violent crime; on the contrary, the coefficient for the rate of places of

worship is positive and significant (7.02). As the number of places of worship per 1,000 people increases by 1, the number of violent crimes per 1,000 people increases by about 7, holding all other variables constant. The substantive significance of this finding is debatable when considering the mean and range of violent crime rates (mean = 76.2, range = 3.2 – 279.5), as well as the fact that the rate of places of worship is approximately .95. The percentage of young residents is negatively and significantly associated with violent crime rates (-.679), but the magnitude of this finding is not substantively significant when considering the mean and range of the percentage of young residents (mean = 37.8%, range = 7.3% – 83%). As the percentage of senior residents increases by 1%, the number of violent crimes per 1,000 people decreases by 1 (-1.056), holding all other variables constant. Considering the average percentage of senior residents (10.4%), this finding is large enough to possess substantive significance. The coefficient for the percentage of renters is positive and significant (.264) but is not large enough to have substantive significance when considering the mean and range of the percentage of renters (mean = 60.5%, range = 3.38% -100%). The coefficients for immigration, Black neighborhoods, the percentage of Asian residents, the percentage of residents of other racial groups, the percentage of male residents, and the percentage of residents who have lived in their neighborhood for five years or more are not statistically significant. Model 2 tests the expectation that the effects of places of worship on violent crime will be more pronounced for Black neighborhoods. The coefficients in model 2 do not differ in significance. The coefficient for the rate of places of worship is slightly smaller in magnitude (4.159) but is still statistically significant. The interaction between places of worship and Black neighborhoods is positive (6.218), but not statistically significant. Therefore, these findings do not support the third hypothesis. Finally, the last model tests the hypothesis that the relationship between places of

**Table 13: SAR Models Predicting Violent Crime at the Tract Level**

	(1)	(2)	(3)
	Violent Rate	Violent Rate	Violent Rate
Worship Rate	7.016*** (1.899)	4.159** (1.399)	4.16* (1.738)
Disadvantage	12.202*** (2.041)	12.267*** (2.016)	12.053*** (2.353)
Immigration	1.081 (1.322)	.898 (1.356)	1.016 (1.371)
Black Neighborhood	9.132 (8.036)		
% Asian	.336 (.234)	.357 (.235)	.348 (.241)
% Other	.301 (.28)	.268 (.266)	.277 (.271)
% Young	-.679*** (.204)	-.673*** (.204)	-.68** (.21)
% Male	.289 (.336)	.365 (.326)	.249 (.323)
% Senior	-1.056** (.394)	-1.035** (.372)	-1.019** (.359)
% 5+ Year Tenure	-.151 (.414)	-.051 (.413)	-.05 (.398)
% Renter	.264** (.095)	.313*** (.09)	.327*** (.089)
Black Neighborhood		2.894 (8.787)	15.026 (10.958)
Black Neighborhood x Worship Rate		6.218 (3.406)	-.477 (6.732)
Worship Rate x Disadvantage			-.029 (.797)
Black Neighborhood x Disadvantage			-7.351 (5.975)
Black Neighborhood x Worship Rate x Disadvantage			3.608 (3.082)
_cons	52.625 (45.972)	39.544 (45.31)	43.464 (44.518)
W: Violent Rate	.433*** (.058)	.408*** (.058)	.422*** (.058)
Observations	209	209	209
Pseudo R <sup>2</sup>	.805	.812	.818

*Standard errors are in parentheses*

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

worship and violent crime is more pronounced for predominantly Black disadvantaged neighborhoods. Support is not present for this hypothesis. The coefficient for the places of worship x Black neighborhood x disadvantage interaction is positive and not statistically significant (3.608). The value of the spatial autocorrelation parameter for violent crime rate in each of these models was large (between .40 and .43) and statistically significant. The Wald test of spatial terms was also statistically significant for all three models. A spatial lag for autoregressive error terms was not employed in these models because the statistical test for this specification was not statistically significant. Overall, this set of models do not support the study's main hypotheses.

#### Tract-Level SAR Models Predicting Property Crime on Aggregated Places of Worship

SAR models predicting property crime on an aggregated measure of places of worship are in **Table 14**. Like the violent crime models, this set of models does not provide support for the study's main hypotheses. The first model tests the hypothesis that places of worship are negatively associated with property crime. Conversely, the coefficient for the rate of places of worship per 1,000 people is positive and significant (7.509); as the number of places of worship per 1,000 people increases by 1, the number of property crimes per 1,000 people increases by 7.5, holding all other variables constant. The substantive significance of this finding is debatable when considering the descriptive statistics for places of worship the rate of places of worship (mean = .95) and rate of property crime (mean = 76.2, range = 3.2 – 279.5). The percentage of young residents is negatively associated with property crime (-1.582), though this finding lacks substantive significance when considering the mean percentage of young residents within a census tract (37.8%). The percentage of senior residents is negatively and significantly associated with property crime (-1.89), and this finding is large enough to possess substantive

**Table 14: SAR Models Predicting Property Crime at the Tract Level**

	(1) Property Rate	(2) Property Rate	(3) Property Rate
Worship Rate	7.509* (2.93)	5.375 (4.653)	3.221 (3.77)
Disadvantage	.062 (3.02)	-.142 (3.012)	2.23 (3.54)
Immigration	2.174 (2.855)	2.071 (2.904)	2.051 (3.031)
Black Neighborhood	17.256 (12.097)		
% Asian	.375 (.271)	.382 (.273)	.34 (.298)
% Other	.161 (.505)	.139 (.508)	.231 (.563)
% Young	-1.582*** (.414)	-1.581*** (.414)	-1.634*** (.421)
% Male	.499 (.672)	.563 (.666)	.622 (.666)
% Senior	-1.89** (.586)	-1.876** (.586)	-1.857** (.594)
% 5+ Year Tenure	-.476 (.679)	-.41 (.666)	-.333 (.689)
% Renter	.833*** (.225)	.881*** (.227)	.85*** (.222)
Black Neighborhood		12.711 (12.799)	5.85 (12.73)
Black Neighborhood x Worship Rate		4.517 (5.549)	8.096 (7.554)
Worship Rate x Disadvantage			-2.813 (1.979)
Black Neighborhood x Disadvantage			.934 (6.959)
Black Neighborhood x Worship Rate x Disadvantage			1.853 (3.386)
_cons	93.798 (85.046)	84.083 (82.849)	78.462 (85.062)
W: Property Rate	.501*** (.079)	.488*** (.083)	.493*** (.082)
Observations	209	209	209
Pseudo R <sup>2</sup>	.539	.54	.545

*Standard errors are in parentheses*

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

significance when considering the average percentage of senior residents is 10.4%. The percentage of renters is positively and significantly associated with property crime (.833), but this finding is not substantively significant when considering the average percentage and range of renters (mean = 60.5, range = 3.38-100). The second model tests the hypothesis that the association between places of worship and property crime is more pronounced for predominantly Black neighborhoods. The standalone coefficient for places of worship is positive (5.375) but no longer significant. The interaction term for places of worship x Black neighborhoods is also positive (4.517), but not statistically significant. All other control variables maintained their significance and magnitude. The third model tests the hypothesis that the association between places of worship and property crime will be more pronounced for highly disadvantaged Black neighborhoods. Again, the standalone coefficient for places of worship (3.22) is positive but not statistically significant. The places of worship x Black neighborhood x disadvantage interaction coefficient (1.853) is positive but not statistically significant. Overall, the findings from this set of models demonstrates that places of worship, when measured in an aggregate fashion, are positively (rather than negatively) associated with property crime, and this association does not significantly vary for Black neighborhoods and highly disadvantaged Black neighborhoods. The spatial autocorrelation parameter for the property crime spatial lag term is moderate and significant (between .48 and .50) across all models, and the Wald test of spatial terms was statistically significant for all models. A spatial lag for autoregressive error terms was not employed in these models because the statistical test for this specification was not statistically significant.

## Tract-Level SAR Models Predicting Violent Crime on RELTRAD Measure of Places of Worship

**Table 15** presents the tract-level SAR models predicting violent crime on the RELTRAD measure of places of worship and all other control variables. The models provide mixed support for the study's hypotheses. In the first model, the coefficient for Catholic churches is negative (-772511.03), but not statistically significant. The coefficient for Jewish places of worship is large, positive, and significant (47.72), and large enough to possess substantive significance when considering the average rate of violent crimes (76.19). However, it should be contextualized in the fact that the average rate of Jewish places of worship per 1,000 people (.008). The coefficient for Evangelical Protestant churches is positive but insignificant (2.37). Black Protestant churches (11.503) and Mainline Protestant churches (13.948) are positively and significantly associated with violent crime, and these findings are large enough to hold substantive significance. It is, however, important to recall that the average rate of Black Protestant churches per 1,000 people is .286, and the average rate of Mainline Protestant churches per 1,000 is .336. Mormon churches are negatively and significantly associated with violent crime (-48.019), and while this finding is substantively significant, the rate of Mormon churches per 1,000 people is very low (.003). The coefficients for non-denominational churches (15.24) and other churches (.128) are positive but not significant. Disadvantage is positively and significantly associated with violent crime (11.488). Immigration is positively associated with violent crime (2.185) but is not statistically significant. The percentage of young residents is negatively and significantly associated with violent crime (-.799), though this finding is not large enough to display substantive significance when considering the average percentage of young residents within a tract (mean = 37.76%, range = 7.28% - 83.03%). The percentage of senior residents is negatively and significantly associated with violent crime (-1.026), and this finding is substantively significant when

considering the average percentage of senior residents (10.4%). The percentage of renters is positively associated with violent crime (.342) but is not substantively significant when the descriptive statistics of the percentage of renters are considered (mean= 60.4%, range = 3.38%-100%). Model 2 tests the hypothesis that the association between places of worship and violent crime will be more pronounced for Black neighborhoods. Only one of the places of worship x Black neighborhood interactions is statistically significant. The coefficient for the interaction between Catholic churches and Black neighborhoods is large, negative, and statistically significant (-37.493). In adding this to the standalone coefficient for Catholic churches (-6.639), it can be concluded that as the number of Catholic churches per 1,000 people increases by 1, Black neighborhoods experience a decrease in violent crimes per 1,000 of about 44.1 (-37.493 + -6.639). **Figure 3**, located in **Appendix B**, visually models how the effects of Catholic churches on violent crime varies by the racial composition of the neighborhood; while Black neighborhoods with 0 Catholic churches have a slightly higher rate of violent crimes than non-Black neighborhoods, Black neighborhoods experience more pronounced decreases in violent crime rates than non-Black neighborhoods as the number of Catholic churches per 1,000 people increases.

Model 3 tests the hypothesis that the association between places of worship and violent crime will be more pronounced for Black neighborhoods that are highly disadvantaged. Only two three-way interactions are statistically significant, and each supply mixed support for this third hypothesis. The three-way interaction coefficient between Mainline Protestant churches, Black tracts, and disadvantage is negative, large, and statistically significant (-29.97). This coefficient can be better understood when examining the additional Mainline Protestant x Black tract

**Table 15: SAR Models Predicting Violent Crime at the Tract Level (RELTRAD)**

	(1) Violent Rate	(2) Violent Rate	(3) Violent Rate
Black Neighborhood	7.616 (7.77)		
Catholic Rate	-11.03 (7.213)	-6.639 (9.974)	-9.872 (8.979)
Jewish Rate	47.719** (18.398)	46.086* (20.725)	-128.203*** (23.821)
Evangelical Protestant Rate	2.367 (5.568)	3.8 (6.142)	1.287 (7.799)
Black Protestant Rate	11.503* (4.802)	9.255 (6.521)	29.464** (10.616)
Mainline Protestant Rate	13.948** (5.262)	13.456 (8.189)	32.922** (12.085)
Mormon Rate	-48.019*** (11.897)	-77.902** (28.459)	-84.466*** (23.978)
Non-Denominational Rate	15.244 (11.43)	3.488 (11.494)	7.582 (10.199)
Other Rate	.128 (9.72)	-.204 (11.035)	-12.297 (15.068)
Disadvantage	11.488*** (1.98)	11.745*** (2.033)	10.858*** (2.33)
Immigration	2.185 (1.279)	2.109 (1.291)	2.522 (1.324)
% Asian	.319 (.217)	.335 (.222)	.334 (.208)
% Other	.464 (.283)	.481 (.289)	.314 (.295)
% Young	-.799*** (.167)	-.802*** (.188)	-.812*** (.186)
% Male	.137 (.348)	.058 (.36)	-.131 (.302)
% Senior	-1.026** (.358)	-.978** (.376)	-1.001** (.337)
% 5+ Year Tenure	-.061 (.386)	-.055 (.393)	-.256 (.392)
% Renter	.342*** (.089)	.34*** (.09)	.387*** (.088)
Black Neighborhood		6.988 (9.536)	18.494 (12.018)
Black Neighborhood x Catholic Rate		-37.493* (19.002)	-75.52 (45.377)
Black Neighborhood x Jewish Rate		77.207 (42.382)	252.49*** (52.999)
Black Neighborhood x Evangelical Protestant Rate		-1.618 (10.136)	-22.004* (9.166)
Black Neighborhood x Black Protestant Rate		1.393 (9.023)	-14.205 (16.369)
Black Neighborhood x Mainline Protestant Rate		1.415 (11.088)	-6.946 (14.533)
Black Neighborhood x Mormon Rate		32.059 (32.879)	0 (0)
Black Neighborhood x Non-Denominational Rate		16.38 (20.939)	-20.207 (59.613)

Black Neighborhood x Other Rate	18.697 (44.707)	1132.065 (811.449)	
Catholic Rate x Disadvantage		-7.235 (4.64)	
Black Neighborhood x Disadvantage		-4.253 (7.876)	
Black Neighborhood x Catholic Rate x Disadvantage		20.193 (16.635)	
Jewish Rate x Disadvantage		-52.862*** (6.99)	
Evangelical Protestant rate x Disadvantage		-.675 (4.346)	
Black Neighborhood x Evangelical Protestant Rate x Disadvantage		14.161* (6.212)	
Black Protestant Rate x Disadvantage		-5.156 (9.795)	
Black Neighborhood x Black Protestant Rate x Disadvantage		3.907 (11.172)	
Mainline Protestant Rate x Disadvantage		17.447*** (5.252)	
Black neighborhood x Mainline Protestant Rate x Disadvantage		-29.967** (10.234)	
Mormon Rate x Disadvantage		28.844 (17.638)	
Non-Denominational Rate x Disadvantage		-4.573 (3.351)	
Black neighborhood x Non-Denominational Rate x Disadvantage		17.24 (20.502)	
Other Rate x Disadvantage		-10.183 (9.057)	
Black Neighborhood x Other Rate x Disadvantage		-767.755 (590.658)	
_cons	50.475 (44.964)	53.184 (43.915)	80.533 (41.815)
W: Violent Rate	.441*** (.059)	.446*** (.059)	.411*** (.057)
Observations	209	209	209
Pseudo R <sup>2</sup>	.828	.833	.766

*Standard errors are in parentheses*

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

interaction in the third model (-6.95), the Mainline Protestant x disadvantage interaction (17.447) and the standalone Mainline Protestant coefficient (32.92). Accordingly, Black neighborhoods with higher levels of disadvantage experience significantly fewer violent crimes per 1,000 people than Black neighborhoods with lower levels of disadvantage, though the association is still positive ( $32.922 + (-6.946) + (17.447) + (-29.967) = 13.456$ ). This finding should be considered alongside the average rate of Mainline Protestant churches (.127) and the average violent crime rate (76.19), but is notable due to the sustainment of the significant positive association. The other significant three-way interaction is between Evangelical Protestant churches, Black neighborhoods, and disadvantage, and its coefficient is positive (14.161). This coefficient can be added to the two-way interaction coefficient between Black neighborhoods and Evangelical Protestant churches (-22.004), the standalone coefficient for Evangelical Protestant churches (1.287), and the two-way interaction coefficient between Evangelical churches and disadvantage (-.675). Accordingly, Black neighborhoods with higher levels of disadvantage experience a significant decrease in violent crimes as the number of Evangelical churches ( $(1.287) + (-22.004) + (-.675) + (14.161) = -5.881$ ). These findings should be considered alongside the average rate of Evangelical churches (.336) and the average rate of violent crime (76.19). Overall, the findings from this set of models show that the effects of places of worship on violent crime rates do vary by the racial composition and levels of disadvantage in the neighborhood, but these associations are also conditioned by the religious tradition and denomination. The spatial autocorrelation parameter for the violent crime spatial lag term is moderate and significant (between .41 and .45) across all models, and the Wald test of spatial terms was statistically significant for all models. A spatial lag for autoregressive error terms was not employed in these models because the statistical test for this specification was not statistically significant.

## Tract-Level SAR Models Predicting Property Crime on RELTRAD Measure of Places of Worship

The tract-level SAR models predicting property crime on the RELTRAD measure of places of worship and all other control variables are listed in **Table 16**. The first model tests the hypothesis that places of worship are negatively associated with property crime. Mixed support for this hypothesis is present. The coefficient for the rate of Catholic churches is negative (-1.916), but not significant. The coefficient for the rate of Jewish places of worship is positive, large, and statistically significant (62.69). As the number of Jewish places of worship per 1,000 people increases by 1, the number of property crimes per 1,000 people increases by about 62.7, holding all other variables constant. The substantive significance of this finding is limited when recalling that the average rate of Jewish places of worship for census tracts is 0.008. The coefficients for Black Protestant churches (2.479) and Mainline Protestant churches (17.002) are positive, but not statistically significant. Mormon churches are negatively and significantly associated with property crime (-51.581). As the number of Mormon churches per 1,000 people increases by 1, the number of property crimes per 1,000 people decreases by about 51.6, holding all other variables constant. The substantive significance of this finding is limited and should be considered alongside the low rate of Mormon churches in census tracts (.003). Non-denominational churches are positively and significantly associated with property crime (27.907). It is important to substantively contextualize this finding in the fact that the rate of non-denominational churches is .066. Other places of worship are negatively associated with property crime (-1.329), but this finding is not statistically significant. Like the previous sets of property crime models, disadvantage is not significantly associated with property crime rates. The coefficient for the percentage of young residents (-1.804) is negative and significant, though is

not large enough to possess substantive significance when considering the mean and range of the percentage young residents (mean = 37.8%, range = 7.28% - 83.03%). The coefficient for the percentage of senior residents is negative and statistically significant (-1.966) and is large enough to demonstrate substantive significance when considering the average of senior residents in a census tract (10.37%). The coefficients for immigration, the percentage of Asian residents, the percentage of residents of other races, the percentage of male residents, and the percentage of residents who have lived in their residence for at least five years are not statistically significant.

The second model tests the hypothesis that the association between places of worship and property crime will be more pronounced for Black neighborhoods. This hypothesis is not supported; none of the interactions between places of worship across religious traditions and denominations and Black neighborhoods are statistically significant. The third model tests the hypothesis that the association between places of worship and property crime will be more pronounced for highly disadvantaged Black neighborhoods. Support for this hypothesis is again, mixed. The interaction coefficient between Catholic churches, Black neighborhoods, and disadvantage is large, positive, and statistically significant (70.265). Interpreting this interaction requires referencing the additional two-way interaction between Catholic churches and Black neighborhoods (-227.722), the two-way interaction between Catholic churches and disadvantage (-10.624), and the standalone coefficient for Catholic churches (8.804).

**Table 16: SAR Models Predicting Property Crime at the Tract Level**

	(1)	(2)	(3)
	Property Rate	Property Rate	Property Rate
Black Neighborhood	15.717 (11.988)		
Catholic Rate	-1.916 (23.796)	17.414 (35.549)	8.804 (27.685)
Jewish Rate	62.269* (29.169)	73.088* (32.101)	-1.815 (150.981)
Evangelical Protestant Rate	11.05 (5.75)	9.34 (14.47)	11.36 (12.6)
Black Protestant Rate	2.479 (3.672)	-9.863 (23.302)	43.618 (25.868)
Mainline Protestant Rate	17.002 (14.532)	-11.328 (19.9)	-11.477 (20.491)
Mormon Rate	-51.581** (19.302)	-54.37 (69.845)	-109.311* (50.819)
Non-Denominational Rate	27.907* (11.387)	66.31* (28.746)	53.55 (28.76)
Other Rate	-1.329 (32.031)	.496 (34.326)	-59.288 (48.381)
Disadvantage	1.226 (2.892)	1.733 (2.514)	-.707 (4.113)
Immigration	2.633 (2.569)	1.636 (2.332)	2.648 (2.587)
% Asian	.377 (.279)	.251 (.367)	.044 (.402)
% Other	.166 (.464)	.042 (.507)	.138 (.483)
% Young	-1.804*** (.425)	-1.834*** (.425)	-1.823*** (.385)
% Male	.517 (.648)	.3 (.685)	.048 (.66)
% Senior	-1.966** (.603)	-1.939** (.601)	-2.018*** (.611)
% 5+ Year Tenure	-.464 (.635)	-.324 (.618)	-.352 (.614)
% Renter	.867*** (.221)	.955*** (.232)	1.016*** (.216)
Black Neighborhood		8.96 (12.187)	23.532 (17.391)
Black Neighborhood x Catholic Rate		-66.982 (48.554)	-227.722** (71.374)
Black Neighborhood x Jewish Rate		-14.891 (63.282)	47.752 (183.023)
Black Neighborhood x Evangelical Protestant Rate		2.106 (17.205)	-20.959 (16.731)
Black Neighborhood x Black Protestant Rate		12.705 (23.129)	-68.916* (28.011)
Black Neighborhood x Mainline Protestant Rate		45.806 (27.414)	67.301* (29.815)
Black Neighborhood x Mormon Rate		4.166 (72.894)	0 (0)
Black Neighborhood x Non-Denominational Rate		-48.724 (30.75)	-93.064 (74.808)

Black Neighborhood x Other Rate	-31.923 (41.912)	-567.929 (862.883)	
Catholic Rate x Disadvantage		-10.624 (12.396)	
Black Neighborhood x Disadvantage		-5.237 (10.417)	
Black Neighborhood x Catholic Rate x Disadvantage		70.265** (26.047)	
Jewish Rate x Disadvantage		-22.232 (40.393)	
Evangelical Protestant x Disadvantage		6.619 (7.42)	
Black Neighborhood x Evangelical Protestant Rate x Disadvantage		7.185 (9.283)	
Black Protestant Rate x Disadvantage		-15.879 (15.381)	
Black Neighborhood x Black Protestant Rate x Disadvantage		27.011 (15.976)	
Mainline Protestant Rate x Disadvantage		13.309 (9.319)	
Black Neighborhood x Mainline Protestant Rate x Disadvantage		-30.029 (15.795)	
Mormon Rate x Disadvantage		49.42 (39.084)	
Non-Denominational Rate x Disadvantage		-12.079 (10.847)	
Black Neighborhood x Non-Denominational Rate x Disadvantage		31.48 (27.223)	
Other Rate x Disadvantage		-46.563 (29.185)	
Black Neighborhood x Other Rate x Disadvantage		483.77 (627.305)	
_cons	99.217 (79.906)	94.099 (77.805)	102.787 (73.616)
W: Property Rate	.489*** (.095)	.508*** (.103)	.526*** (.101)
Observations	209	209	209
Pseudo R <sup>2</sup>	.559	.577	.553

*Standard errors are in parentheses*

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

Accordingly, Black neighborhoods with higher levels of disadvantage experience significantly fewer property crimes as the number of Catholic churches per 1,000 people increases by 1 ( $-218.92 + 70.625 = -159.277$ ). The substantive significance of this finding should be considered alongside the average rate of Catholic churches (.103). The coefficient for the interaction between Mainline Protestant churches, Black neighborhoods, and disadvantage is negative and marginally significant ( $-30.02927$ ;  $p = 0.057$ ). In drawing attention to the additional two-way coefficient between Mainline churches and Black neighborhoods (67.30051), the two-way interaction for Mainline churches and disadvantage (13.309) and the standalone coefficient for Mainline protestant churches (-11.47654), it can be concluded that Black neighborhoods with higher levels of disadvantage experience significantly higher rates of property crimes ( $67.300 + -11.477 + 13.309 - 30.029 = 39.103$ ). The significance and magnitude of the control variables remain the same across all three models. Overall, only support for the first and fourth hypotheses was found in this set of models, and these findings are again conditional on religious tradition and denomination. The spatial autocorrelation parameter for the property crime spatial lag term is moderate and significant (between .48 and .53) across all models, and the Wald test of spatial terms was statistically significant for all models. A spatial lag for autoregressive error terms was not employed in these models because the statistical test for this specification was not statistically significant.

## Discussion

The results of these regression models contribute to the mixed findings surrounding religion and crime, but present substantial evidence that the effects of places of worship on rates of violent and property crime vary across geographical scope (block group versus tract-level), and neighborhood characteristics, including race and socioeconomic disadvantage. Results also

demonstrate that it is particularly important to consider religious traditions and denominations when assessing the effects of places of worship on crime. The first hypothesis expects places of worship to have an inverse association with rates of property and violent crime, and the second hypothesis expects Catholic churches to especially demonstrate an inverse association with violent and property crime. When utilizing the aggregated measure of places of worship, the first hypothesis is unsupported; at both the block group and tract level, places of worship are positively and significantly associated with violent and property crime. However, when the disaggregated RELTRAD measure is employed, it becomes clear that the strength and direction of this association differs across religious traditions and denominations. At the block group level, Catholic churches are negatively and significantly associated with both violent and property crime, Black Protestant churches are positively and significantly associated with violent and property crime, and Mainline Protestant churches are positively associated with violent crime. At the tract-level, Jewish places of worship are positively and significantly associated with violent and property crime, and Black Protestant and Mainline Protestant churches are positively and significantly associated with violent crime. Conversely, Mormon churches are negatively and significantly associated with violent and property crime.

The third hypothesis expects the association between places of worship and crime to be more pronounced for Black neighborhoods. Again, mixed support for this hypothesis ensues across the measure of the focal independent variable of places of worship, geographic scope, and religious tradition. At the block group level, Black neighborhoods experience a more pronounced negative association between Catholic churches and violent crime, and a more pronounced positive association between Other places of worship and violent crime. Black neighborhoods also experience a significant positive association between Mormon churches and property crime,

in contrast to a significant negative association between Mormon churches and property crime for non-Black neighborhoods. At the tract level, support for this hypothesis is sustained for Catholic churches; Black neighborhoods experience a more pronounced association between Catholic churches and violent crime.

The final hypothesis expects for the association between places of worship and crime to be more pronounced for highly disadvantaged Black neighborhoods. Interestingly, insight for this hypothesis is provided when utilizing the aggregate measure of places of worship. At the block group level, Black neighborhoods with higher levels of disadvantage experience significantly weaker positive associations between places of worship and violent and property crimes. Highly disadvantaged Black neighborhoods with higher rates of Catholic churches experience significant fewer violent crimes. Conversely, Black neighborhoods with higher rates of disadvantage experience slightly more violent crimes as Other places of worship increase. At the tract level, Black neighborhoods with higher levels of disadvantage experience significantly lower rates of violent crime as the rate of Evangelical Protestant churches increases. and violent crime significantly weakens for Black neighborhoods with higher levels of disadvantage but remains negative. Black neighborhoods with higher levels of disadvantage also experience significantly higher rates of property crime.

As previously stated, multiple variables can account for the variation in findings within this study, and previous research has offered different explanations. An interesting finding within this study is that Black Protestant and Mainline Protestant churches were positively associated with crime at both the block group and tract level, compared to Catholic churches, which were consistently negatively associated with crime. Previous literature has discussed how some religious traditions may be more positively linked to crime than others; for example, research has

distinguished between bridging and bonding churches, where bridging churches seek to connect their congregations and missions to the broader community, and bonding churches are more focused on keeping the congregation a tight-knit in group and less interested in engaging with the broader community (Beyerlein and Hipp, 2005; Desmond et al., 2010; Warner and Konkel, 2019). Evangelical churches have been found to be more strongly associated with crime, and civic-engagement oriented organizations to be inversely related to some types of crime (Desmond et al., 2010). Additionally, different religious traditions may have/promote a higher tolerance for specific crimes, which may alter or complicate the moral compass communities utilize/experience (Desmond et al., 2010; see also Ellison et al., 2003). While the current study does not explicitly categorize different churches as bridging or bonding, it does demonstrate that the *type* of place of worship plays a significant role in the place of worship-crime association.

The significant negative associations between Catholic churches and violent and property crime, as well as the pronouncement of this association for Black neighborhoods, is a particularly important contribution of this study. While prior research such as Beyerlein and Hipp (2005) has found that both Mainline and Catholic churches are negatively associated with crime rates at the county level, the current study's findings show that Catholic churches are more consistently related to a decrease in crime rates than Mainline churches within the city of Milwaukee. Greenberg (2000) discusses how both the Catholic church and the Black church "maintain a strong commitment to service provision combined with social action" (p, 392), compared to Mainline churches, who "have struggled to maintain a commitment to social welfare" (p. 391) and have undergone a decline in political action and community outreach since the 1970s. Conversely, Catholic churches have historically performed important roles within the lives of immigrants and individuals within urban areas, especially during times of White flight and

suburbanization (Borg, 2020; Greenberg, 2000; Lopez, 2016). The Archdiocese of Milwaukee is an especially expansive network of parishes and schools serving the city of Milwaukee, Milwaukee County, and bordering Milwaukee counties throughout Southeastern Wisconsin, and the organization has actively responded to the needs of Milwaukee's residents since the mid nineteenth century.<sup>xiii</sup> During the period of racial transition in Milwaukee and surrounding cities in the mid-1900s, Catholic parishes and schools responded to the flight of White residents and the influx of African American residents and underwent significant transitions (Avella, n.da.). Ministers who were a part of the Capuchin Friars sought to welcome African American parishioners and address "the spiritual and social needs of their neighborhoods" (Avella, n.db.). As the Latinx population in Milwaukee began to significantly grow during the 1960s, the archdiocese worked to reach this population and expand its ministry to Spanish-speaking individuals. Additionally, the archdiocese supports multiple social justice ministry initiatives, with ones rooted in anti-poverty (Catholic Campaign for Human Development), immigrant justice (Justice for Immigrants), incarceration support (Prison Ministry), and community-based interaction and support (Public Policy and Legislative Action).<sup>xiv</sup> In conjunction with this study's findings, it is clear that Catholic churches perform an important role within Milwaukee's communities as a social institution at the neighborhood level.

In addition to religious traditions having the potential to inform the direction of the association between places of worship and crime, it is also helpful to examine two studies within the religion-crime literature that have found positive associations between the presence of places of worship and crime rates. Desmond and colleagues (2010) argue that this positive relationship may be because churches tend to be placed in nonresidential, commercial areas, rather than being embedded within residential neighborhoods. Commercial areas can attract individuals and a

variety of interactions that would occur regardless of whether a church was present, and more lots, parking structures, and other public spaces may be more attractive to individuals seeking to commit a crime (Desmond et al., 2010). This reasoning highlights the importance of not only addressing the physical counts of places of worship in a neighborhood, but also their *spatial location*; accordingly, if places of worship are mostly storefront congregations and are located within nonresidential areas, they may not be able to enact sufficient informal social control and contribute to crime reduction within a residential neighborhood.

This point made by Desmond and colleagues (2010) introduces a limitation to the current study; while this project addresses the physical presence and counts of places of worship in a block group and census tract, it does not account for their spatial distribution and corresponding implications, such as where exactly these places of worship are within a census block group or tract. Future research will follow procedures such as those of Warner and Konkel (2019) to define and analyze buffer zones around places of worship, examining if there is a relationship between where a place of worship is situated within a block group or tract and to what extent this affects crime rates within and around the spatial units. Future research will also examine if the effects of places of worship on crime rates within block groups or tracts differ depending on if a spatial unit is adjacent to units with more or fewer places of worship.

Furthermore, it is important to reiterate that many religious institutions are tasked with addressing the needs of the communities they inhabit, especially when funded by the government to provide social welfare services. In discussing the pragmatic reasons that may inform their finding that more churches are associated with more street crimes and domestic assaults, Triplett and colleagues (2013) discuss how the social services many churches provide have the tendency to attract individuals from all walks of life, including those who are dealing with adverse

experiences and may be experiencing strain. Triplett and colleagues (2013) cite strain theory as a reason why these individuals may have a higher likelihood of engaging in crime (Triplett et al 2013). In addition to this, Desmond and colleagues state that “certain social conditions contribute to the founding of congregations, not the other way around” (Desmond et al., 2010, p. 50). Many congregations were founded to address social needs and social problems within a community, so they may be present where social problems are most severe.

## Conclusion

The purpose of this study was to employ a neighborhood-level analysis to examine the extent to which places of worship were associated with lower crime rates, as well as how this association differed by the racial and socioeconomic composition of the neighborhoods under analysis. This study provides geographical and regional variation to the current literature, which tends to focus on Southern, rural, and county spaces, and employed different levels of geographical scopes (block groups and census tracts) to more precisely capture neighborhood effects and examine if and how results changed depending on the level of aggregation. This work significantly differs from prior research. Firstly, this study compared the effects of places of worship in two ways: by considering all places of worship together, and by disaggregating across religious traditions and denominations. Secondly, this study considered and tested how race and neighborhood disadvantage moderated the association between places of worship and violent and property crime. This study provides significant insight into the religion-crime literature. Firstly, the study’s findings demonstrate the continued influence that Catholic churches have on neighborhood outcomes past the nineteenth and twentieth centuries. Moreover, only two articles at the time of this study have found significant positive associations between places of worship and crime (Desmond et al, 2010; Triplett et al, 2013). While this work contributes to the

conflicting findings surrounding religion and crime, it also signals the importance of examining how the effects of places of worship may differ/change depending on the geographic and neighborhood landscapes they are situated in. Furthermore, this work highlights how highly disadvantaged Black neighborhoods may experience weaker positive associations between places of worship and crime, and points to the importance of exploring how disadvantage moderates the religion-crime association more broadly. This study also points to the importance of including religious institutional presence as a measure when examining religion-crime relationships to pick up on the methods by which religion is situated within the ecology of one's environment. The impacts of this research go beyond the walls of academia and can provide significant information for communities and insight into their cultivation. Crime prevention advocates may benefit from this research because of its potential to display the unique effects of religious meeting spaces on crime rates, and law enforcement agencies may find it useful to engage with these religious organizations for crime reduction. Religious organizations may also find this research beneficial in understanding the unique institutional power they possess within their local communities, especially regarding moral and social guidance. The findings and contributions of the present study indicate the importance of continuing to explore the religion-crime relationship and its importance to the fields of religion, race and ethnicity, urban sociology, criminology, and community studies. Accordingly, future research should consider this work when doing so.

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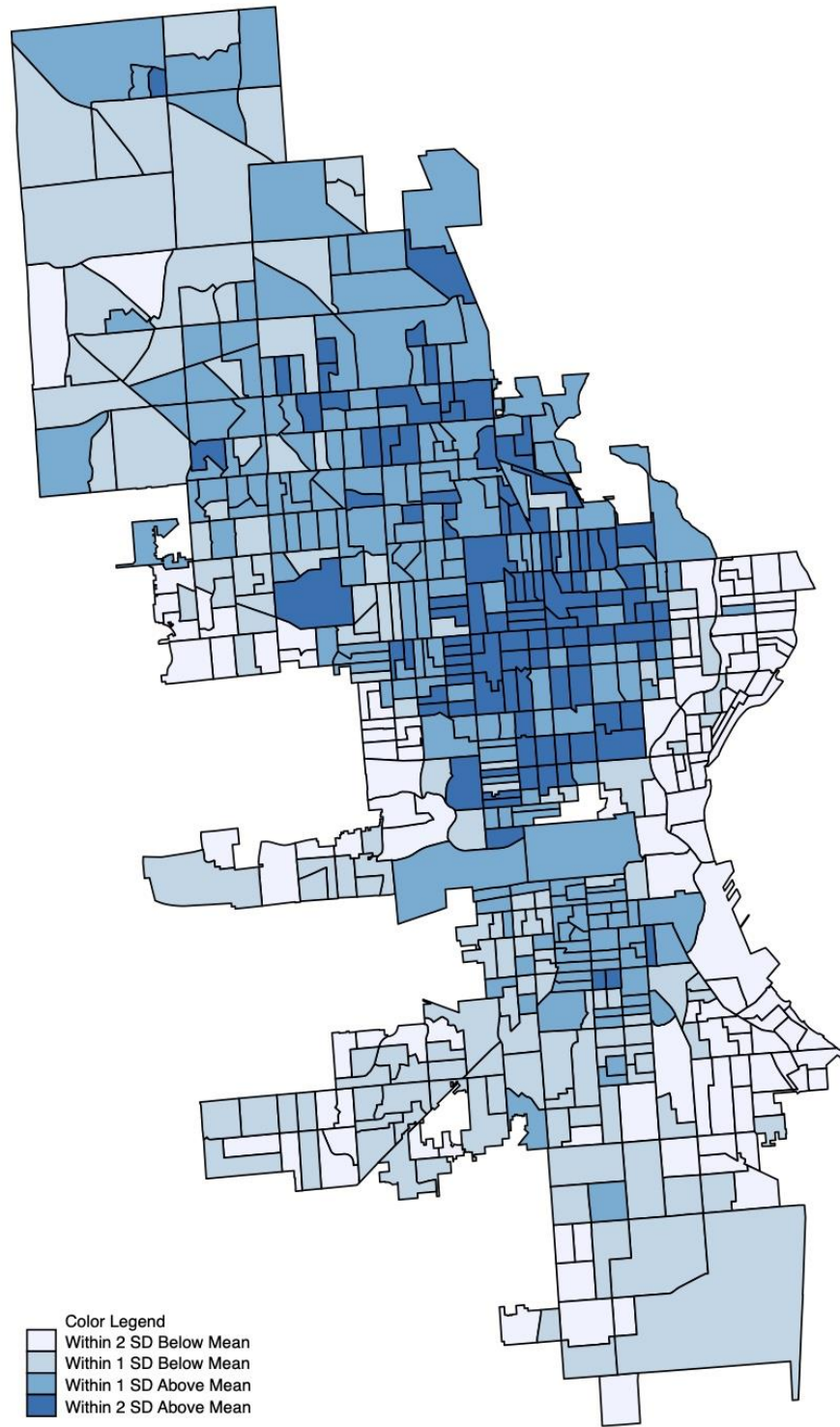
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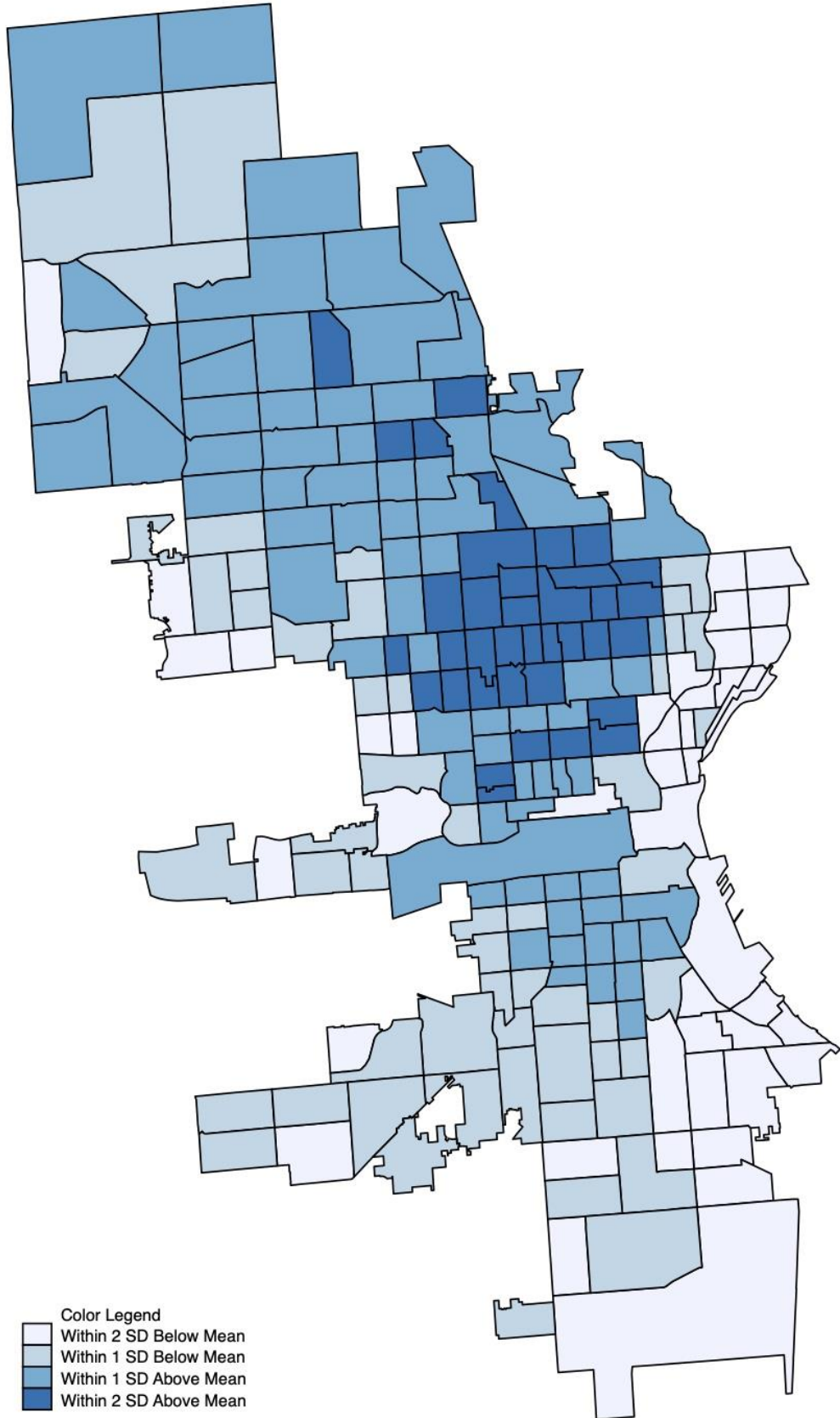
# Appendix A: Maps of Disadvantage, Immigration, Violent Crimes, and Property Crimes

Levels of Disadvantage Across Milwaukee Census Block Groups, by Standard Deviation



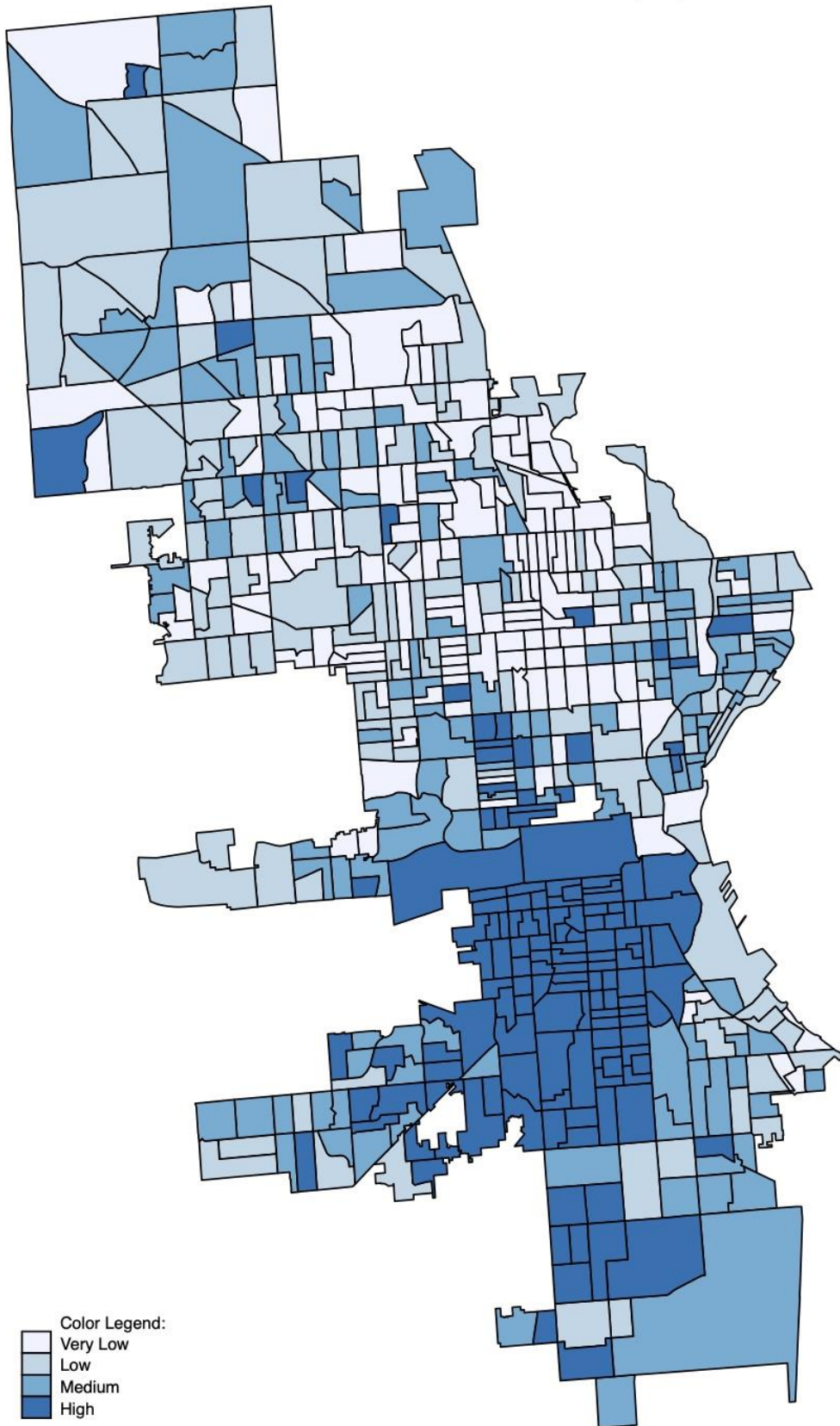
Note: Mean = 0 Based on Disadvantage PCA Index Measure

Levels of Disadvantage Across Milwaukee Census Tracts, by Standard Deviation



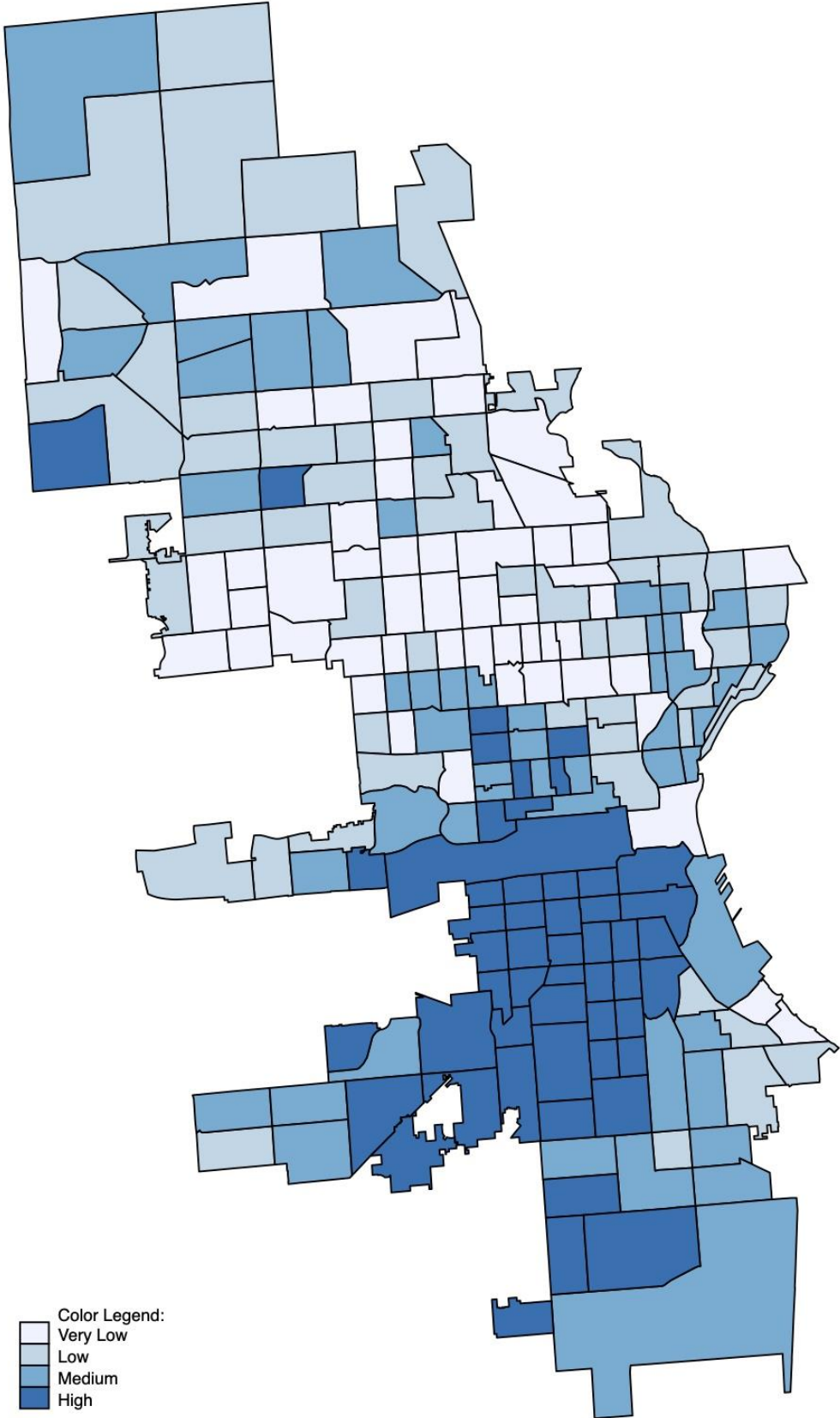
Note: Mean = 0 Based on Disadvantage PCA Index Measure; SD = Standard Deviation

Levels of Immigration Across Milwaukee Census Block Groups, by Quantile



Note: Mean = 0 Based on Immigration PCA Index Measure

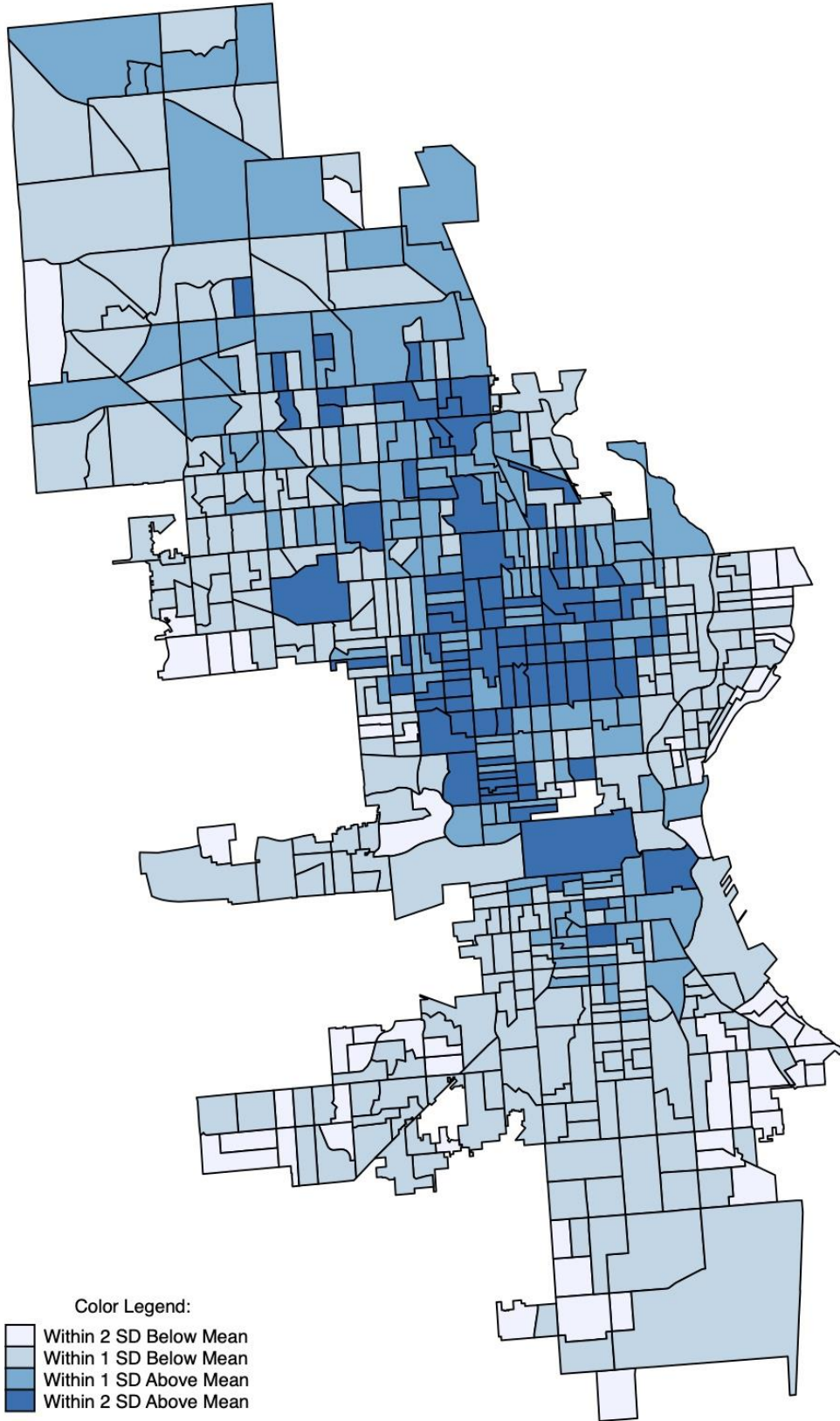
Levels of Immigration Across Milwaukee Census Tracts, by Quantile



Color Legend:  
Very Low  
Low  
Medium  
High

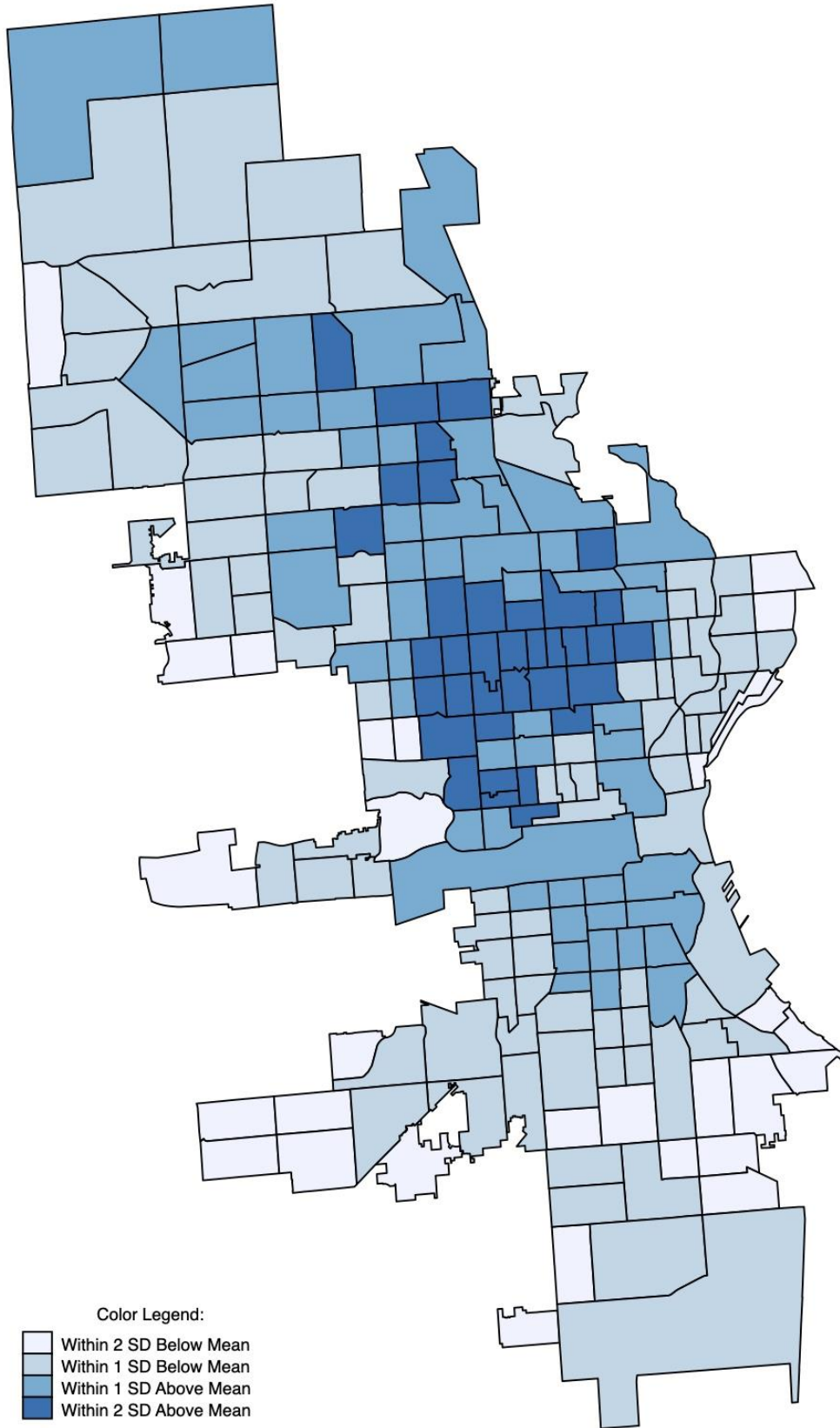
Note: Mean = 0 Based on Immigration PCA Index Measure

Distribution of Violent Crime Rates Across Milwaukee Census Block Groups, By Standard Deviation



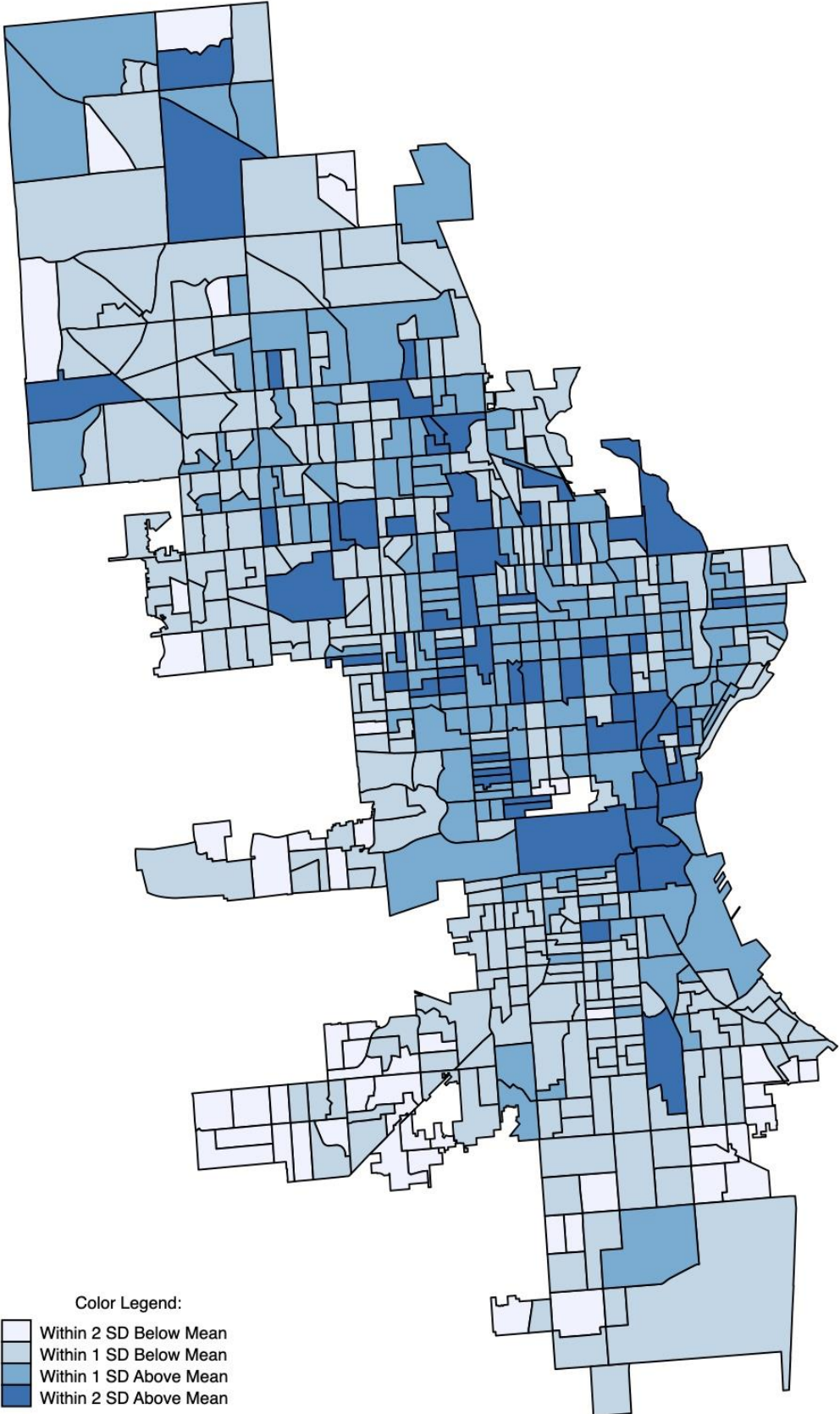
Notes: Violent Crime Rate = (# of Violent Crimes / Block Group Population) x 1,000; Mean = 80.72

Distribution of Violent Crime Rates Across Milwaukee Census Tracts, By Standard Deviation



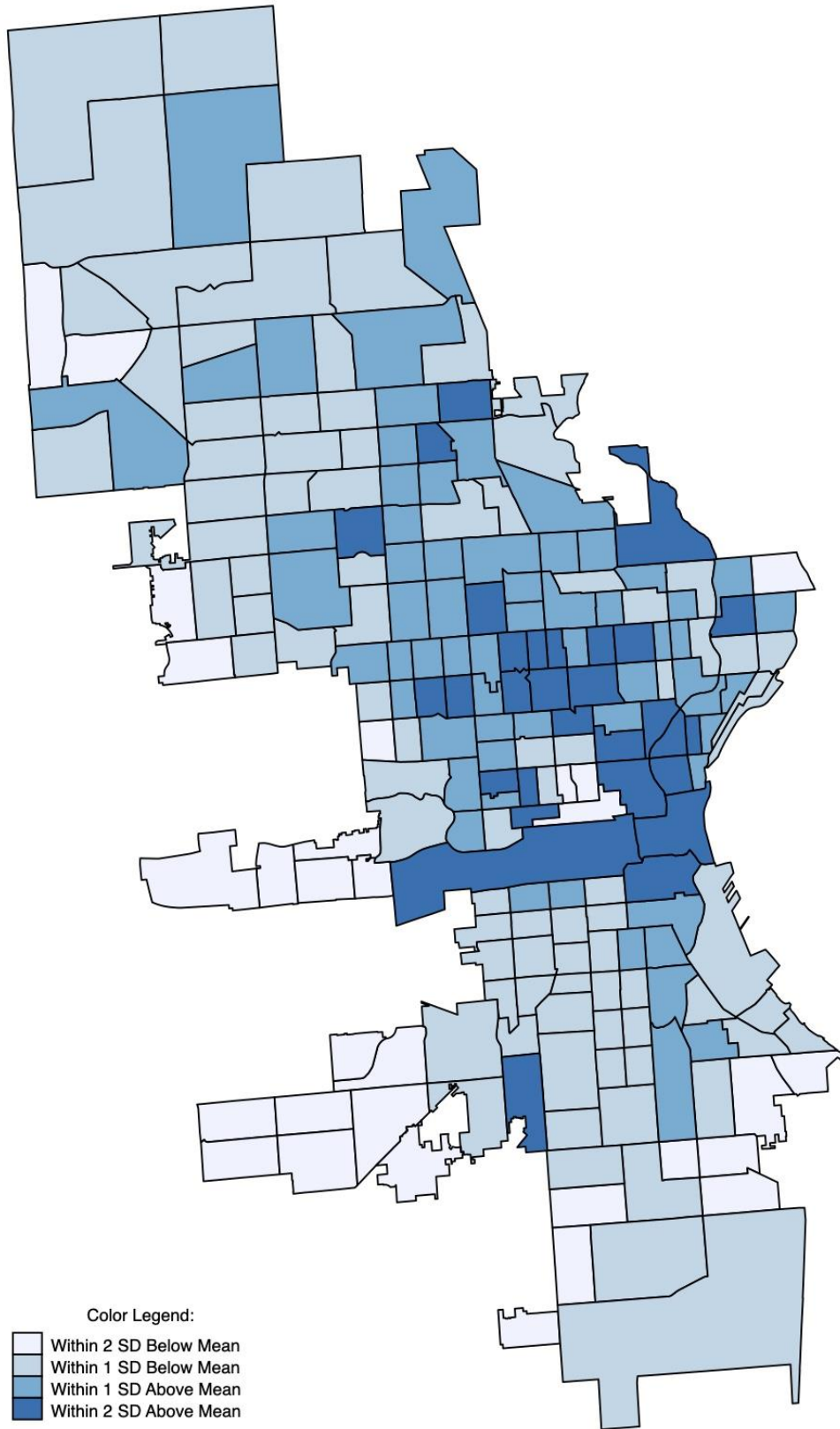
Notes: Violent Crime Rate = (# of Violent Crimes / Tract Population) x 1,000; Mean = 76.19

Distribution of Property Crime Rates Across Milwaukee Census Block Groups, By Standard Deviation



Notes: Property Crime Rate = (# of Property Crimes / Block Group Population) x 1,000; Mean = 115.95

Distribution of Property Crime Rates Across Milwaukee Census Tracts, By Standard Deviation



Notes: Property Crime Rate = (# of Property Crimes / Tract Population) x 1,000; Mean = 112.49

Appendix B: Graphs of Predictive Margins for Two-Way and Three-Way Interactions

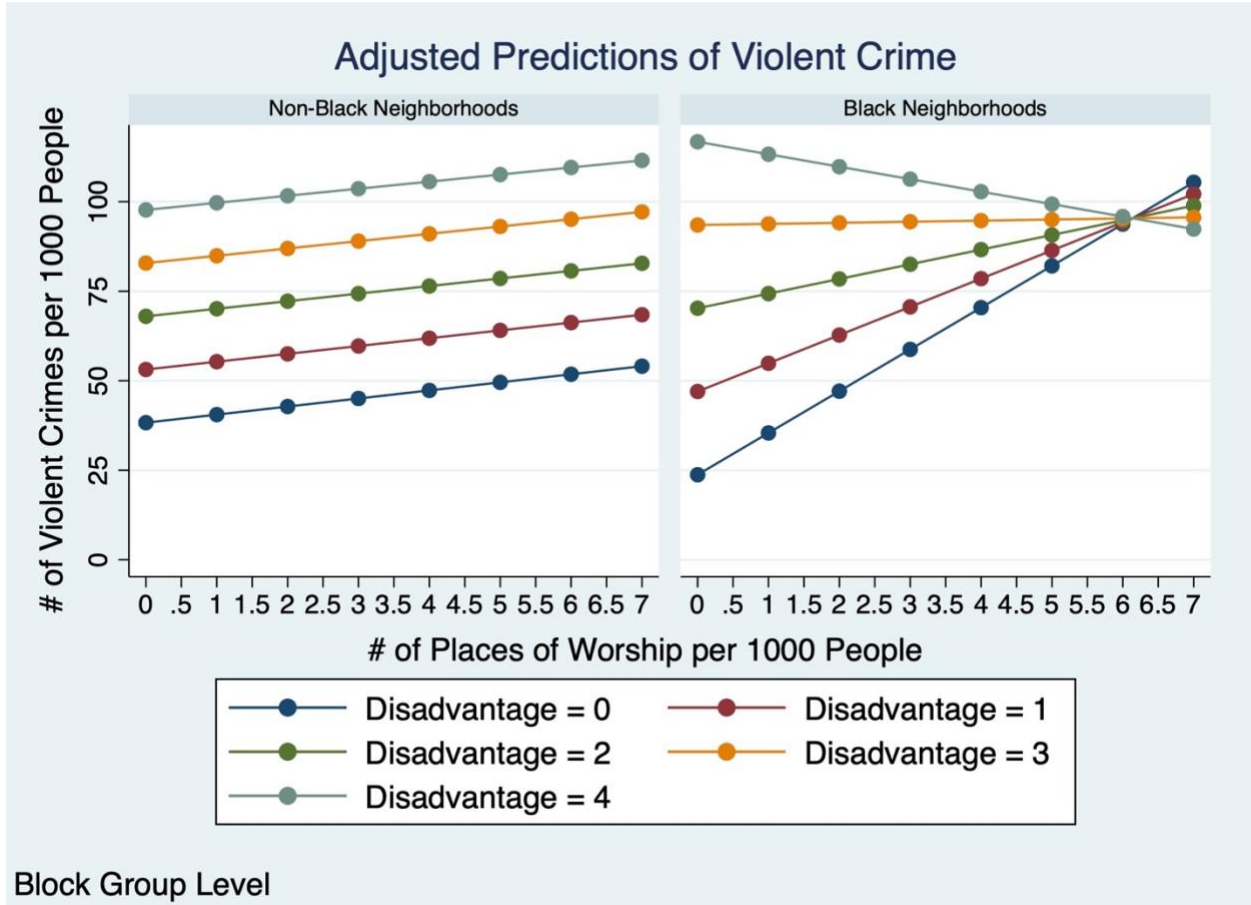
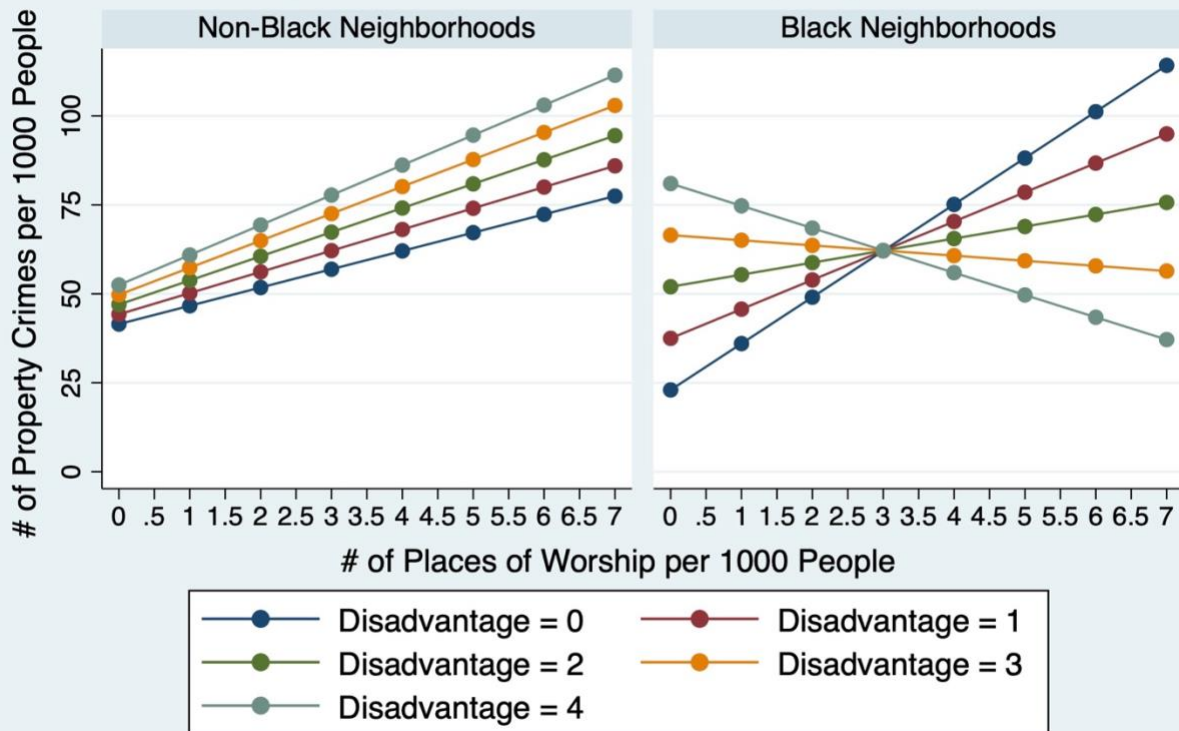


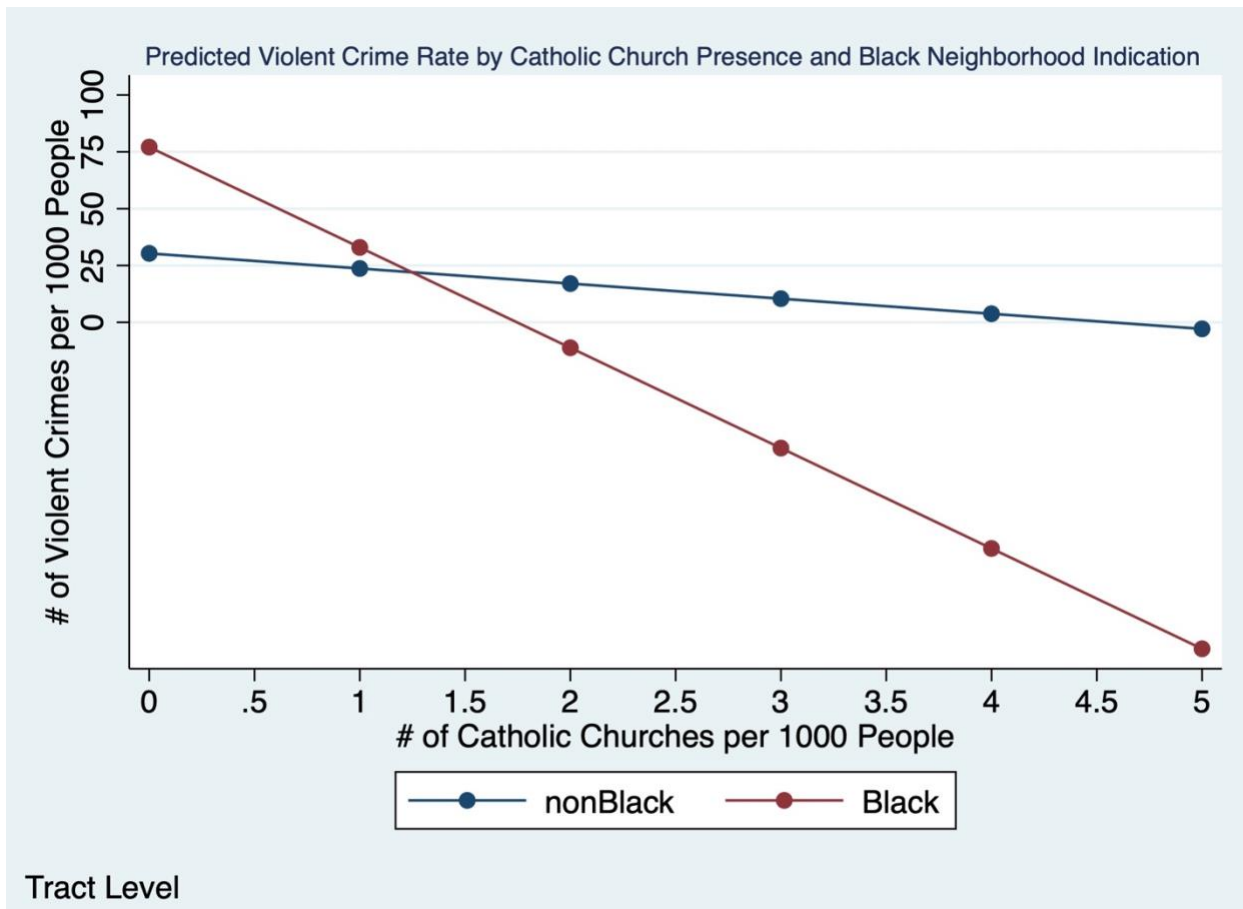
Figure 1: Adjusted Predictions of Violent Crime; SAR Model of Violent Crime with Place of Worship x Black Neighborhood (Block Group) x Disadvantage Interaction

## Adjusted Predictions of Property Crime



### Block Group Level

Figure 2: Adjusted Predictions of Property Crime; SAR Model of Property Crime with Place of Worship x Black Neighborhood (Block Group) x Disadvantage Interaction



Tract Level

Figure 3: Predicted Violent Crime Rate by Catholic Church Presence and Black Neighborhood Indication

<sup>i</sup> In the context of this study, I utilize Glock and Stark’s (1965) conceptualization of religiosity, which Holdcroft (2006) details as possessing 5 different dimensions: experiential (personal faith), ritualistic (the worship experiences one engages with in a community), ideological (the standards one will adhere to in terms of their beliefs), and intellectual (developing and maintaining knowledge of one’s religious beliefs).

<sup>ii</sup> This information and more can be found within the Technical Overview published by Data Axle Reference Solutions: <https://referencesolutions.data-axle.com/wp-content/uploads/2020/09/all-business-databases.pdf>

<sup>iii</sup> Data for Milwaukee places of worship was retrieved on March 7<sup>th</sup>, 2023, and re-checked on March 14<sup>th</sup>, 2023.

<sup>iv</sup> IPUMS National Historical GIS. <https://www.nhgis.org>

<sup>v</sup> GISJOIN Identifiers. <https://www.nhgis.org/geographic-crosswalks>

<sup>vi</sup> American Community Survey (ACS) Information Guide. [https://www.census.gov/content/dam/Census/programs-surveys/acs/about/ACS\\_Information\\_Guide.pdf](https://www.census.gov/content/dam/Census/programs-surveys/acs/about/ACS_Information_Guide.pdf)

<sup>vii</sup> Wisconsin: Response Rates and Reasons for Noninterviews (in percent) — Housing Units <https://www.census.gov/acs/www/methodology/sample-size-and-data-quality/response-rates/index.php>

<sup>viii</sup> Milwaukee County Census Tracts.

[https://www2.census.gov/geo/maps/DC2020/PL20/st55\\_wi/censustract\\_maps/c55079\\_milwaukee/DC20CT\\_C55079.pdf](https://www2.census.gov/geo/maps/DC2020/PL20/st55_wi/censustract_maps/c55079_milwaukee/DC20CT_C55079.pdf)

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<sup>ix</sup> Milwaukee Census Tract Map by Zip Code:

[https://city.milwaukee.gov/ImageLibrary/Groups/cityDCD/planning/data/pdfs/census\\_zipcode.pdf](https://city.milwaukee.gov/ImageLibrary/Groups/cityDCD/planning/data/pdfs/census_zipcode.pdf)

<sup>x</sup> Violent and Property Crime Definitions can be found on the United States Government, Department of Justice's Websites: <https://nij.ojp.gov/topics/crimes/violent-crime> , <https://nij.ojp.gov/topics/crime/property-crimes>

<sup>xi</sup> Additionally, not all places of worship have online presences such as websites or official Facebook pages that provide information about their denominational affiliation or decision to not affiliate with a denomination. Providing these places of worship with their own category avoids making biased assumptions for these places of worship.

<sup>xii</sup> The % Black variable was originally included as a separate control in the models. However, due, to high collinearity with the Black tract indicator variable, it was instead including within the neighborhood disadvantage measure. The inclusion of a % Black variable in neighborhood disadvantage measures tends to be the case for prior research (see Harris and Ulmer, 2017; Warner and Konkel, 2019).

<sup>xiii</sup> Map of the Archdiocese of Milwaukee's churches, parishes, and schools within and around Milwaukee County.

<https://www.archmil.org/ArchMil/Resources/COMM/ArchdioceseofMilwaukeeMAPS-reducedsize-Reduced.pdf>

<sup>xiv</sup> Archdiocese of Milwaukee: Office of Social Justice Ministry. <https://www.archmil.org/offices/social-justice.htm>