RACIAL RESIDENTIAL SEGREGATION AND ACCESS TO HEALTH CARE COVERAGE: A MULTILEVEL ANALYSIS

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CHAPTER I

INTRODUCTION

Significant differences in health outcomes exist between racial and ethnic groups in the United States. African Americans in particular have the lowest health status of all racial and ethnic groups, and they experience some of the most detrimental health outcomes and environments of any group since the foundation of the United States, especially when compared to Whites (Byrd and Clayton 2001, 2002; Patterson 2009). Disparities are not just a product of past slavery, but continue to today, 146 years after the abolition of slavery and 47 years after the Civil Rights Act of 1964. Most notably, mortality statistics show that Blacks are 30% more likely to die from heart disease and cancer compared to Whites, and six times more likely to die from homicide (Williams and Jackson 2005). Black Americans also face a number of exacerbated health problems compared to their White counterparts throughout the life course. Additionally, African Americans are less likely to have access to adequate health care, and are more likely to receive inappropriate

care (Byrd and Clayton 2002; Shavers and Shavers 2006). While legal forms of systematic discrimination were outlawed, significant disparities in life chances persist, including health and health care outcomes.

A growing body of literature focuses on documenting the differences in health and health care access among racial groups in the United States. Researchers in this field consider several approaches for understanding why health disparities exist. More recently, this research emphasizes the mechanisms of racism as it relates to health and health care. Several previous studies consider residential segregation as a form of structural racism to view its impact on a variety of health indicators. However, few have undertaken to study the role that health care access plays in these health disparities.

In this study, I examine how racial residential segregation impacts health care access. Access to health care is the leading indicator of a population's health status (U.S. Department of Health and Human Services 2000). A number of factors determine an individual's access to adequate health care, including economic concerns, health care education, and geo-spatial factors. With this study, I specifically examine access to health insurance, the main gateway to accessing full and sufficient medical care in the United States. It is increasingly more difficult for Americans in general to access care due to the rising costs of health care and in turn health insurance. I posit that racism, in particular residential segregation, exacerbates these problems for the Black community. Furthermore, problems of health care access may be a strong explanatory factor for the Black-White health gap in the United States.

I ask, is residential segregation related to reduced health care access? More specifically, I will first examine the impact of residential segregation on access to health

care for Black respondents asking: Are Black residents of segregated cities less likely to have health care coverage compared to Black residents of less segregated cities? In essence, does the level of segregation of a city affect the ability of Black residents of such cities to obtain health care coverage? To address this first research question, I examine data from Black residents drawing on Massey and colleagues' geographic concentration of poverty theory of segregation. My hypothesis is that racial residential segregation is related to decreased health care access, in that Black individuals living in more highly segregated cities will be less likely to have health care coverage of any type. Related to the first research question, I focus on understanding the mechanisms of how segregation impacts access if such a link exists. I also explore several social and economic factors by which segregation may limit access to adequate health insurance. Based on Massey and colleagues' work on the effects of concentrated poverty, I developed three hypotheses detailed below, intended to account for the effect of residential segregation on access to care. I hypothesize that segregation, as it concentrates poverty and the social problems associated with poverty, will affect access to health care coverage through reduced educational opportunities, social breakdown, and limited economic opportunity.

The second research question I address goes beyond the within-group analysis of segregation for the Black community, examining the differences between Blacks and Whites in health insurance. I ask: How does residential segregation affect the Black-White gap in health care coverage? To answer this second research question, I examine and compare data from both Black and White residents. I hypothesize that because segregation buffers the racially dominant White group from the effects of concentrated poverty in segregated areas, White residents of segregated cities will not be subject to any

potentially negative effects of racial residential segregation, therefore contributing to the Black-White gap in health care coverage.

CHAPTER II

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

Geographic Concentration of Poverty Theory of Segregation

While many explanations of why racial differences in health exist and persist, this research focuses on the role of racial residential segregation as a form of systematic racism in creating a variety of social inequities, including disparities in health and health care access. The theoretical basis of this study is rooted in Massey and colleagues' geographic concentration of poverty theory of segregation (Massey 1990; Massey and Denton 1993; Massey and Fischer 2000). Residential segregation is the "separation of groups by enforced residence in different areas" (Ahmed, Mohammed, Williams 2007:319). While residential segregation is no longer legally enforced, it remains an important and persistent part of the racial landscape of the United States. As such, Massey and Denton argue that it serves as an "institutional apparatus that supports other racially discriminatory processes and binds them together into a coherent and uniquely

effective system of racial subordination" (1993:8). Massey and colleagues argue that as a system of racial subordination, segregation serves to concentrate poverty and the social problems that accompany poverty into one spatial area of a city and within one racial group (Massey 1990; Massey and Denton 1993; Massey and Fischer 2000).

As a mechanism of racism, residential segregation has important consequences for those living in segregated areas. In several works by Massey and his colleagues, they develop their theory of how racial residential segregation can compound neighborhood-level poverty (Massey 1990; Massey and Denton 1993; Massey and Fischer 2000). Their overarching theoretical argument is that as poverty is more highly concentrated in the Black population of the United States, when Blacks are geographically concentrated in one area of a city, poverty and the effects of poverty are also concentrated within that group (Massey and Denton 1993; Massey and Fischer 2000). Conversely, they demonstrate that as poor Whites are much more evenly distributed throughout society, the effects of White poverty are also more evenly distributed (Massey and Denton 1993). Massey and Denton (1993) model how poverty becomes concentrated using simulations of cities with varying levels of segregation. Through these simulations, they demonstrate that as segregation increases, the poverty rate within the segregated portion of the city also increases, which additionally spatially buffers the non-segregated group from poverty and its social effects (Massey and Denton 1993). Furthermore, when social class, in addition to racial segregation, was added to the hypothetical simulations, the effect of concentration of poverty becomes even more severe (Massey and Denton 1993). Massey and Denton (1993) also take an historical look at this issue. They note that during times of economic downturn, namely the 1930's and the 1970's that the effects of poverty were

amplified in urban Black, segregated areas (Massey and Denton 1993). Although the economic effects during these times were widespread for both Black and White communities, the effects were intensified for the Black communities which were spatially isolated (Massey and Denton 1993). Massey and Fischer (2000) further develop this theory by examining this effect empirically using U.S. Census data over time. Their findings support the concentration of poverty theory, and reveal that the effects of poverty over time were stronger for racial groups subject to high rates of racial segregation.

Furthermore, Massey and Denton (1993) assert that the concentration of poverty within Black segregated neighborhoods then produces a variety of social problems and the "creation of an underclass." Their concentration of poverty theory contends that, "because of racial segregation, a significant share of Black America is condemned to experience a social environment where poverty and joblessness are the norm, where the majority of children are born out of wedlock, where most families are on welfare, where educational failure prevails, and where social and physical environment deterioration abound" (Massey and Denton 1993:2). The effect of segregation is not merely limited to the concentration of poverty, but poverty is always accompanied by a number of social problems resulting from economic disenfranchisement (Massey and Denton 1993). Furthermore, like poverty, the resulting social ills are geographically and spatially concentrated and continually reproduced within a specific community (Massey and Denton 1993).

In contrast to Massey and colleagues' theory of concentrated poverty is the work of William Julius Wilson, which is similar in many ways, but emphasizes the impact of

social class and economic changes instead of residential segregation as the main source of the problems of poverty in Black neighborhoods (Wilson 1987, 1996). Wilson argues that changes in the structure of the American economy and the out-migration of middle-class Blacks created Black, urban ghettos whose residents experience extreme poverty, joblessness, and a variety of social problems, such as family breakdown, crime, and drug use (1987, 1996). Recent work on the subject has attempted to provide empirical evidence on both sides of this debate. Iceland and Wilkes (2006) found that while socioeconomic status has increased in importance when explaining Black-White segregation and the resulting outcomes over time, residential segregation itself remains an important aspect of race relations between Blacks and Whites more so than any other group. Furthermore, Cooke (1999) demonstrates that segregation itself is an important aspect of concentrated urban poverty, but he also argues that the location and type of city is central to this debate. He found that concentrated poverty was more closely linked to economic opportunity as Wilson suggests in large manufacturing cities located primarily in the Northeast and Midwest (Cooke 1999).

However, other studies provide ample evidence for Massey and colleagues' theory that residential segregation, as a form of structural racism, is central to the concentration of poverty in Black communities in the United States. Massey, Gross, and Shibuya (1994), in direct contention to Wilson's argument, found that high-SES Black out-migration did not affect concentrated poverty as all Blacks were subject to segregated housing markets. They note that poor Blacks have the fewest housing options and live in the most disadvantaged neighborhoods, but that nonpoor Blacks are also "less able to escape living in poor neighborhoods than are nonpoor members of other groups"

(Massey, Gross and Shibuya 1994:443). Moreover, Krivo, Peterson, Rizzo and Reynolds (1998) provide further support for Massey and colleagues' argument by examining what they term "concentrated disadvantage" using data from 1980-1990. They found that while economic conditions, such as joblessness, remained relatively stable over the ten year period, concentrated disadvantage for Blacks actually increased (Krivo et al. 1998). Thus, although no major economic changes took place, poverty and the problems associated with it became more severe for the Black community, which lends support to Massey and colleagues' theory (Krivo et al. 1998). Thus, the theoretical basis of this study is grounded in Massey and colleagues' assertion that the concentration of poverty observed in Black communities in the United States stems from unabated residential segregation, which geographically isolates the Black community, and furthermore buffers White Americans from the effects of poverty concentration. More specifically, this study applies these arguments to the impact of poverty concentration on access to health care. A robust literature empirically examining the resulting social problems from the geographic concentration of poverty is reviewed here and informs the present study on access to health care

Institutional, Social and Economic Outcomes of Residential Segregation

Before examining the literature on the outcomes of segregation, it is important to note here that residential segregation has not occurred by accident or by the unconstrained residential choices of African Americans. Segregation is a product of racism and of White design to maintain social distance from African Americans (Massey and Denton 1993). Segregation was legal and pervasive in the first half of the twentieth

century. While segregation declined somewhat since the Civil Rights Movement and the Fair Housing Act of 1968, the numbers remain surprisingly high (Massey and Fischer 2000). Studies show that, while no longer legal, discrimination in housing continues, and that Black residence in White neighborhoods is discouraged in overt and covert forms (Massey and Denton 1993). Additionally, White flight occurs when a neighborhood becomes "too Black" because of underlying racial assumptions by Whites (Shihadeh and Flynn 1996). My analysis here is not meant to suggest that African Americans are to blame for segregation and its effects. Rather, segregation is a White invention and a product of structural, institutionalized racism which produces real consequences for the Black communities of the United States.

The literature on residential segregation demonstrates a number of the neighborhood conditions of segregation that Massey and Denton argue result from the geographic concentration of poverty. First, segregation has been shown to have profound effects on socioeconomic status and can limit upward mobility. This is most evident in the educational opportunities presented in segregated neighborhoods. The educational system in the United States delineates school zoning and funding by residence. Therefore, children in segregated areas have disproportionately low access to quality education (Collins and Williams 1999; Hummer 1996). They attend schools which are poorly funded, and because of the school's locations, attract less qualified teachers. Education is an important determinant of upward mobility, and poor educational quality results in the persistence of lower socioeconomic status in these areas.

Available employment opportunities also affect socioeconomic status in segregated communities. Unemployment rates are higher in segregated areas due to

lower availability, quality and earnings from jobs in these areas (Collins and Williams 1999; Wilson 1996). Studies show that in recent decades even lower-skill manufacturing jobs have moved away from segregated areas, preferring suburban and rural locations (Ahmed, Mohammed and Williams 2007; Wilson 1996). Companies examine the racial make-up of the area to locate or relocate their facilities. The concentration of poverty in these areas also leads to a lack of economic and social capital, limiting opportunities to seek out new and more diverse jobs (Krivo et al. 1998; Wilson 1996). High levels of unemployment also produce consequences for the upward mobility of future generations as patterns of joblessness are modeled to younger generations (Wilson 1996).

These forms of economic deprivation also lead to an increase in social disorder. The concentration of poverty that segregation produces can cause an increase in family breakdown, criminal activity, and drug and substance abuse. Because of these economic factors and in particular male joblessness, segregated neighborhoods have higher concentrations of female-headed households (Testa, Astone, Krogh, and Neckerman 1993). Segregation can also lead to social breakdown and can reduce the quality and quantity of social ties and social participation (Shihadeh and Flynn 1996). The concentration of poverty and marginalized status in segregated neighborhoods attracts crime in its various forms, including violent crime and homicide (Greenberg and Schneider 1994). Segregated neighborhoods then become invaded by drug dealers and users, the homeless, midnight dumpers, and other forms of illegal and socially marginal activities (Greenberg and Schneider 1994). The conditions created by such social disorder also drive out police and fire services rather than attract them (Greenberg and

Schneider 1994). As it relates to this research, all of these forms of social breakdown can have serious health and safety implications.

Segregation also leads to a variety of environmental harms that can exacerbate poverty and unhealthy living conditions. Segregation and economic deprivation may lead to physical disorder, such as poorer housing quality, decreased access to services, housing code violations, vacant lots, broken windows, litter, graffiti, and abandoned buildings (Chang, Hillier and Mehta 2009; Keizer, Lindenberg and Steg 2008; Shihadeh and Flynn 1996). Studies also show that once physical disorder is present, it can lead to more physical and social disorder (Keizer, Lindenberg and Steg 2008). All of these present hazardous and unsafe living conditions. Furthermore, people living in segregated areas tend to pay more for these lower-quality goods, services and housing (Williams 1999).

In addition to physical disorder, segregated areas also tend to lack park and recreational space. This leads to an absence of safe, outdoor public space for people to meet and play, which can facilitate community breakdown and affect the types of activities that children and young people pursue. This also has obvious health effects since without park spaces within neighborhoods, people, including children, are much less likely to exercise. Segregated neighborhoods are also the target of a number of environmental harms as evidenced in the environmental justice literature whereby segregated neighborhoods often suffer more exposure to environmental harms and toxins, as Black neighborhoods have been a target for a variety of hazards such as industrial factories and waste facilities (Bullard 2005).

Segregation can also have serious consequences for nutritional behaviors, which can have a huge impact on community health. Segregation limits access to nutritional foods and increases access to junk foods and harmful substances such as tobacco, alcohol and drugs. Segregated areas also lack large supermarkets, which provide a cheaper and more diverse food selection, including fruits and vegetables, than small convenience stores. This can lead to health problems associated with nutrition, such as diabetes and heart disease (Bahr 2007; Chang, Hillier and Mehta 2009; Grier and Kumanyika 2008; Kwate 2008; Larson, Story and Nelson 2009). Fast food companies also target segregated neighborhoods, offering lower quality food with poor nutritional standards (Kwate 2008; Larson, Story and Nelson 2009). Additionally, the communities are targeted by liquor stores, which can increase alcohol abuse, affect health, and lead to further social disorder (LaVeist and Wallace 2000). All of the impacts of segregation discussed here can lead either directly or indirectly to negative health consequences, and the recent research on the effects of segregation has uncovered some of those health effects.

Segregation and Health

Issues related to segregation play a central role in much of the work on racial health disparities. The literature reviewed above considers obvious health implications, such as environmental hazards and physical disorder which reduce access to safe, green space for recreation and exercise, lack of adequate spatial access to nutritional foods, and an increased access to foods of poor nutritional quality through convenience stores, fast food restaurants, and liquor stores. Many recent studies highlight the role of these factors

in creating health problems in segregated neighborhoods (Bahr 2007; Bullard 2005; Chang, Hillier and Mehta 2009; Grier and Kumanyika 2008; Kwate 2008; Larson, Story and Nelson 2009; LaVeist and Wallace 2000; Shihadeh and Flynn 1996; Williams 1999).

Furthermore, many researchers have directly examined the impact of residential segregation on health. Such scholarship tends to focus on mortality and life expectancy, infant mortality rates, birth weight, and overall health (Hummer 1996). Analysts have documented Black-White differences in mortality for a number of causes of death (Collins 1999; Collins and Williams 1999; Hart, Kunitz, Sell and Mukamel 1998; LeClere, Rogers and Peters 1997; Polednak 1991; Polednak 1997). Mortality studies on the effects of segregation are the most numerous studies on the effects of segregation on health, as it is the most definitive health outcome, and the outcome for which data is more readily available. These studies found a strong association between racial residential segregation and higher mortality rates for various causes of death, including causes amenable to medical intervention (Collins 1999; Collins and Williams 1999; Hart et al. 1998; LeClere, Rogers and Peters 1997; Polednak 1991; Polednak 1997). Others highlight the effect of segregation on infant health and mortality (Ellen, Cutler and Dickens 2000; Grady 2006; Hearst, Oakes and Johnson 2008). These studies demonstrate a higher incidence of infant mortality in segregated neighborhoods (Hearst, Oakes and Johnson 2008; Polednak 1991), as well as much higher rates of low birth-weight, which is an important indicator of poor health throughout the life course (Ellen, Cutler and Dickens 2000; Grady 2006). Furthermore, other studies have examined overall health, and they found that residents of segregated neighborhoods are more likely to report being in poorer health (Acevedo-Garcia 2000; Do, Finch, Basurto-Davila, Bird,

Escarce and Lurie 2008; Subramanian, Acevedo-Garcia and Osypuk 2004; Williams and Collins 2001). Finally, several additional studies have analyzed the impact of segregation on nutrition and obesity, emphasizing the structural sources of poor nutrition in segregated neighborhoods leading to higher rates of obesity (Chang 2006; Chang, Hillier and Mehta 2009; Kwate 2008; Larson, Story and Nelson 2009).

Segregation and Health Care

Although many studies have examined the effect of residential segregation on the health of the Black community, few studies have examined the differences in health care access and health care use as a result of segregation. The present study argues that because poverty becomes concentrated in segregated areas, that Black residents of segregated cities will be less likely to have health care coverage of any kind. In the United States, health care is increasingly difficult for people in general to access because of sharply rising costs and the lack of a universal coverage system. With this research, I posit that as residential segregation concentrates the effects of poverty, it contributes to the difficulty of the Black community to obtain adequate health care. Furthermore, this connection could help contribute to our understanding of the Black-White health gap in the United States. As health care access is so intimately tied to health outcomes, segregation's effect on health care access may be a strong explanatory factor for the association between segregation and negative health outcomes.

The current, albeit limited, literature on segregation and health care demonstrates that the relationship between racial residential segregation and health care access is multi-faceted. Segregation may present barriers to accessing adequate care due to lack of

access to the system, as well as lack of access within the health care system. First, segregation may limit access to the health care system initially because of the economic and educational factors as described above. Sufficient health care is expensive and because of the concentration of poverty in these areas, access may be limited due to economic forces (Williams and Collins 2001). Additionally, most Americans receive health insurance through their places of employment, and because of the higher rates of unemployment and job instability in segregated areas, they may be less likely to have access to health insurance in that capacity. Also, due to lower rates of educational attainment, people may be less informed of the need to access medical care, especially preventative care (Kposowa 2007). Furthermore, medical facilities are less likely to be located in or near segregated neighborhoods, which creates a physical barrier to access. This is especially true of more advanced or specialty facilities (Hayanga, Kaiser, Sinha, Berenholtz, Makary and Chang 2009; Hayanga, Waljee, Kaiser, Chang and Morris 2009; Rodriguez, Sen, Mehta, Moody-Ayers, Bacchetti and O'Hare 2007). This barrier to health care access may also be exacerbated if the individual does not have adequate transportation. The health facilities located in segregated neighborhoods also tend to be worse in quality with fewer resources (Smith, Feng, Fennel, Zinn and Mor 2007).

Black residents of segregated areas may face additional barriers to health care even within the system. Studies show that African Americans receive worse care on average than their White counterparts and express less satisfaction with their care (Clarke, Davis and Nailon 2007; Kposowa 2007; Nelson 2003; Sarrazin, Campbell, Richardson and Rosenthal 2009). Studies indicate that Black physicians are more competent in delivering care to Black populations, Black physicians see a

disproportionate amount of lower income and Black patients compared to White doctors, Black physicians are more likely to locate their offices in underserved segregated areas, and Black patients express more satisfaction in their care when seen by a Black physician (Komaromy, Grumbach, Drake, Vranizan, Lurie, Keane and Bindman 1996; Lopez, Vranceanu, Cohen, Betancourt and Weissman 2008; Moy and Bartman 1995; Saha, Komaromy, Koepsell and Bindman 1999). However, structural barriers persist, which prevent African Americans from entering prestigious health professions, and African American health care workers often experience discrimination after they enter the profession (Byrd and Clayton 2001). Additionally, racial segregation persists within and across health care facilities, especially long-term health facilities (Clarke, Davis and Nailon 2007; Sarrazin et al. 2009; Smith et al. 2007).

Only two studies have examined the impact of residential segregation on an individual's ability to access health care, which is the emphasis of this research. The first study found that Black and Hispanic respondents living in counties with a higher percentage of the same racial or ethnic group were less likely to perceive barriers to access to care (Haas, Phillips, Sonneborn, McCulloch, Baker, Kaplan, Perez-Stable and Liang 2004). They found a result opposite to what is hypothesized here. However, they were examining variation in health care access by the percentage of racial and ethnic groups in each county, rather than examining how those groups are distributed throughout a county, such as with a segregation score (Haas et al. 2004). Another study, conducted by Gaskin, Price, Brandon and LaVeist (2009), found an association between neighborhood racial integration and an increased likelihood of Black residents of those areas to have a health care visit. This fits with the prior research on segregation and

health, and contributes to our understanding of how segregation can impact health care (Gaskin et al. 2009). However, their analysis of an integrated neighborhood only involved one area in Baltimore, MD (Gaskin et al. 2009). Multiple single-city studies or nation-wide studies would be necessary to systematically examine the relationship between segregation and access to health care. This study seeks to contribute to this growing body of literature by examining a different individual-level outcome of health care access, access to health care coverage.

Analytical Framework

This study examines one main outcome for assessing segregation's impact on health care access, access to health care coverage or insurance. I use a national sample of survey respondents and a segregation index to examine the specific impact of residential segregation. Specifically, I examine health care coverage because it is the fundamental starting point for accessing health care in the United States. Many health researchers have proposed that equal access to health insurance, or universal coverage, would eliminate many of the social sources of health care access disparities (Andrulis 1998; Hoffman and Paradise 2008). Racial and ethnic minorities make up a disproportionate amount, over 50%, of the uninsured in the United States (Hoffman and Paradise 2008). People without insurance are less likely to have access to the entire health care system. They are less likely to have a usual source of care when needed, less likely to access and use preventative care, more likely to have unmet health needs, and less likely to properly manage chronic health conditions (Hoffman and Paradise 2008). Furthermore, those without health care coverage experience diminished health care outcomes when they are

able to access sources of care (Hoffman and Paradise 2008). They experience higher rates of illness and pain, trips to the emergency room, premature mortality, late-stage cancer diagnosis, and are more likely to experience preventable hospitalizations (Hoffman and Paradise 2008). Thus, having health insurance is an important indicator of accessing health care in the United States, and furthermore experiencing better health care treatment and results.

In this study, I examine the impact of Black-White residential segregation on the ability of Black individuals to obtain health care coverage. As stated above, I have two main research questions to address in this study. Related to my first research question, I examine whether higher rates of segregation affect the ability of Black residents of different metropolitan areas to access health insurance. To test this question, I developed one central hypothesis stated as follows:

Hypothesis 1: Black residents of segregated cities, compared to Black residents of less segregated cities, will have diminished access to health insurance.

Furthermore, related to my first research question, in addition to examining the impact of residential segregation itself, I isolate the negative effects that residential segregation produces, effecting Black residents' ability to access health insurance. Following from Massey and colleagues' concentration of poverty theory, I formulated the following three hypotheses on the sources of differing access to health care as a result of segregation. Although other sources of social problems from the concentration of

poverty are described above, I chose three factors I thought most pertinent to the outcome of health care coverage specifically. My three hypotheses are as follows:

Hypothesis 2: Segregation affects access to health care coverage because it can limit educational opportunities, which can impact upward mobility and access to higher quality occupations.

Hypothesis 3: Segregation affects access to health care coverage because it can lead to social and family breakdown, which can limit access to health insurance through social and family ties.

Hypothesis 4: Segregation affects access to health care coverage because it can limit economic opportunity, which can reduce access to jobs that provide comprehensive benefits, including health insurance.

First, as detailed above, segregation can impact an individual's ability to access quality education at all levels. Education could increase one's access to health care through improved job opportunities, health care education, and the general upward mobility that education often provides. My first hypothesis is that the negative effects of lower educational attainment in segregated areas, such as lower rates of college education and higher high school dropout rates, could reduce access to health care for individuals in segregated areas.

Second, as shown above, prior research indicates that segregation can compound the problems of social disorder leading to family instability and breakdown. As many people receive health insurance through a spouse or family member, I examine the impact

of family breakdown, through the percentage of married-couple households and female-headed households, as a possible explanatory factor for the impact of residential segregation. My second hypothesis is that lower marriage rates and higher rates of female-headed households in segregated areas can lead to a decrease in access to health insurance.

Finally, because the prior research on segregation demonstrates that there are lower rates of economic opportunity, I examine the impact of these economic factors on segregation and access to health care. As both the access to employment and quality of jobs available are important factors, I will examine income and poverty, unemployment, type of employment available, and union membership, as those jobs more often provide full benefits like health insurance. As many people receive health insurance through their places of employment, my second hypothesis is that Black residents of segregated areas will have reduced access to health care because of higher rates of poverty, unemployment, and lower quality jobs available. This study examines the impact of racial residential segregation on the ability of Black Americans to access health insurance, and additionally examines each of these three hypotheses in an attempt to understand the more specific effect that residential segregation can have on a variety of negative health outcomes.

Moreover, with regards to my second research question, I examine whether segregation affects the ability of Black residents to access health care coverage compared to their White counterparts within the same metropolitan area. For my second research question, I formulated one final hypothesis, which this study examines. The hypothesis is as follows:

Hypothesis 5: Black residents of segregated cities, compared to their White counterparts, will have reduced access to health care coverage.

Although numerous studies have examined race and access to health care, to my knowledge, no work has been conducted thus far using data on a nation-wide scale assessing the impact of racial segregation specifically on access to health insurance. Furthermore, few of the studies that examine race, place, and health care use a true measure of segregation and often just use a measure of the racial make-up of a city or place, which does not directly account for how racial groups are distributed throughout a geographical area. Additionally, no present study uses multilevel methods to examine these issues.

This study contributes to this burgeoning body of literature by examining one of the fundamental barriers to care in the United States, access to health insurance. The specific contribution of this study is that it analyzes two facets of the impact of segregation on access to health care. First, it examines the impact of segregation among Black respondents nationwide considering the differing levels of segregation to assess how segregation can impact access to health insurance for the Black community. Furthermore, under this objective, drawing on the geographic concentration of poverty theory, the study provides insights into the mechanisms by which segregation can affect access to health care for Blacks, by examining educational, social, and economic opportunity factors at the city-level. Second, it compares the impact of segregation for Blacks versus Whites to understand how segregation contributes to the Black-White gap

in health care coverage. This study is also a national, comprehensive study examining segregation, using a score specific to Black residential segregation. Additionally, I use a multilevel statistical method to model this relationship with individual-level health data nested within metropolitan-level data. All of these aspects contribute to filling the important gap in the literature on health care access.

CHAPTER III

DATA AND METHODS

Data

In this study, I examine the effect of a contextual variable (residential segregation) on an individual-level outcome (health care access) while controlling for other independent variables at the individual and contextual levels. Therefore, a multilevel-model is most appropriate. Specifically, I use individual-level health data nested within population data measured at the metropolitan-area level. First, for the level 1 data, I used the 2008 Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is an annual survey conducted by the Centers for Disease Control and Prevention (CDC) to monitor trends in health risk behaviors and illness in the United States. For this study, I used the Selected Metropolitan/Micropolitan Area Risk Trends (SMART) version of the data, which organizes the data geographically by Metropolitan Statistical Areas (MSA) and only includes those areas with 500 or more respondents. One item from the health care access series of questions in the BRFSS was used as the dependent variable in the statistical

models.

Next, I merged the individual-level BRFSS data with data measured at the level of the MSA. MSA-level data including segregation and population variables come from multiple sources. The SMART version of the BRFSS contains a geographic identifier at the MSA level. The MSAs (N=139) are comprised of groups of counties that contain at least one urbanized area of 50,000 or more inhabitants. The original BRFSS data set included identifiers for Micropolitan Statistical Areas, which are areas with a population less than 50,000, but still greater than 10,000. These were not included in this study as level 2 data was not available for these geographic divisions. Additionally, the data set included geographical units called Metropolitan Divisions, which are smaller divisions of particularly large MSAs. I combined some of these areas into the original, larger MSA in order to match the segregation data. MSA-level data was merged with the BRFSS data using the MSA identifier.

As the research on segregation demonstrates that the effects of segregation are concentrated within Black communities, I constructed two separate models for the dependent variable: one for White respondents and one for Black respondents. I divided the data set in this manner using a calculated race and ethnicity variable from the BRFSS data set. The BRFSS includes a question on race and a separate question on Hispanic ethnicity, similar to the United States Census. To separate the two models by race, I used a calculated variable which combines these two race and ethnicity variables with the following response options: non-Hispanic White, non-Hispanic Black, Hispanic, other race and multi-racial. I used this variable in order to only include non-Hispanic Whites in the White model and non-Hispanic Blacks in the Black model. Therefore, for the

dependent variable, I estimated a series of models for Black respondents and an additional series for White respondents, and excluded all others as being outside the scope of this study. For the purposes of analysis of the effect of racial residential segregation for my first research question on the effect of segregation for Blacks, I focus on the models for Black respondents. I only briefly examine the models for White respondents to address my second research question on the racial gap in health care.

The dependent variable, *health care coverage*, is a binary indicator for whether or not the respondent has any kind of health care coverage or insurance. The questionnaire item is specifically worded as, "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?" I coded this variable as a dummy variable (1=yes, 0=no). The original questionnaire included the response options of "don't know/not sure" and "refused," but cases in these categories were treated as missing data and dropped from the sample. These options were only 0.23% of all respondents; therefore their exclusion is not likely to have a meaningful impact on the final analysis.

Population variables as well as a segregation index were downloaded from the Lewis Mumford Center, which provides these measures calculated from the 2000 United States Census (Lewis Mumford Center 2002). The segregation index is the main substantive independent variable in the analyses. Segregation is conceptualized as having five dimensions: evenness, exposure, concentration, centralization, and clustering (Massey and Denton 1988; Massey and Denton 1989). The most commonly used of these is evenness, and the most commonly used measure of evenness is the index of dissimilarity, which numerous other studies on segregation and health have used (Ellen,

Cutler, and Dickens 2000; Farley 2005; Farley 2007; Hart et al. 1998; Polednak 1991). However, more recent studies suggest that the exposure indices, such as the Black isolation index, are better measures to capture the social isolation from segregation and the health effects it could produce[1] (Collins and Williams 1999; Subramanian et al. 2005). The indicator of residential segregation, *Black isolation*, measures the extent to which a Black resident of a metropolitan statistical area is likely to be in contact with another Black resident based on residence. The more likely a Black resident of an MSA is to be in contact with other Black residents indicates higher levels of racial segregation and group isolation. Therefore, the index measures the extent to which Blacks as a group are isolated from the rest of the population. For the purpose of this study, I used the calculations of the Black isolation index for each MSA as published by the Lewis Mumford Center (2002). The Black isolation index was calculated using the following formula:

$$P *= 100 * \sum \left(\frac{B_i}{B}\right)\left(\frac{B_i}{T_i}\right)$$

where B is the metropolitan Black population, B_i is the Black population of tract i, and T_i is the total population of tract i (Lewis Mumford Center 2002). Black isolation ranges from 0 to 100, with a higher score indicating higher amounts of Black isolation, or more racial residential segregation. This particular measure of segregation only examines Black segregation as African Americans are the main non-White racial minority whose

[1] I also ran all of the statistical models using the index of dissimilarity, the more common measure of segregation, to check that the results would not be dramatically altered by the choice of measure. These results were quite comparable with the results from the models using the Black isolation index, as it produced significant and negative results for Black respondents, with the Black isolation index producing somewhat stronger effects. Conversely, for White respondents, the index of dissimilarity produced similarly weak effects. Therefore, the index of dissimilarity does not produce substantially different effects. I chose to use the Black isolation index as I found it to be conceptually more relevant to study the effects of concentrated poverty from group geographic isolation.

health disparities I am interested in studying with this research. Additionally, other groups have had different trajectories in the United States and many have not been subject to residential segregation in the manner that Blacks have.

In the models for White respondents, I include the same measure of Black isolation in order to test my second research question on the racial gap in health insurance. I include this measure to determine if the level of Black isolation has any negative consequences for the White respondents of those cities. I am including this variable in the White model in order to examine the influence of residential segregation on the Black-White gap in health care coverage; however, I do not expect a substantial result from this measure. Black isolation would not theoretically be an indicator of potentially negative neighborhood-level effects as Whites propagated segregation as a means to maintain social distance from other racial groups in the same city.

A limitation of this data is that the segregation measure is calculated at the metropolitan level. In order to examine segregation, it would be ideal to use the smallest possible geographic unit, preferably one representing a neighborhood. A few studies examining segregation have used census tracts as a proxy for neighborhoods. In this data, the segregation score for each metropolitan area was calculated by summing the proportion of Black residents at each census tract multiplied by the total proportion of Black residents in the metropolitan area, so the measures used here do take into account the neighborhood-level effects to determine the extent to which each metropolitan area is segregated. Given that a geographic identifier at the census tract level was not available in the BRFSS data, I chose to use segregation data at the metropolitan level and a multilevel method to provide contextual variables. The segregation score at the

metropolitan-level was calculated using neighborhood data, and cities provide a useful unit for analysis. The characteristics of a city are important for how residents of that city experience the social world. Furthermore, although the neighborhood is where one can more readily observe the effects of segregation, the extent to which one's city is segregated is a better determinant of the likelihood that an individual Black resident will live in a segregated neighborhood. Therefore, for the research question at hand, the metropolitan-area approach is fitting.

Also, by dividing the data set into the Black sample and the White sample, it removes the notion that segregation would have the same effect on both Black and White respondents in a single metropolitan area. Using this method, it does assume however that the effect of how segregated a city may be is equivalent for all members of that racial group. Residents of a city may or may not experience racial residential segregation in very different ways, yet these models assume a similar experience. Although this assumption is present, I am also using a multilevel statistical approach, which includes data at two levels. An individual's experience may differ, but the models are examining how the contextual conditions of a given city can affect an individual-level outcome. In this case, I am examining how the level of segregation of a city can affect an individual's access to health insurance compared to residents of other cities with differing levels of segregation. Additionally, the majority of the previous work on the impact of segregation on health has used either city-level or county-level measurements, with the exception of a few single-city studies.

The BRFSS provides several demographic variables which were used as level 1 control variables in the multilevel models. I included the variables for *age*, *gender*,

education, *income*, *marital status*, and *employment status*. Age (in years) and education (highest level of schooling completed) were treated as continuous variables. Gender (1=female, 0=male), and marital status (1=married, 0=else) were coded as a dummy variables. A variable for employment status was recoded into a set of four dummy variables. The original data included eight response options: employed for wages, self-employed, out of work for more than one year, out of work for less than one year, homemaker, student, retired, and unable to work. The first option was coded into a dummy variable for *employed for wages* (1=employed, 0=else), the second into a dummy variable for *self-employed* (1=self-employed, 0=else), and the third and fourth options for being out of work for any length of time were coded into a dummy variable for *unemployed* (1=unemployed, 0=else). The remaining options were coded into a dummy variable for "*other employed*" as all the remaining options represent people outside of the workforce for a variety of reasons other than unemployment (1=other employed, 0=else). The dummy variable for employed for wages was used as the reference group. For income, I used a calculated variable from the data set which groups income into five categories: less than $15,000, $15,000 to less than $25,000, $25,000 to less than $35,000, $35,000 to less than $50,000, and $50,000 or more. As a large number of respondents (12.95%) have a missing value for this variable, I recoded income into a group of dummy variables including all five of the response options and a sixth option of "don't know/refused." For this variable, the "less than $15,000" response option was used as the reference group. Furthermore, I included a health-related control variable from the BRFSS data set. The item asks the respondent about his or her *general health status* with five response options ranging from excellent to poor and was treated as continuous. Two

additional response options of “don’t know/not sure” and “refused” were available in the original questionnaire. The cases in these categories accounted for only 0.25% of respondents and were dropped from the sample. Finally, I included a variable for where the individual lives within the MSA. The variable was recoded into a dummy variable to represent those who live in the urban *city center* of the MSA (1=inside city center, 0=else).

All level 1 independent variables were group-mean centered, which centers the variables around the MSA-specific group means, as opposed to the means for the entire sample (Raudenbush and Bryk 2002). This is useful because it removes all of the between cluster variation from the level 1 variables and makes the level 1 variables statistically unrelated to the level 2 variables (Raudenbush and Bryk 2002). Additionally, the effects of the level 1 variables are now only relative to the particular cluster rather than to entire sample (Raudenbush and Bryk 2002).

For MSA-level variables, I compiled MSA-level data from various sources, including the 2000 U.S. Census, the Lewis Mumford Center, the U.S. Department of Commerce, and American Factfinder. As controls, I included variables for *population* of the MSA and *median income per capita* at the MSA-level, which were both treated as continuous. Both of these variables were logged to account for skew. Additionally, I included a variable for *population density*, which reflects the population per square mile of land area of the MSA. Both of these measures were treated as continuous.

Furthermore, to test the three hypotheses based on my first research question, I included a variety of variables. For my first hypothesis, on the impact of educational inequalities, I included two variables. The first is a variable for the percentage of people

in the MSA with a *bachelor's degree* to measure the positive impacts of higher education, and the second is a variable for the percentage of people in the MSA who *dropped out of high school* and did not complete a high school education to measure the negative impacts of educational breakdown. Second, in order to test my second hypothesis examining the potential impact of social breakdown, I included two family measures. The first measure is the percentage of households in the MSA who are *married couples*, regardless of whether or not they have children. The second variable is the percentage of households that are single-parent, *female-headed households*. Third, to examine the impacts of economic opportunity for my third hypothesis, I included five measures to understand the impacts of poverty and the quality of occupations available. First, I included a measure for the percentage of the population of the MSA living below the poverty line, *percent poverty*, to control for the impact of not just income, but poverty specifically. I also included the *unemployment rate* for each MSA, to understand how joblessness may affect access to health insurance. Second, I included two industry and occupational variables, *percent manger/professional jobs* and *percent manufacturing industries* in the MSA, as occupations and industries which may be more likely to include benefits such as health insurance. Finally, I included a measure for the percentage of workers in the MSA who are members of a union, or *union density*, given that union jobs typically include health benefits. All of these measures were treated as continuous, and all level 2 variables were left uncentered.

Methods

In order to address my two research questions and test the three hypotheses related to the first research question, I estimated six multilevel binary logistic regression models for both Black and White respondents. As the data is measured at both the individual-level and the metropolitan area-level and the focus of this study is the metropolitan-area effects, a multilevel method is most appropriate in order to account for the hierarchical nature of the data. Furthermore, prior to the multilevel models with variables at level 1 and 2 included, I ran a fully unconditional model for both the Black and White samples. From these models I conducted a likelihood-ratio test to test the significance of the error variance across level 2. The variance was statistically significant for this data, justifying the use of a multilevel model.[2]

I estimated six models for Black respondents building on the research questions and hypotheses stated above. In order to test my first research question, whether or not segregation has an effect on access to health insurance for Blacks, I estimated a model, Model 1, with only the variable for Black isolation included. Model 2 includes Black isolation and three level 2 control variables, log median income, log population, and population density. Furthermore, to test the three hypotheses related to my first research question examining the ways in which segregation may affect health insurance access, I included different combinations of level 2 variables. Model 3, testing the educational hypothesis, includes the variables for percent bachelor's degree and percent high school dropout. Model 4, testing the social hypothesis, includes the variables for percent

[2] Additionally, using these models, I calculated a pseudo intra-class correlation coefficient (ICC) for binary outcomes to examine the amount of variability at level 2, the MSA level. The Black model has an ICC of .0394, indicating that 3.94% of the variability in health care coverage for Blacks is between MSAs. The White model has an ICC of 0.0299, indicating that 2.99% of the variability in health care coverage for Whites is between MSAs.

married households and percent female-headed households. Model 5, testing the economic opportunity hypothesis, includes the variables for percent poverty, the unemployment rate, percent manager/professional occupations, percent manufacturing occupations, and union density. Model 6 includes all of the aforementioned variables, with the exception of percent bachelor's degree because of problems of multicollinearity when all were included. All of these models include the individual-level variables, Black isolation and the three controls, log median income, log population, and population density. To address my second research question, I duplicated all of these models using the sample of White respondents, focusing on the final, full model.

CHAPTER IV

RESULTS

Before analyzing the impact of segregation, the descriptive statistics first provided some interesting comparisons. The descriptive statistics for all variables divided between the Black and White models can be found in Table 1. On average, Blacks are less likely to have health care coverage from any source (86%) compared to Whites (93%) before accounting for the impact of place and segregation. This difference is statistically significant ($p<.001$). When race was included in a binary logistic regression model of health insurance (not shown in the tables), being Black, compared to White, decreased the odds of having health insurance by 58%. Black respondents are also more likely to be in poor health (2.79 compared to 2.42 for Whites). Blacks are twice as likely to be unemployed compared to Whites (8% vs. 4%). Blacks in this sample are also much less likely to be married compared to Whites (32% vs. 58%). Additionally, they are more likely to live in an urban setting, are overrepresented in the lower income groups, and are

underrepresented in the higher income groups. Even before examining the multilevel regression results and situating the data within the context of metropolitan variables, we can see from the descriptive statistics that Blacks are in a disadvantaged social position compared to Whites.

The level 2 results for Black respondents from all six multilevel binary logistic regression models can be found in Table 2.[3] As the results from Black respondents are the main focus of this analysis, the results from the White models can be found in Appendix A. The level 2 variables are the focus of this analysis. The level 1 results for both the Black and White samples are found in Appendix B.

First, to address my first research question, if residential segregation hinders access to health insurance for the Black population, Model 1 in Table 2 includes only the variable for Black isolation at the MSA-level. The effect of Black isolation was negative and significant, indicating that as Black isolation in a metropolitan area increases, Black residents are less likely to have health care coverage. Substantively, every one standard deviation increase in Black isolation decreases the average odds of having health insurance by 15.5%.[4] This result confirms my first hypothesis, demonstrating that residential segregation negatively impacts access to health insurance for Black residents.

[3] Recent research indicates that it can be problematic in logistic regression models to compare coefficients and odds ratios across models with different variables due to bias from the unobserved hetereogeneity (Mood 2010). To combat this problem, I calculated the y-standardized logit coefficient for Black isolation for all six models in order to compare these coefficients between models. To y-standardize each coefficient, I first calculated the standard deviation of the latent y for each model, and then divided the logit coefficient by this value. The standard deviations for each latent y were virtually the same, indicating that for this data, unobserved heterogeneity may not be problematic. The y-standardized coefficients for Black isolation for each model are as follows: Model 1=-0.003, Model 2=-0.005, Model 3=-0.005, Model 4=-0.005, Model 5=-0.004, and Model 6=-0.007. The differences between these y-standardized coefficients are similar to the difference in the coefficients reported in Table 2.

[4] For all interpretations of odds ratios, the remaining variables and random effects are held constant.

TABLE 1

Descriptive Statistics for Variables Used in Multilevel Binary Logistic Regression Models of Health Insurance

Variable Name	Black Models Mean	Black Models SD	White Models Mean	White Models SD	Range	Description
Dependent Variable:						
Health Insurance	0.86	0.35	0.93	0.25	0 to 1	1=insured, 0=not insured
Independent Variables:						
Level 1:						
Age	51.26	16.47	55.63	16.41	18 to 99	Age in years
Female	0.69	0.46	0.62	0.49	0 to 1	1=female, 0=male
Education	13.67	3.12	14.84	2.98	0 to 18	0=no school, 5=elementary, 10=some high school, 12=high school, 14=some college, 18=college graduate
Married	0.32	0.46	0.58	0.49	0 to 1	1=married, 0=else
Employment Status						
Employed (reference)	0.47	0.50	0.46	0.50	0 to 1	1=employed for wages, 0=else
Self-employed	0.05	0.21	0.09	0.28	0 to 1	1=self-employed, 0=else
Unemployed	0.08	0.27	0.04	0.19	0 to 1	1=unemployed/out of work, 0=else
Other	0.40	0.49	0.41	0.49	0 to 1	1=homemaker/student/retired/unable to work, 0=else
Income						
< $15,000 (reference)	0.17	0.37	0.06	0.24	0 to 1	1=less than $15,000, 0=else
$15,000 to $25,000	0.20	0.40	0.11	0.32	0 to 1	1=$15,000 to $25,000, 0=else
$25,000 to $35,000	0.13	0.33	0.09	0.29	0 to 1	1=$25,000 to $35,000, 0=else
$35,000 to $50,000	0.13	0.34	0.13	0.34	0 to 1	1=$35,000 to $50,000, 0=else
$50,000 or More	0.26	0.44	0.48	0.50	0 to 1	1=$50,000 or more, 0=else
Don't Know/Refused	0.12	0.32	0.12	0.32	0 to 1	1=don't know/refused, 0=else
General Health Status	2.79	1.11	2.42	1.07	1 to 5	1=excellent, 2=very good, 3=good, 4=fair, 5=poor
City Center	0.67	0.47	0.41	0.49	0 to 1	1=live in city center, 0=else

Variable Name	Mean	SD	Range	Description
Level 2:				
Black Isolation	31.88	22.86	0.64 to 79.02	0=no isolation, 100=complete isolation (LMC)
Log Median Income	10.39	0.18	9.79 to 11.01	Log of median household income in dollars (USDC)
Log Population	14.39	1.05	11.11 to 16.07	Log of population size in number of people (LMC)
Population Density	532.62	789.74	12.5 to 8158.7	Population per square mile of land area of MSA (AF)
Percent Bachelor's Degree	16.86	3.92	7.18 to 31.17	Percent with a bachelor's degree in MSA (AF)
High School Dropout	9.62	2.83	4.16 to 18.25	Percent of high school dropouts in MSA (AF)
Percent Married	51.28	3.82	39.8 to 69.8	Percent of married couple households in MSA (AF)
Percent Female-Headed	12.19	2.32	7.7 to 18.9	Percent of female-headed households in MSA (AF)
Percent in Poverty	11.46	3.42	5.6 to 25.4	Percent of population in poverty of MSA (AF)
Unemployment Rate	3.87	2.61	1.6 to 29.9	Unemployment rate of MSA (CCE)
Percent Professional	34.18	4.93	22.2 to 50.2	Percent manager/ professional occupations in MSA (DD)
Percent Manufacturing	12.67	5.69	2 to 39.4	Percent manufacturing occupations in MSA (AF)
Union Density	11.62	6.29	0 to 31.1	Percent union membership in MSA (US)

Note: Black Model: Level 1 N=20,286 and Level 2 N=139. White Model: Level 1 N=163,100 and Level 2 N=139.
Level 1 data come from the 2008 Behavioral Risk Factor Surveillance System.
Level 2 data come from the 2000 United States Census, the Lewis Mumford Center (LMC), the United States Department of Commerce (USDC), American Factfinder (AF), Diversity Data (DD), City and County Extra (CCE), and Union Stats (US). The source of each level 2 variable is indicated in parentheses in the variable description.

TABLE 2

Coefficients (Standard Errors), X-Standardized Odds Ratios, and Discrete Change Coefficients for Level 2 Variables from Multilevel Binary Logistic Regression Models of Health Insurance for Black Respondents

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		
Variable Name	β	OR	β	OR	β	OR	β	OR	β	OR	β	OR	DC
Fixed Effects:													
Level 2 Variables:													
Black Isolation	-0.007**	0.845	-0.010***	0.797	-0.010***	0.787	-0.010**	0.798	-0.009***	0.815	-0.014***	0.726	-0.032
	(0.003)		(0.003)		(0.003)		(0.004)		(0.002)		(0.003)		
Log Median Income			0.058	1.010	-0.104	0.982	0.023	1.004	-1.334**	0.789	-1.486***	0.768	-0.026
			(0.351)		(0.413)		(0.386)		(0.461)		(0.452)		
Log Population			0.133	1.149	0.169**	1.195	0.134*	1.151	0.094	1.104	0.105	1.117	0.011
			(0.064)		(0.063)		(0.064)		(0.057)		(0.058)		
Population Density			0.058[a]	1.047	0.041[a]	0.033	0.051[a]	1.041	0.072[a]	1.059	0.057[a]	1.046	0.004
			(0.056)[a]		(0.055)[a]		(0.064)[a]		(0.058)[a]		(0.055)[a]		
Percent Bachelor's Degree					-0.006	0.978							
					(0.018)								
High School Dropout					-0.050**	0.868					0.006	1.018	0.002
					(0.019)						(0.021)		
Percent Married							-0.012	0.954			-0.014	0.948	0.005
							(0.018)				(0.019)		
Percent Female-Headed							-0.010	0.977			0.074*	1.188	0.017
							(0.035)				(0.036)		
Percent in Poverty									-0.042	0.865	-0.082**	0.756	-0.028
									(0.022)		(0.028)		
Unemployment Rate									0.054	1.151	0.054	1.153	0.014
									(0.055)		(0.054)		
Percent Professional									0.054***	1.308	0.058***	1.330	0.028
									(0.014)		(0.016)		
Percent Manufacturing									0.009	1.054	0.013	1.078	0.007
									(0.009)		(0.009)		
Union Density									0.020*	1.131	0.019*	1.121	0.012
									(0.009)		(0.010)		
Constant	2.397***		0.036		1.820		1.123		12.956**		14.559**		
	(0.128)		(3.295)		(3.875)		(4.107)		(4.531)		(4.568)		

Random Effects:

Intercept Variance	0.178	0.144	0.126	0.143	0.084	0.069
Deviance	14246.832	14235.058	14228.062	14234.608	14213.626	14208.862
AIC	14280.830	14275.060	14272.060	14278.610	14263.630	14264.860
BIC	14415.430	14433.410	14446.250	14452.800	14461.630	14486.560
Level 2 R^2	0.091	0.264	0.357	0.271	0.572	0.650

Note: Level 1 N=20,286 and Level 2 N=139.
β=Coefficient. OR=X-standardized odds ratio (factor change). DC=Discrete change coefficient.
For each discrete change coefficient, the remaining variables are held at their means. The discrete change coefficients reflect a change in the predicted probability associated with a standard deviation increase, centered around its mean.
a. These coefficients and standard errors have been multiplied by 1,000 for ease of presentation.
*p<.05, **p<.01, ***p<.001 (two-tailed).

Model 2 adds three level 2 control variables, log median household income, log population, and population density. None of these variables in Model 2 rendered statistically significant results nor did they account for the effect of residential segregation, as the effect of the variable for segregation remains strong.

The next three models test the three hypotheses developed for my first research question, attempting to explain by what processes residential segregation can affect access to health insurance. First, Model 3, testing Hypothesis 2 on educational inequality, included two educational variables measured at the MSA-level to examine the impact of education on access to health insurance and whether or not education can account for the substantial effects of residential segregation on health insurance. The variable for percent bachelor's degree, exemplifying the potentially positive effect of education on access to health insurance, was not significant. On the other hand, the variable for the percent of high school dropouts, indicating the negative effects of lack of educational attainment, was significant. To interpret this result, every one standard deviation increase in the percentage of high school dropouts in the MSA leads to a 13.2% decrease in the average odds of having health insurance. Thus, education in the positive direction, at least as measured by having a bachelor's degree, did not produce substantial effects, and the negative impacts of (a lack of) education, as measured by the percent of high school dropouts, did produce substantial effects. However, although percent of high school dropouts was a factor affecting access to health insurance, it did not diminish the effect of residential segregation, which remained substantial in the educational model.

In Model 4, as test of Hypothesis 3, which examines social factors, neither the variables for percent married couple households nor percent female-headed households

were significant factors in explaining access to health insurance. Furthermore, the effect of residential segregation remained substantial in this model, indicating that social factors could not account for the effect of segregation on access to health insurance.

Model 5, which serves as test of Hypothesis 4 on economic opportunity, produced noteworthy results. First, examining the impacts of poverty, although percent in poverty was not significant, log of median income became negative and significant in this model, indicating that when including other economic factors, income at the MSA-level was actually a negative factor in predicting access to health insurance for Black respondents. Second, although the impact of employment status at level 1 was substantial (see Appendix B), the effect of the unemployment rate at the MSA-level produced no effect. Next, turning to the industry and occupational factors, while the variable for percent manufacturing was not significant, percent manager/professional jobs was. I hypothesized that both of these types of employment would be more likely to provide health benefits, however only the results for percent manager/professional occupations were significant. More specifically, every one standard deviation increase in the percentage of manager/professional occupations at the MSA-level leads to a 30.8% increase in the average odds of having health insurance. Additionally, increasing union density was also significantly related to an increase in the average odds of having health insurance, which is an expected result as union jobs are more likely to offer benefits such as health care coverage. Every one standard deviation increase in union density leads to a 16.9% increase in the average odds of having health insurance.

However, as in the previous two models, these variables did not remove the effect of residential segregation on the outcome. Of note, the variables in Model 5 are the only

group of variables that causes the coefficient for Black isolation to decrease, albeit only slightly. Compared to Model 2 with only Black isolation and the level 2 control variables, Model 5 brings the coefficient down from -0.01 to -0.009, which represents a 10% decrease in the coefficient. Models 3 and 4 produce the same coefficient for Black isolation as Model 2 and therefore do not mitigate the effects of residential segregation. Furthermore, examining the model fit statistics for Models 2 through 5, Model 5 has the lowest value for the AIC, and by far the highest value for the level 2 adjusted-R^2 (0.572). The next highest adjusted-R^2 value is for Model 3 (0.357), indicating that Model 5 explains an additional 21.5% of the variance at level 2. Thus, although Model 5 could not account for the effects of residential segregation, it produced the most substantively interesting results and does the best job of explaining access to health insurance.

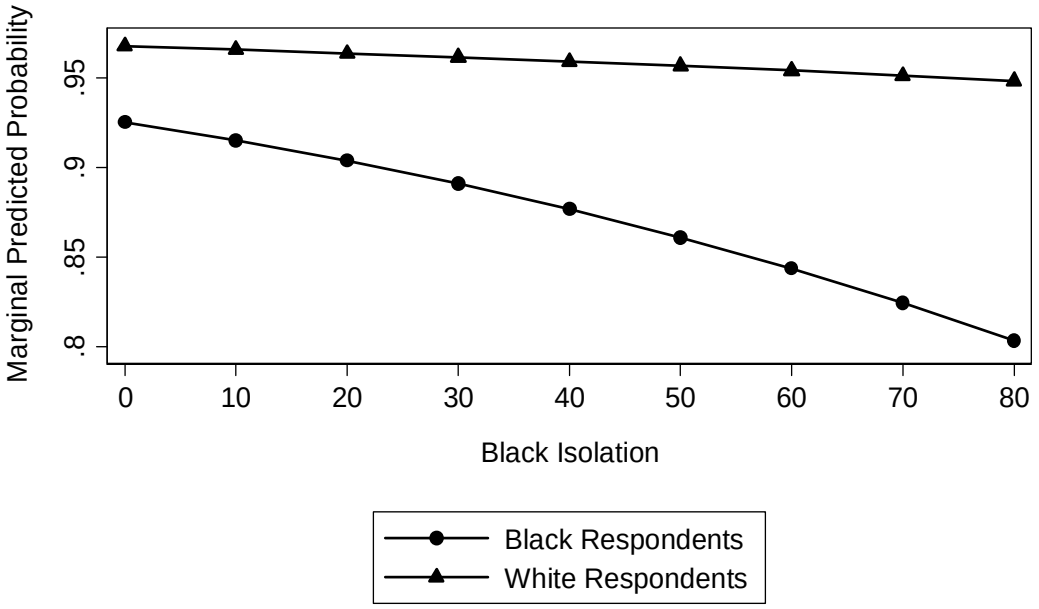
When all of these variables (excluding percent bachelor's degree) were included in Model 6, the full model, some interesting and in some cases counterintuitive results were produced. The variable for percent of female-headed households was significant and positive. The results are interesting for two main reasons. First, based on the previous literature, I would expect percent female-headed households to have a negative effect as a social factor indicative of high levels of poverty. Second, this measure in the more limited previous model did not produce significant effects. Therefore, it is the combination of this variable with others that causes it to produce a significant effect when in the previous model it did not. Because the outcome variable specifies health insurance from any source, including social assistance, it is possible that this effect is the result of increased access to social assistance for single mothers. Second, the variable for percent of high school dropouts, which produced a significant effect in the previous, more limited

model is no longer significant. Percent in poverty of the MSA also became negatively significant in this final model, or substantively, every one standard deviation increase in the percentage of the MSA population in poverty decreases the average odds of having health insurance by 24.4%. These results further demonstrate that the variables for economic opportunity, or Hypothesis 4, do the best job of explaining access to health insurance. However, once again, even with all of these variables included in one model, the effect of residential segregation remains unchanged. In fact, Model 6 demonstrates the strongest effect of Black isolation. Black isolation in the final model decreases the average odds of having health insurance by 27.4%, which is one of the strongest effects in the model. Therefore, while these results affirm the first research question, that residential segregation has a negative effect on the ability of Black residents of segregated cities to access health insurance, they fail to explain the pathways by which segregation can affect access as developed by my three hypotheses.

To further examine the relationship between Black isolation and access to health insurance, the final column in Table 2 provides the discrete change coefficients for each level 2 variable in Model 6, which provides a better measure of the substantive impact of each variable. A mean-centered one standard deviation increase in Black isolation is predicted to increase the probability of having health insurance by 0.032, which is the largest substantive effect at the MSA level. Furthermore, for Model 6, I calculated the predicted probability of having health care coverage for every ten unit increase in Black isolation. The observed range of Black isolation for the cities in this sample ranges from approximately zero to 80, so I calculated the predicted probability for every ten unit

increase from zero to 80 for the Black and White samples.[5] Those results are presented graphically in Figure 1. Figure 1 visually demonstrates that as Black isolation increases in a metropolitan area, the predicted probability of having health insurance decreases for Blacks. The total change in the predicted probability of having health care coverage from the lowest observed value of Black isolation to the highest observed value is a decrease of 0.122 (from p=0.925 to p=0.803). These results further indicate that the effect of Black isolation on access to health care coverage is substantial.

Figure 1
The Effect of Black Isolation on the Predicted Probability of Having Health Insurance



Finally, to address my second research question and my fifth hypothesis, whether residential segregation contributes to the Black-White gap in health care, I examine the

[5] All of the predicted probabilities were calculated using marginal probabilities. For each predicted probability, the remaining variables are held at their means.

results from Figure 1 and Appendix A. First, as a point of comparison, I included a line in Figure 1 for the predicted probability of having health care coverage for every ten unit increase in Black isolation for White respondents for Model 6. Compared to the graph of the line for Black respondents, which has an obvious negative slope, the line for White respondents, while also negative, is relatively flat (from p=0.968 to 0.948). The figure demonstrates two main points regarding my second research question. First, even with a Black isolation score of 0, White respondents are more likely than Black respondents to have health insurance, as the line for Black respondents starts at a lower point than the line for White respondents. Second, the Black-White gap in health insurance grows as Black isolation increases. Although the line for White respondents decreases slightly as Black isolation increases, the gap between the two lines increases dramatically as Black isolation increases. The Black-White health coverage gap is 0.042 (p=0.968 for Whites and p=0.925 for Blacks) at the lowest level of segregation, 0.076 (p=0.960 for Whites and p=0.885 for Blacks) at the median value for segregation, and 0.145 (p=0.948 for Whites and p=0.803 for Blacks) at the highest level of segregation. This demonstrates that Black isolation, while demonstrating almost no effect for White respondents, contributes greatly to the gap in health care coverage between Whites and Blacks in the United States.

To briefly address the results from the models in Appendix A, for the models including the sample of White respondents, the variable for Black isolation produced mixed effects, depending on which MSA-level variables were included. When the variable for Black isolation alone was included at level 2, the effect of Black isolation was not significant and had no substantial effect with an odds ratio of exactly 1.

Additionally, it was not significant in Model 2 with the level 2 controls or Model 5 with economic indicator variables. However, in Model 3, with education variables, Model 4 with social variables, and Model 6, the full model, the effect of Black isolation was significant and negative. I did not expect a noteworthy effect from this variable in the model of White respondents, as there is no literature showing that Black isolation would have deleterious effects on health or health care access for Whites. As such, Black isolation alone had virtually no effect in the model of White respondents, indicating that for Whites, the social isolation of Blacks has no substantial effect on their ability to access health insurance, and is not one of the variables impacting this outcome. Black isolation was significant in the education model, the social model, and the final model, but only when including certain variables, which potentially suggests that when accounting for the effects of education and social factors at the MSA-level, Black isolation has a negative effect for White respondents. In contrast, the effect of Black isolation for Black respondents was statistically significant in every model, produced substantively important effects, and the other variables at level 2 did not mitigate this effect.

CHAPTER V

DISCUSSION AND CONCLUSIONS

There are several main ways that people access health care coverage, principally through their employment, through a family member, or through social assistance for those that qualify. Health insurance is a fundamental component of health care access in the United States, especially for advanced and specialty care, which is usually unavailable through alternative forms of access such as free clinics, and too expensive to pay out of pocket. I hypothesized, drawing on Massey and colleagues' geographic concentration of poverty theory of segregation, that racial residential segregation could impact the ability of Black residents of segregated cities to access adequate health care coverage (Krivo et al. 1998; Massey 1990; Massey and Denton 1993; Massey, Gross and Shibuya 1994; Massey and Fischer 2000). As segregation compounds poverty and social problems into one geographical area, these socioeconomic effects which could impact one's access to health insurance, could lead to reduced access to health insurance. From the results, I found a

substantial impact of Black isolation for Black residents of 139 U.S. metropolitan areas on the likelihood of having health care coverage. This effect was significant even when controlling for more obvious socioeconomic factors such as education, employment, and income at both the individual-level and the city-level. As Black residential segregation increased, Black residents of those cities were less likely, compared to Black residents of cities with lower levels of segregation, to have health care coverage of any type. This result addresses my first question, confirms my hypothesis, and confirms Massey and colleagues' theory which informs this study.

Related to my first research question, I also specified three hypotheses on the mechanisms by which segregation could impact access to health insurance. Using the effects of geographic concentration of poverty from Massey and colleagues' theory that I reasoned would be pertinent to the outcome of health care coverage, I included the effects of educational opportunities, social breakdown, and economic opportunity in models predicting health care coverage (Krivo et al. 1998; Massey 1990; Massey and Denton 1993; Massey, Gross and Shibuya 1994; Massey and Fischer 2000). However, when I tested these various negative impacts that segregation could have on access to health care at the metropolitan-area level, none of them substantially decreased the effect of Black isolation. Although a few of these measures were important indicators of either increased or decreased access to health insurance, none were able to account for the effect of residential segregation.

First, the educational factors that indicate the lack of educational achievement, by examining high school dropout rates, at the MSA-level did contribute to reduced access to health insurance. However, a high degree of achievement, a bachelor's degree, was not

related to increased access to health insurance. Perhaps a variable for the percent of people in an MSA who have a bachelor's degree (versus more inclusive educational measures which would include associates degrees or vocational training programs) is not the best indicator of upward mobility and access to higher quality jobs that might provide benefits.

Second, social and family indicators did not have a significant effect on health care access. This facet of the negative consequences of segregation as a form of structural racism is emphasized in Massey and Denton's work (1993), as well as elsewhere in the literature, but does not appear to have a substantial effect. In the final, full model, percent of female-headed households was actually significantly positively related to health care coverage access. As this outcome specifies health care coverage of any type, including social assistance, this effect may be significant as single mothers are often able to get coverage for their children and themselves through social assistance. Conversely, being married, as measured at the individual level, had a substantial positive effect on health insurance. Thus, these factors, as a structural, city-level effect were not important for understanding disparate access to health insurance and certainly did not diminish the effect of residential segregation.

Finally, the economic opportunity factors provided the best understanding of the outcome, but could still not completely account for the effect of segregation. An increased presence of professional or White collar jobs and an increase in union membership (and therefore possibly the presence of union jobs in an MSA) demonstrated an increased access to health care coverage. However, the effect of residential segregation remained strong in both of the models in which these measures were

included. It is obvious, using both the measures at the individual-level and the metropolitan-level that socioeconomic factors play a role in obtaining health care coverage, but these results demonstrate that segregation itself has a substantial effect on the outcome.

In sum, the results presented here do not account for the causal mechanisms by which residential segregation can affect access to health care coverage. I hypothesized, based on the geographic concentration of poverty theory, that segregation could affect health care access by limiting educational opportunities, increasing the prevalence of family breakdown and social disorder, and limiting economic and occupational opportunities. However, none of these variables or even the combination of these variables could account for the effect of racial residential segregation. Although I included many measures for each of these different hypothesized effects, perhaps more variables or even a different operationalization of such variables could better account for the effect of segregation. Additionally, although the previous theory and research highlights these facets of segregation, perhaps racial residential segregation itself, as a form of institutionalized, structural racism, produces these effects and does not rely solely on the pathway of the three mechanisms hypothesized and tested here. These findings provide a framework for future research on the issue, which could assess more specifically how racial residential segregation can affect health care access in a variety of ways.

Furthermore, when assessing my second research question, whether or not segregation contributes to the Black-White gap in health insurance, the results are quite noteworthy. While residential segregation demonstrates a strong decrease in the

likelihood of having health care coverage for Black respondents, there is no such effect for White respondents. While segregation for White respondents does actually slightly decrease their likelihood of having health insurance, the effect for White respondents was not substantial. Even without taking into account the effect of segregation, Blacks are less likely to have health insurance, but residential segregation further increases this gap, as evidenced in Figure 1. These results affirm my expectations based on Massey and colleagues' theory. They argue that members of the dominant group not subject to segregation are spatially buffered from the negative effects of concentrated poverty resulting from segregation, which is what these results demonstrate.

Thus, these results present some evidence for applying Massey and colleagues' concentration of poverty theory to the outcome of health care access. The results affirm the first implication of their theory, that segregation concentrates poverty, which produces certain negative social effects, in this case by limiting access to health care coverage. Additionally, the results affirm the second implication of their theory, that by concentrating poverty in one racial group, the White dominant group is buffered from the negative effects of segregation, which was evidenced by showing that segregation contributes to the Black-White gap in health care coverage. While the results conform to these aspects of the theory, the results fail to reveal some of the mechanisms brought forth by the concentration of poverty theory of segregation. The educational and social variables did not mitigate the effect of segregation at all. The economic opportunity variables provided some explanation for the effect of segregation on access to health insurance, but they could not account for the whole of this effect. Further work to understand the mechanisms of poverty concentration in segregated neighborhoods on the

effect of reduced health care access is an important consideration for future research to further build this argument and the evidence for Massey et al.'s theory.

Overall, the findings presented here contribute to our understanding of the Black-White gap in health care outcomes. The findings demonstrate that higher levels of segregation in cities limit access to health care coverage for Black residents. Additionally, while segregation produces this effect for the Black community, White residents of these same areas are shielded from the effects of segregation. This study makes several major contributions to our understanding of these issues. First, while there has recently been a lot of literature demonstrating the effect of segregation on health outcomes, little is known about the impact of segregation on health care. While this study only examines one health care outcome, health insurance, future studies on other facets of health care access and use would be useful to further our understanding of this association. Second, this study uses a large, national sample and a multilevel statistical method, examining both individual and metropolitan-area levels of data. Other studies on the topic have either used a geographically limited area or methods that do not capture the full scope of the effect of segregation. Given these advantages, studies using a variety of methods and samples would be necessary to further our understanding of the impact of segregation on health care outcomes.

Furthermore, these findings could contribute to our understanding of the Black-White health gap in the United States. Lack of access to health care, which has been shown to have detrimental health consequences, could have an intervening effect on health outcomes overall for the U.S. Black population. Previous studies as well as the descriptive statistics within this study have demonstrated that Black Americans in general

are less likely to have health insurance compared to Whites (Hoffman and Paradise 2008). The findings here demonstrate that residential segregation may play an important part in the perpetuation of both health and health care racial inequities. Since enforced segregation was made illegal by the Fair Housing Act of 1968, efforts to combat segregation and its effects for Black Americans have sharply declined. Although no longer legal, de facto segregation remains an important part of the social landscape of the United States. This study, among a growing body of literature on the subject, shows that the negative consequences of our failure to racially integrate as a society continue to produce deleterious effects for the Black community. The findings in this study indicate that in order to effectively address and combat the glaring health and health care inequalities that persist in the United States, residential segregation must be a part of that discussion.

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APPPENDICES

APPENDIX A

Coefficients (Standard Errors), X-Standardized Odds Ratios, and Discrete Change Coefficients for Level 2 Variables from Multilevel Binary Logistic Regression Models of Health Insurance for White Respondents

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		
Variable Name	β	OR	β	OR	β	OR	β	OR	β	OR	β	OR	DC
Fixed Effects:													
Level 2 Variables:													
Black Isolation	-0.011[a]	1.000	-0.003	0.939	-0.003*	0.940	-0.004*	0.913	-0.002	0.959	-0.006***	0.868	-0.005
	(0.002)		(0.002)		(0.001)		(0.002)		(0.001)		(0.002)		
Log Median Income			0.884***	1.174	0.647**	1.124	0.934***	1.185	0.106	1.019	0.133	1.025	0.001
			(0.182)		(0.206)		(0.213)		(0.254)		(0.259)		
Log Population			0.041	1.048	0.082*	1.098	0.043	1.051	0.020	1.023	0.055	1.065	0.002
			(0.035)		(0.033)		(0.035)		(0.031)		(0.031)		
Population Density			0.089*[a]	1.073	0.067[a]	1.055	0.075[a]	1.061	0.069[a]	1.056	0.049[a]	1.040	0.001
			(0.041)[a]		(0.038)[a]		(0.043)[a]		(0.041)[a]		(0.038)[a]		
Percent Bachelor's Degree					0.002	1.006							
					(0.009)								
High School Dropout					-0.050***	0.868					-0.030**	0.917	-0.003
					(0.010)						(0.011)		
Percent Married							-0.003	0.988			-0.003	0.987	-0.000
							(0.009)				(0.009)		
Percent Female-Headed							0.015	1.035			0.065**	1.164	0.006
							(0.021)				(0.022)		
Percent in Poverty									-0.012	0.961	-0.034*	0.890	-0.004
									(0.012)		(0.015)		
Unemployment Rate									0.017	1.045	0.023	1.062	0.002
									(0.013)		(0.013)		
Percent Professional									0.039***	1.211	0.031***	1.168	0.006
									(0.007)		(0.008)		
Percent Manufacturing									0.007	1.042	0.008	1.049	0.002
									(0.005)		(0.005)		
Union Density									0.016***	1.107	0.007	1.047	0.002
									(0.005)		(0.005)		
Constant	3.208***		-6.420***		-4.064*		-6.938**		0.324		-0.036		
	(0.059)		(1.755)		(1.961)		(2.394)		(2.522)		(2.733)		

Random Effects:

Intercept Variance	0.134	0.084	0.065	0.084	0.060	0.050
Deviance	63000.980	62947.060	62920.680	62946.220	62914.460	62898.280
AIC	63034.970	62987.050	62964.670	62990.220	62964.450	62954.280
BIC	63204.960	63187.040	63184.660	63210.200	63214.440	63234.250
Level 2 R^2	0.000	0.371	0.514	0.376	0.554	0.625

Note: Level 1 N=162,635 and Level 2 N=139.
β=Coefficient. OR=X-standardized odds ratio (factor change). DC=Discrete change coefficient.
For each discrete change coefficient, the remaining variables are held at their means. The discrete change coefficients reflect a change in the predicted probability associated with a standard deviation increase, centered around its mean.
a. These coefficients and standard errors have been multiplied by 1,000 for ease of presentation.
*p<.05, **p<.01, ***p<.001 (two-tailed).

APPENDIX B

Coefficients (Standard Errors) and Odds Ratios for Level 1 Variables from Multilevel Binary Logistic Regression Models of Health Insurance for Black and White Respondents

	Black Respondents				White Respondents			
Variable Name	β	SE	OR	DC	β	SE	OR	DC
Age	0.025***	(0.002)	1.510[a]	0.041[b]	0.044***	(0.001)	2.050[a]	0.027[b]
Female	0.387***	(0.047)	1.472	0.038	0.261***	(0.022)	1.298	0.010
Education	0.030***	(0.008)	1.099[a]	0.009[b]	0.100***	(0.004)	1.349[a]	0.011[b]
Married	0.171**	(0.054)	1.186	0.017	0.381***	(0.024)	1.464	0.014
Employment Status								
Employed (ref.)								
Self-Employed	-1.209***	(0.085)	0.299	-0.122	-1.243***	(0.032)	0.289	-0.049
Unemployed	-0.945***	(0.067)	0.389	-0.094	-1.399***	(0.038)	0.247	-0.056
Other	0.652***	(0.060)	1.919	0.065	0.340***	(0.030)	1.404	0.013
Income								
Less than $15,000 (ref.)								
$15,000 to $25,000	0.155*	(0.063)	1.168	0.015	0.023	(0.038)	1.023	0.001
$25,000 to $35,000	0.668***	(0.078)	1.950	0.066	0.431***	(0.044)	1.538	0.016
$35,000 to $50,000	1.119***	(0.087)	3.063	0.112	0.967***	(0.044)	2.629	0.037
$50,000 or more	1.863***	(0.093)	6.445	0.193	1.923***	(0.044)	6.843	0.080
Don't Know/Refused	0.410***	(0.077)	1.507	0.040	0.711***	(0.044)	2.036	0.027
General Health Status	-0.054*	(0.022)	0.948	-0.005	-0.055***	(0.011)	0.946	-0.002
City Center	0.028	(0.052)	1.028	0.003	0.079**	(0.024)	1.082	0.003

Note: Black Respondents: Level 1 N=20,286 and Level 2 N=139. White Respondents: Level 1 N=162,635 and Level 2 N=139.
β=Coefficient. OR=Odds ratio (factor change). DC=Discrete change coefficient.
For each discrete change coefficient, the remaining variables are held at their means.
a. The odds ratios for these variables reflect an x-standardized factor change.
b. The discrete change coefficients for these variables reflect a change in the predicted probability associated with a standard deviation increase, centered around its mean.
*p<.05, **p<.01, ***p<.001 (two-tailed).

VITA

Kathryn Freeman Anderson

Candidate for the Degree of

Master of Science

Thesis: RACIAL RESIDENTIAL SEGREGATION AND ACCESS TO HEALTH CARE COVERAGE: A MULTILEVEL ANALYSIS

Major Field: Sociology

Biographical:

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Completed the requirements for the Master of Science in Sociology at Oklahoma State University, Stillwater, Oklahoma in May 2011.

Completed the requirements for the Bachelor of Arts in Sociology at the University of Texas at Austin, Austin, Texas in December 2005.

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Graduate Teaching Assistant for the courses: Quantitative Methods in Sociology, Racial and Ethnic Relations, Social Stratification, Gender and the Middle East, and Criminology at Oklahoma State University, Stillwater, Oklahoma from January 2009 to May 2011.

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Title of Study: RACIAL RESIDENTIAL SEGREGATION AND ACCESS TO HEALTH CARE COVERAGE: A MULTILEVEL ANALYSIS

Pages in Study: 67 Candidate for the Degree of Master of Science

Major Field: Sociology

Scope and Method of Study:

A developing body of research has demonstrated the impact of racial residential segregation on a variety of negative health outcomes. Researchers theorize that segregation, as a form of structural racism, can have negative health impacts as it concentrates poverty and social problems into one geographical area of a city. However, little is known about the effect of residential segregation on access to health care. The study uses health data from the 2008 Behavioral Risk Factor Surveillance System in multilevel binary logistic regression models to examine the association between Black/White segregation in 139 metropolitan statistical areas in the United States and one health care access outcome, health care coverage.

Findings and Conclusions:

Overall, the effect of Black isolation is related to a decreased likelihood of having health insurance for Black residents of segregated cities. Additionally, higher levels of Black/White segregation had no effect on White respondents' ability to obtain health insurance, indicating that segregation contributes to the Black-White gap in health care coverage. These effects were substantial even when testing for the effects of educational, social and economic factors at both the individual and the metropolitan area level, and could help explain the persistent Black-White health gap in the United States.

ADVISER'S APPROVAL: Tamara Mix and Andrew Fullerton