

(Un) Just Deserts: Examining the Consequences of Economic, Social, and Environmental
Disinvestment in the Urban South

By

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DEDICATION

To all of the communities in the heart of the Dirty South, much like those in which I grew up,
this dissertation is respectfully dedicated.

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Chapter I

INTRODUCTION

Neighborhoods in urban cities throughout the United States have experienced processes of investment and disinvestment since the 1960s, and the processes of disinvestment have varied (Mallach 2012; Vojnovic et al 2013). Social disinvestment takes shape in the form of declining social organizations (e.g., social clubs, libraries, community centers, churches, schools) declining population, and declining public service (i.e., police). Economic disinvestment, the most conspicuous form, involves vast deindustrialization as well as declines in retail outlets and consumer-dependent businesses. Environmental disinvestment involves decline in mixed-land use as well as upticks in environmentally-destructive or negligent processes (i.e., housing abandonment, decline in street maintenance, landscaping, and trash removal). The consequences have been the center of study for urban and environmental scholars, policymakers, and citizens as neighborhoods continue to decline or undergo urban renewal (Dotson and Perera 2016; Gordon 2013; Mendel 2005; Tighe and Ganning 2015; Vojnovic et al 2013).

One consequence of disinvestment is a decline in urban amenities related to leisure, personal and social services, and healthy food (Falola and Faria 2018; Vojnovic et al 2014). This decline results in the transformation of neighborhoods and city areas into resource deserts, or areas that lack adequate access to a social, economic, or health-related resource. Sociologists and demographers have long been interested in this kind of social inequality (Lobao, Hooks, and Tickamyer 2007). Across cities, researchers have examined urban deserts by focusing on a wide variety of resources, including grocery stores and healthcare providers (Gaskin et al 2012; Morland et al 2002). Patterns of limited access to healthy food and healthcare are reproduced for other resource types as well. In addition to the wealth of scholarship on food and healthcare deserts,

there is limited research on justice deserts (Pruitt and Colgan 2010), green deserts (Sister, Wolch and Wilson 2010), pharmacy deserts (Qato et al 2014), childcare deserts (Malik et al 2018), bank deserts (Kashian, Tao, and Perez-Valdez 2015), and deserts related to housing, transit, and employment (Doussard 2013; Jiao and Dillivan 2013). Scholarship on deserts highlights the spatial component of deserts, where space and geographical location become barriers to accessing resources. As disinvestment and investment vary across cities to differentially impact neighborhoods, desert neighborhoods are scattered throughout urban cities in patterns that reflect broader social inequality.

Disinvestment has systematically segregated U.S. cities both racially and economically and has concentrated marginalized populations (e.g., Black people and/or low-income people) in areas lacking social, economic, and environmental resources, creating the context for further decline (Charles 2003; Rothstein 2017; Woods 2002). As such, deserts emerge in areas with higher proportions of racial/ethnic minorities, low economic appeal, high poverty, and high crime rates. (Duncan et al 2012; Raleigh and Galster 2015; Schuetz, Kolko, and Meltzer 2012; Walker et al 2010). For example, Smiley et al. (2010) examine multiple health-related resources in neighborhoods in three U.S. cities, including supermarkets and recreational facilities, and find that neighborhoods with higher proportions of Black residents tend to have lower densities of each of these resources. Likewise, Zenk et al. (2005) find no relationship between supermarkets and racial composition in low poverty areas, but in high poverty areas, neighborhoods with the highest percent of black residents are further from a supermarket. Exploring the race and class patterns of resource deserts is important because disproportionate access to material resources in segregated neighborhoods exacerbates the existing racial and economic disparities in other realms of social life and reify these social inequalities.

The consequences of living in resource deserts have also been examined, and the most common connection explored is the relationship between this inequality across neighborhoods and health as researchers attempt to understand why certain neighborhoods produce poor health outcomes in its residents (Auchincloss et al 2008; Calling et al 2016; Sharfifi et al 2016; Zenk et al 2006). This research has found that access to resources in neighborhoods is related to cardiovascular disease, obesity, body mass index (BMI), asthma, diabetes, and other chronic conditions (Budzynska et al 2013; Douglas, Archer, and Alexander 2019; Salois 2012). These health consequences have varied according to the type and nature of the resource, as well as the nature of residents' lack of access (i.e., distance, intensity/co-occurrence, quality, quantity). For example, Harris (2019) explores the association between access to healthcare resources and childhood asthma in neighborhoods in St. Louis, Missouri and finds that high asthma "hotspots" are located in neighborhoods that lack physical access to healthcare providers as well as pharmacies.

Although the literature on deserts and resource access in neighborhoods is a growing area that spans across several disciplines, research on this topic examines the causes and consequences of limited or no access to single resources in neighborhoods. I argue that examining how neighborhoods come to be deserts of multiple types of resources concurrently and the impacts of this co-occurring resource scarcity is important for a more nuanced understanding of spatial inequality and its effects on health and well-being. As such, I introduce the concept of *multiply-deserted areas* (MDAs) to account for the compounded, co-occurring resource scarcity as a legacy of wide-scale disinvestment across urban cities.

While a connection between resources in the built environment and health has been somewhat established, less is known about how race and class affect not only the spatial patterning of resources throughout cities and across neighborhoods, but also the relationship between access to

resources and health. Moreover, while cities throughout the rust belt and midwestern U.S. (e.g., Detroit, MI, St. Louis, MO, Gary, IN, Cleveland, OH) have garnered much of the attention of urban scholars studying the causes and consequences of “dying” cities, less is known about the nature and effects of disinvestment and resource scarcity in urban, southern cities. As industrialization and urbanization processes occurred in the southern U.S. at a much later time and at a much faster pace, the processes of deindustrialization and disinvestment, then, might also be unique in southern contexts. Thus, an examination of the consequences of disinvestment on urban life (e.g., person-place relationships) and health in urban spaces is necessary, especially as there still remains a gap in understanding the mechanisms behind the stark regional differences in health and well-being outcomes across the U.S.

RESEARCH QUESTIONS

The purpose of this dissertation is to understand how race and class influence the spatial patterning of resources throughout neighborhoods and the health consequences of these patterns. Focusing on urban cities in the American South, the dissertation examines material resources in the built environment, namely grocery stores, pharmacies, and active greenspace (e.g., parks, walking trails). The dissertation is separated into three separate but related empirical studies. The first study explores the basis of spatial inequality in the form of resource deserts, the second study examines the health consequences of said spatial inequality, and the third takes to task the objective measurements of spatial inequality relative to individual experiences of inequality and its effect on attachment to neighborhoods. Each study offers insight into the inequality-environment-health nexus.

The main research questions are:

- 1) What is the relationship between race, class, and neighborhood-level resource scarcity?

- 2) Does compounded neighborhood-level resource scarcity impact health and how do race and class nuance this relationship?
- 3) What does perceived access look like for residents in objectively-resource scarce neighborhoods, and how do these perceptions of access shape attachment to place?

Each of these research questions and the dissertation as a whole are predicated on two key assumptions that should be acknowledged before describing the background literature and theoretical lens through which I write this dissertation. The first assumption is that the racial and socioeconomic composition of neighborhoods are key driving forces for the large-scale social, economic, and environmental disinvestment resulting in the transformation of once-stable urban communities into resource deserts. This assumption is based on evidence of more conspicuous, institutional cases of racial discrimination such as redlining and discrimination in employment and housing (Mitchell and Franco 2018; Pager and Shepherd 2008; Ray 2014; Rothstein 2017). Research into the socio-historical foundations of the United States establishes that much of the socioeconomic disadvantage that racial minorities face involves patterns of racial discrimination that continue to have social, economic, political, and environmental effects on racial minorities, particularly Black Americans (Alexander 2012; Bell 1992; Wilson 1987). These effects, in turn, have negative implications for health and life outcomes for Black individuals (Williams 2018; Williams, Lawrence, and Davis 2019).

The second key assumption on which this dissertation is predicated is space is equally important when assessing how racial minority status and class shape and maintain inequality (Bullard 1990; Lipsitz 2007; McKittrick and Woods 2007; Wilson 2009). The distribution of people across space by race and class interacts with political, social, economic, and environmental systems to create and sustain health and risk disparities within place. These disparities within place

then impact the meanings and bond that humans attach to place—in some ways that further sustain the disparity.

As the dissertation examines phenomena both across space (Ch. 2 & 3) and within place (Ch.4), it is important to make a clear distinction between space and place before engaging theories of spatial inequality and attachment to place. The key distinction between space and place is that place has *meaning*, but space *does* things (Joseph 2008; Tickamyer 2000). Space is simultaneously the context, cause, and outcome of social processes. Space is socially-produced and thus is active and functions to arrange people and things in ways that imbue meaning to the space (Joseph 2008; Tickamyer 2000). As spaces function in ways that humans can add meaning to them, they become places. Thus, place is a form of space with a more particular locale or setting and with a meaning imbued from the manner in which space has functioned. Humans produce space and then wield it in ways that reflect the control of resources and the distribution of power which inherently imbues meaning (Tickamyer 2000). Hence, the way in which space is organized and how people and resources relate to one another across space are entrenched in “relations of power, structures of inequality, and practices of subordination and domination” (Tickamyer 2000, 806).

Another key factor that helps illuminate the space-place distinction is boundaries. Urban space in particular is patterned by boundaries, both objective (social) and invisible (symbolic) (Lamont and Molnar 2002). Space as examined in this study is characterized by social boundaries, that is, unequal access to and distribution of material/nonmaterial resources and opportunities that are manifestations of objectified social differences. Place is characterized by symbolic boundaries—conceptual distinctions made by actors to categorize people, practices, things, and space (Lamont and Molnar 2002). Place is relative to space; so symbolic boundaries, once widely agreed upon, become social boundaries. These social boundaries emerge as patterns of social exclusion and/or

segregation along race and class lines (Joseph 2008). The resulting inequality across space, or spatial inequality, is both the consequence and cause of other types of inequality. In sum, place is derived from space, and these concepts are cyclical- spaces arrange humans and objects and allow humans to instill meaning. Once these imbued meanings are solidified in societal belief systems, they reproduce and sustain the patterns of inequality across space.

BACKGROUND AND THEORY

I situate this dissertation within three distinct areas of sociological scholarship. Urban sociological literature explores the causes and consequences of urbanization and the growth of cities, the structure of urban areas, and social life and creation of culture in urban space. Drawing from this area, I consider spatial inequality not from the point at which neighborhoods become resource deserts, but from the historical processes that have created resource deserts. Research in urban sociology is helpful in this endeavor as this literature is comprised of decades of scholarship on population changes in cities with advancements in technology and infrastructure, de facto racial and economic segregation in cities and the policies and practices that encouraged this segregation, housing issues unique to urban spaces, and the social, economic, and health consequences of these urban problems. Environmental sociological literature explores the human-environment relationship as well as the sociological structures that shape human-environment interaction in ways that create inequality, burden, and risks as well as benefits. Employing this area of research, I situate spatial inequality and place attachment as two divergent illustrations of the structuring of human-environment relationship to perpetuate risk and benefit, respectively. Moreover, I engage environmental social psychology scholarship that aids in understanding the effects of spatial inequality in neighborhoods on affect, behavior, and cognition. Medical sociological literature investigates the social causes and patterns of health and disease, social aspects of the healthcare

provider-patient relationship, the functions of healthcare institutions and organizations, and the relationship between healthcare and other social institutions. Drawing from this area of scholarship, I recognize neighborhood contexts as consequential for health in both direct, behavior-oriented ways, but also in indirect, social and social psychological ways.

Causes of Spatial Inequality

I rely on three theoretical frameworks to engage issues of spatial inequality and highlight the manner in which race and racism both work in hand with space and are inherently tied to capitalist processes. First, taking an environmental justice (EJ) approach, the dissertation examines disproportionate access in the built environment across neighborhoods and draws from Bullard's (1990) concept of environmental racism to draw connections between institutional racism and inequality in access and exposure in neighborhoods. Robinson's (2000) theory of racial capitalism highlights how racialized economic processes create resource inequality across place, while Neely and Samura's (2011) theory of racial space helps to elucidate the manner in which race and space are interdependent and how this interdependence creates inequality. Thus, the dissertation utilizes these frameworks for designing each empirical study and interpreting empirical findings.

The environmental justice (EJ) framework addresses inequality across space and place. Literature in this area points to the physical environment as a site of inequality in terms of environmental burdens and benefits. Environmental justice emerged in the U.S. as a consequence of civil rights and anti-toxic movements, and now is being used not only in policymaking and academic research, but also for political debate and environmental campaigning around the world. Decades of research has shown that low-income Black, Brown, and indigenous communities bear the burden of disproportionate exposure to hazardous industry (Mohai et al 2009). Cemented by this empirical evidence, environmental justice work conceptualizes racism and classism as

structural factors that shape this spatial inequality through various pathways. Thus, taking an environmental justice approach, I focus on disproportionate access to material resources in the built environment and I argue that that this lack of access is consequential for health. Beyond taking an environmental justice approach to the dissertation, I utilize Bullard's (1990) concept of environmental racism that suggests that ideological *and* institutional racism undergird the overrepresentation of environmental toxics in Black communities. Bullard posits that this overrepresentation is directly associated with the underrepresentation of Blacks in zoning councils that yield the power to industries to site in certain neighborhoods as well as the historical racist processes that concentrate both Blackness and poverty in neighborhoods. I extend this theory of environmental racism to environmental amenities (i.e., the material resources in the built environment that are important for health and well-being).

Cedric Robinson's (2000) conceptualization of racial capitalism complements Bullard's theory of environmental racism in meaningful ways and involves the process of deriving social and economic value from the racial identity of another person. This conceptualization hinges on the idea that both racism and capitalism are two interdependent systems of oppression that work in tandem to systematically disadvantage and exploit Black people. Pulido (2000, 2016) builds on the work of Robinson and posits that racial capitalism emerges from the inability of both racism and capitalism to independently explain the complex processes undergirding the disinvestment and devaluation experienced by poor neighborhoods of color in the United States that often leads to environmental injustices. Focusing on the Flint Water Crisis as a case for analysis, Pulido (2016) emphasizes how racism can be harnessed by elites to expand power and profit and shape the environmental landscape of predominantly Black spaces as well as predominantly white spaces. This racialized nature of capitalism is apparent even when actions by economic actors do not

appear to be obviously racially motivated. By acknowledging that ideology and history inform and shape social, political, and economic processes, one can reframe issues of disproportionate burden of environmental hazards by Black communities as state sanctioned violence. Similarly, issues of disproportionate access for Black communities might also be framed in this manner. Racial capitalism highlights how racism is an ideological process, such that “Black neighborhoods” or communities perceived as “Black” are rendered valueless. This disposability of Black-occupied spaces can explain much of the governmental and societal responses to both natural disasters and man-made disasters faced by predominantly Black communities, as well as the alienation of Black residents during the phases of gentrification, and the lack of economic investment by government actors in Black neighborhoods.

Neely and Samura’s (2011) theory of racial space connects critical spatial theory with concepts of racialization to emphasize how race and space are intrinsically linked at both the micro- and macro-levels. Critical spatial theorists recognize space as a factor in the creation and maintenance of social inequality and as a tangible manifestation of systemic racial inequalities (e.g., land theft, racial residential segregation, displacement of indigenous populations). Thus, Neely and Samura (2011) posit that both race and space are defined by 1) contestation, 2) fluidity and historicity, 3) interactions and relationality and 4) difference and inequality. This perspective purports that environments have a race neutral façade but are actually sites of highly salient racial meanings and practices and reinforced hierarchies (Lowe, Stroud, and Nguyen 2017). Hence, meaning is assigned to the spaces racial minorities occupy (and those they do not), and this meaning shifts over time with fluctuations in perceived value, locations, and other occupancies. This interdependence between race and space highlights how racism and race shapes and is shaped and organized by spatial processes (e.g. siting of grocery stores, commercial properties, environmental

hazards). Neely and Samura's conceptualization of racialized space points to the spatial patterning of resource-desert neighborhoods in areas with a large concentration of racial/ethnic minorities (and conversely, the patterning of whiter neighborhoods as resource-rich areas) as not coincidental nor purely based on economic process but rather an incidence of race shaping space and space further organizing and stratifying racial groups.

Consequences of Spatial Inequality

To help understand how inequality in neighborhoods shapes health, I situate environmental racism and racial capitalism as drivers of racialized patterns of resource scarcity within literature on the stress process, and I position my concept of multiply-deserted areas within the stress process model in general, and the stress accumulation hypothesis in particular (Pearlin et al. 1981). The stress process model has become a central theoretical framework for understanding the mechanisms by which inequality has the potential to shape physical and mental health. A central idea of the stress process is that social statuses define the conditions of people's lives, such conditions create the context for differential exposure to stressful events and coping resources, and differences in health conditions arise from variations in exposure to stress and accumulation of resources (Pearlin 1983, 1989; Turner 2009).

A stressor refers to any environmental, social, or internal demand which requires an individual to readjust their usual behavior patterns and strains their coping strategies (Holmes and Rahe 1967; Thoits 1995). Stressors impact physical health by straining individual coping capabilities, eroding one's psychological and biological systems (e.g., immunosuppression, mental health disruption), and triggering health behaviors (i.e., smoking, binge eating, binge drinking) (Geronimus et al. 2006; Leslie and Cerin 2008; Miller and Townsend 2005; Williams and Mohammed 2009). In this dissertation, living in a multiply-deserted area is the stressor of interest. The conceptualization of

living in an MDA as an accumulative environmental stressor is a contribution to the stress literature which tends to focus on micro-level processes (e.g., job loss, divorce) (Wheaton and Montazer 2017).

While much of the work on the stress process and the relationship between racism, racial discrimination in its various forms, and physical and mental health have focused on perceived discrimination and perceptions of racialized interactions, less is known about the health effects of manifestations of larger, structural forms of racism and discrimination. Even studies that have examined the health effects of living in poverty, in racially segregated communities, near environmental toxics, or in communities without environmental amenities have examined this through either a purely psychological or purely physical health lens and examined these effects independently. By engaging the stress process model with an EJ-oriented, ecological lens, I assert both the direct and indirect ways that living in an MDA can shape the health and well-being of Black Americans in urban neighborhoods.

Place, Perceptions, and Attachment

To understand the ways that individuals' perceptions of place not only diverge from objective measures but are nuanced in ways that promote a connection to the geographical location, I engage literature on the process, causes, and consequences of attachment to place. Place attachment, a concept that symbolizes the connection between social psychological theory and environment/place, involves the formation of emotional and sentimental bonds between people and a place (Altman and Low 2012; Gupta and Ferguson 1997). Drawn from environmental psychology theories as well as social psychological theories of affect and emotion, this concept bridges the material nature of a geographic site with the cultural and psychological meanings we invest in them and is often engaged in research at the intersection of sociological social psychology

and urban geography (Hernandez et al 2007). This research demonstrates that factors such as length of residence, immigration status, degree of assimilation, neighborhood ties, and cultural capital affect place attachment (Lacy 2004; Lewicka 2005). Because social psychology has as its goal understanding the individual's relationship with the social world, a social psychological lens is adept at understanding how key aspects of the social world-environment and place-contribute to the social experiences and outcomes of people. Moreover, social psychology, with its inherent ability to link the micro-macro and mediate agency-structure, rejects the traditional sociological "space as container" argument and embraces the interplay of space, identity and agency (Gotham and Brumley 2002).

In this dissertation, I employ Scannell and Gifford's (2010) model of place attachment that offers a comprehensive, tripartite model of place attachment that includes three dimensions: person, psychological processes, and place. The psychological processes—*affect, cognition, and behavior*—reflect how individuals experience and express their attachment to a place (Scannell and Gifford 2014). These psychological processes reflect Low and Altman's (1992) earlier conceptualization of place attachment and are particularly interesting for understanding how individuals who live in resource-deprived areas experience such places and how this experience might impact individual feelings, emotions, and behaviors related to their neighborhood. Thus, this understanding is necessary for exploring residents' place attachment.

STATEMENT OF THE PROBLEM

With these theoretical frameworks, I conceptualize multiply-deserted areas as neighborhoods in which there is co-occurring, compounded resource scarcity in neighborhoods. These racialized spaces exist as consequence of the ongoing economic, social, and environmental disinvestment both created and sustained by environmental racism and racial capitalism. Access to resources,

namely healthy foods (via grocery stores) and prescription medicines (via pharmacies) have been demonstrated to impact diet, eating behaviors, medication adherence, and obesity/BMI (Hager et al 2017; Qato et al 2014; Walker et al 2010). Moreover, disparities in access to active greenspace such as parks and walking trails have been associated with significant health disparities, including obesity (Lachowycz and Jones 2011). That lack of access to healthy food destinations, pharmacies, and greenspace in the built environment shapes individual social outcomes in important and consequential ways situates this disproportionate access to material resources as an environmental justice issue. Thus, there is a need to further examine the race and class dimensions of neighborhood-level resource scarcity. This dissertation is a uniquely interdisciplinary mixed-method study that takes a spatial approach to the inequality-environment-health connection and widens the scope of environmental justice research.

RESEARCHER POSITIONALITY

Reflecting on my position as a primary investigator and how aspects of my own identity and experience shaped the dissertation from its inception until now is important. I am a Black, millennial woman from an urban city in the Deep South. My social location and life experiences have shaped the topic of my dissertation as well as the theories and areas of scholarship I considered, the data sources I drew on, and my interpretation of research findings.

The dissertation departs from traditional exploration of race, class, and inequality that takes a comparative approach to examine inequality across several different racial groups or research that centers whiteness (e.g., comparing white groups to nonwhite groups). Instead, the dissertation centers Blackness and Black people for empirical, theoretical, and methodological reasons. As a medical sociologist familiar with the dearth of attention in mainstream sociology on race, racism, and the health of Black Americans (Erving and Satcher 2021), I contribute to this area of research

by focusing on how this type of spatial inequality shaped predominantly Black neighborhoods in particular. Moreover, rather than pathologize race itself, I chose to draw from theories that emphasized structural *racism* as a basis not only for this spatial inequality uniquely faced by Black Americans, but also as a basis for the relatively poor health outcomes among Black Americans residing in resource-scarce neighborhoods. These theories frame structural and institutional responses to Blackness and Black spaces in such a way that denotes the unique invisibility, dispensability, and valuelessness of Black neighborhoods.

Additionally, the choice to center Blackness and Black Americans by including neighborhood designation as predominantly Black or not rather than compare across racial groups was methodologically sound as the urban cities that are included in this sample are largely Black-white cities. That is, neighborhoods were on average about 40 percent white and about 30 percent Black, so meaningful associations for *predominantly* Hispanic or Asian American neighborhoods were not numerically possible. Last, the focus on urban, southern U.S. cities was both a reflection of desires to contribute to urban studies outside the scope of northeastern and midwestern U.S. cities, but also to highlight issues of inequality, health, and the urban lived experience of inequality for Black Americans in the southern U.S.

CONTRIBUTION

This dissertation and its accompanying three studies will make several contributions to the literature. First, it introduces the concept of a multiply-deserted area (MDA), which conceptualizes compounded disadvantage in a way that recognizes racial capitalism and environmental racism at work. In this way, the dissertation extends the EJ framework to examine environmental inequality in *access* to material resources in the built environment. Second, the dissertation applies the stress process model in a novel and underutilized way by conceptualizing co-occurring resource scarcity

as an accumulative chronic strain that shapes health and well-being. This conceptual model bridges theories of environmental racism and racial capitalism with stress theory and highlights the basis and consequences of neighborhood spatial inequality. Moreover, this model aids in explaining any race and class variations in physical health outcomes across neighborhoods.

Third, in addition to more sharply analyzing inequality across space, the dissertation journeys from addressing larger, macro-level research questions on the patterns of inequality across space and health-related outcomes of this patterning in Chapters Two and Three to micro-level processes regarding individual perceptions of inequality and access and this relation to emotional bonds with place in Chapter Four. This integration of macro and micro levels of analysis is important for illuminating the complex, multilevel bearing of multiply-deserted areas on marginalized groups. Last, the dissertation coalesces four literatures (i.e., health & inequality, social psychology, urban studies, and environmental justice) in a way that encourages further interdisciplinary scholarship and highlights its fruitfulness.

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CHAPTER II

Multiply-Deserted Areas: Examining Food, Pharmacy, and Greenspace Deserts in the Urban

South

INTRODUCTION

Scholars interested in urban spatial inequality have explored how neighborhood demographics are related to the access and availability of various resources for residents of these neighborhoods (Hager et al 2017; Small and McDermott 2006; Walker, Keane, and Burke 2010). This research demonstrates inequality across race and class lines in the quantity and quality of social, economic, and health-related resources, and it designates areas with a shortage of these resources as “[resource] deserts” (Pruitt and Colgan 2010; Qato et al 2014; Sister, Wolch and Wilson 2010). Not unlike other spheres of inequality in the U.S., deserts exist most frequently in neighborhoods with a high concentration of racial/ethnic minorities, immigrants from the global South, and poverty (Walker, Keane, and Burke 2010; Zenk et al 2006). These patterns of neighborhood-level resource scarcity have the potential to impact health and life outcomes.

The term *desert*, defined as an area with limited resources of some sort, was first introduced in the policy arena by scholars describing food desert communities in which there is little or no access to healthy food choices (Beaumont et al 1995; Deener 2017). This pattern of healthy food scarcity in areas of socioeconomic decay is echoed throughout the spatial inequality literature for other resources, including pharmacies, parks, and healthcare services (Hendrickson et al 2006; Ko and Ponce 2013; Qato et al 2014; Sister, Wolch and Wilson 2010; Walker, Keane, and Burke 2010).

With few exceptions, current research on resource deserts assumes they exist in isolation in communities and/or examines these types of deserts in isolation (Cohen et al 2016; Small and

McDermott 2006; Smiley et al 2010). While examining single resources reveals the racialized and classed patterns of specific resource inequality, an inquiry into whether and how neighborhoods exist as deserts of multiple resources can reveal a more comprehensive understanding of spatial inequality. Drawing from work in urban sociology and environmental justice studies that conceptualizes racism as a structural factor that shapes inequality through various routes, this chapter examines sociodemographic patterns of resource scarcity (i.e., deserts) in the urban South. Focusing on access to supermarkets, parks/trails, and pharmacies, the current study contributes knowledge on spatial inequality by examining the relationship between neighborhood characteristics (namely race and class) and the existence of said neighborhoods as single or multiple resource deserts. Moreover, the current study examines what types of deserts co-occur and how this varies according to race and class. Further, this study focuses on urban cities in the southern U.S., an under researched region in this area of scholarship.

BACKGROUND AND THEORY

The Demography of Inequality & (Un) Just Deserts

Throughout the past several decades, racial/ethnic minorities and those with low socioeconomic status have become increasingly concentrated and isolated in low-income urban neighborhoods. As the demographic character of urban neighborhoods changed during the twentieth century, so did the resources available in those neighborhoods (Rieniets 2009). Racial segregation, along with economic segregation, has been implicated in the development of economically disadvantaged neighborhoods, which in turn limits residents' access to quality jobs, education, safety, social networks, and health care (Morenoff and Sampson 1997; Williams and Collins 2016; Wilson 1987). Moreover, racial segregation has been driven largely by both institutional and individual racism (Charles 2003; Massey and Denton 1993; Rothstein 2017) as

demonstrated by fair-housing audits and mid-to-late twentieth century financial redlining practices (Massey 2005; Yinger 1995). As racially segregated neighborhoods are more likely to be economically disadvantaged (Lichter, Parisi, and Taquino 2012; Massey 2001), it is important to extricate the impact of segregation versus poverty on social outcomes. For example, Zenk et al. (2005) found a positive relationship between distance to supermarkets and neighborhood racial composition only in high poverty areas when compared to low poverty areas. This interaction between neighborhood racial composition and neighborhood socioeconomic status poses a challenge in inequality research. It can be difficult to parse out whether race or class represents the fundamental causal factor of inequality or, if both in part predict inequality, to what extent race and class are responsible. Despite this challenge, research on deserts presents an opportunity to examine the interdependent relationship between race and class across space in relation to resource scarcity.

The lack of access to and availability of a resource that creates desert neighborhoods may be the result of the resource leaving the area or having never been there. This highlights the spatial component of deserts, where space and geographical location become barriers to accessing resources. Current research on urban deserts suggests that disinvestment and resource inequality strike areas with racial minorities, low economic appeal, high poverty, and high crime rates in urban contexts (Gaskin et al 2012; Kwate et al 2013). While spatial inequality in the form of limited or no access to resources can exist for different types of resources, supermarkets, pharmacies, and active greenspaces are uniquely important for the health and well-being of neighborhood residents. These resources have both direct and indirect implications for health outcomes, particularly for people whose health is influenced by other social determinants.

Research on inequality in food availability has defined neighborhoods with low access to healthy and affordable foods as food deserts (Walker, Keane, and Burke 2010). This area of research has received fervent attention from government actors and activists and informed local, state, and national urban planning policies. Food deserts are more prevalent in areas with high concentrations of poverty as well as neighborhoods with high concentrations of racial/ethnic minorities (Richardson et al 2012; Walker, Keane, and Burke 2010). Moreover, research on access to food destinations demonstrates that poorer residents tend to lack access to transportation to chain supermarkets and generally pay more for groceries from local groceries (Chung and Meyers 1999; Lamichane et al 2013; Raja et al 2008). Likewise, Black neighborhoods have fewer supermarkets, poorer quality foods in local stores, and Blacks travel farther to grocery stores¹ (Block and Kouba 2006; Moore and Diez-Roux 2006).

Pharmacy deserts research has gained momentum in recent years as scholars more deeply interrogate the health-place connection. Pharmacy deserts are more prevalent among neighborhoods with a high concentration of Blacks compared to neighborhoods with a high concentration of whites or more racially heterogeneous neighborhoods (Chisholm-Burns 2017; Qato et al 2014). Likewise, Amstislayski et al (2012) find that poorer urban areas have less geographic access to pharmacies than middle-class or low poverty neighborhoods, and the pharmacies in these poor neighborhoods have limited to no availability of commonly prescribed medications. Though measuring access to pharmacies to fill prescriptions is a relatively new area of research, factors influencing medication adherence have long been considered (Rolnick et al 2013; Shrank et al 2006). For example, research by Welty et al (2010) examining the association

¹ This association is consistent when food deserts are measured in terms of access to healthy food and supermarkets, but when measuring food deserts based on access to fast food restaurants and unconventional “healthy” food destinations such as convenience stores and dollar stores, the findings are mixed (Zenk and Powell 2008).

between limited transportation and medication adherence among epilepsy patients shows that both ability to drive and distance to the pharmacy are associated with medication adherence. Interestingly, living farther than four miles from a pharmacy was associated with greater difficulty getting medications filled on time. This association between spatial access to pharmacies and an important health-related behavior highlights how physical ability might impact access. Thus, a fuller examination of how race and class predict access to pharmacies will fill gaps in this unique area of medical desert research and provide more insights into the barriers faced by individuals experiencing poor health.

Race and class patterns of access have also been examined in contemporary environmental justice research. Widening its scope of interest beyond traditional examinations of environmental risks/burdens toward environmental amenities, environmental justice (EJ) research and activism has examined unequal access to urban green space across race and class lines (Jennings et al 2012). Recent environmental justice research on green space has centered around fair access to natural resources and the uneven distribution of urban green space; thus, race and class disparities in spatial access to greenspace in metropolitan cities are well-established (Dai and Wang 2011; Gould and Lewis 2012; Heynen, Perkins, and Roy 2006; Sister, Wilson, and Wolch 2010). For example, Saporito and Casey (2011) find that areas with low-income residents and racial minorities have much less vegetation (i.e., parks, grass, tree cover) than whiter, wealthier areas, and this disparity is even greater in more racially or economically segregated cities. Furthermore, the design and placement of parks in urban communities fail to meet the needs of its vulnerable and socially disadvantaged members (Byrne 2007), and neighborhoods with a higher proportion of African Americans, renters, and low-income residents have drastically fewer trees on public right of ways (Landry and Chakraborty 2009). Even environmental non-profit organizations plant more trees in

poor white neighborhoods than in poor Black neighborhoods (Watkins et al. 2017). Though we now know much about how access to certain greenspaces might positively impact health as well as what factors might mediate this association (Jennings, Larson and Yun 2016; Lachowycz and Jones 2013), further research into how active greenspaces such as parks and walking trails are distributed across neighborhoods is necessary.

Multiply-Deserted Areas in The Urban South

I define a multiply-deserted area as a community or neighborhood in which there is a shortage of multiple social, economic, and/or health-related resources. Capitalism creates patterns of resource shortages in which poor communities are not deserted in an isolated manner—food deserts do not exist separately from healthcare deserts but are likely co-occurring with other desert types in impoverished urban neighborhoods. Thus, framing resource-scarce, urban neighborhoods as MDAs creates a multilayered, cumulative perspective of degraded places. Moreover, acknowledging the inherent racist and capitalist ideologies that guide the economic and historical processes that have both directly and indirectly situated certain groups in these racialized spaces implicates these spaces as sites of state-sanctioned violence and infrastructural exclusion (Deener 2017; Wilson 1987; 2009). I posit that this compounded material depravity negatively affects the quality of life of persons living and working in these neighborhoods. The possible physical, economic, social, and psychological consequences of living in MDAs highlight the need for scholars engaging issues of spatial inequality to broaden their focus into the simultaneous institutional and environmental racism faced by low-income and Black communities.

Much of the scholarship on food, pharmacy, and greenspace deserts in urban cities has studied access to each of these resources in isolation. Examining whether and how neighborhoods exist as deserts of multiple resources can reveal a more complex understanding of spatial inequality than observing single resources independently. In one study of neighborhood access to multiple

organizational resources (i.e., childcare, grocery stores, banks, pharmacies, convenience stores), Small and McDermott (2006) examine density of resources across zip code areas in the U.S. and find that increases in poverty rate were related to increases in smaller resource establishments (e.g., small grocers), and decreases in larger grocery stores and establishments. Additionally, increases in proportion Black residents were associated with decreases in resource establishments in general. Smiley et al (2010) examine multiple health-related resources including supermarkets and parks in block groups in three U.S. cities and find that neighborhoods with higher proportions of Black residents tend to have lower densities of each of these resources. More recently, Anderson (2017) examines how the distribution of health-related organizations throughout zip code areas differs by the racial/ethnic composition of such areas and finds that Black residential clustering in these areas is inversely related to the number of health-related organizations, including food resources, physical fitness facilities, health care resources, civic associations, and social service organizations. Small and McDermott (2006), Smiley et al (2010) and Anderson (2017) each examine the density of resources in their studies of spatial inequality. However, a neighborhood with a low density of resources and a neighborhood without any resources at all within reasonable distance are two distinctly different ways of conceptualizing spatial access. Building on these works, I focus on neighborhoods having either any or no spatial access to these resources. Moreover, I focus on supermarkets/grocers, pharmacies, and parks/walking trails as each are important resources with direct implications for health and well-being.

In addition, I examine thousands of neighborhoods across 17 counties in the southern United States, adding breadth to this type of research. Economic research on urban cities across America suggests that the U.S. is vastly different from the southeastern U.S. in terms of per capita income and economic performance/vitality at the regional, state, and county level (Baker 2020;

Nunn, Parsons, and Shambaugh 2018). In addition, the “*way*” and “*when*” in which southern urban cities in the U.S. came to exist is also unlike Northeastern urban cities, with the northern urban city being both older and denser (Goldfield 1997; Michney 2009). What’s more, the sociodemographic makeup of southern urban cities based on immigration/emigration patterns, housing and urban policies of the 20th century, and the rise of the Black upper middle class in cities like Atlanta, GA and Fort Washington, MD, is distinct from urban cities in other parts of the U.S. (Kirk 2005; Inwood 2011; Pendergrass 2013). Specifically, Black residential location (in the past and today) is not only a function of their political and economic status, but also the degree of residential segregation of cities, all of which have been shaped by racial dynamics and processes that are historically specific to the southern United States (Roscigno and Tomaskovic-Devey 1994). Additionally, similar work by Small and McDermott (2006) suggests that regional contexts differentially shape access to resources—they find that impoverished neighborhoods in the southern and western United States generally have more resource establishments than the poor neighborhoods in the Northeast and Midwest. Thus, examining patterns of resource inequality in urban neighborhoods in the south is merited.

Theoretical Framework & Hypotheses

Racism is manifested not only in interpersonal interactions, but also through institutionalized racial discrimination that is the direct cause of the wide-scale social, economic, and environmental disinvestment of communities of color. This comprehensive disinvestment results in the emergence of poverty and simultaneously occurring resource deserts that create contexts for further resource desertion. I use two models of inequality employed in environmental justice research to explain environmental inequality: economic inequality and environmental racism. These models bring to bear larger theoretical frameworks of racial capitalism (Robinson 2000) and racialized space (Neely and Samura 2011) and environmental justice work by Bullard

(1990, 1993) and Taylor (2000, 2014) examining the characteristics associated with environmental risk.² The economic inequality model and environmental racism model reflect a long-standing, ongoing debate in environmental justice research in particular and in research on inequality in general. Each model implies distinct hypotheses regarding the association between race and class inequality and resource scarcity.

The environmental racism model suggests that a neighborhood's lack of resources is twofold. Resource scarcity is directly related to racialized processes of residential segregation, "steering" by realtors, and bank redlining, as well as the actions of industry actors and corporate leaders who deliberately avoid siting commercial properties in predominantly Black neighborhoods. This aversion to predominantly Black neighborhoods is often consistent regardless of the socioeconomic status of the neighborhood and potential economic gains (Pellow 2000; Pulido 2000). In his groundbreaking book, *Dumping in Dixie*, Bullard (1990) describes environmental racism as an ideological and institutional facet of racism that underlies the overrepresentation of toxic hazard sites in Black communities. Bullard posits that this overrepresentation is directly associated with the underrepresentation of Blacks in zoning councils that yield the power to industries to site in certain neighborhoods. This sentiment is underscored by Cedric Robinson's argument that racism permeates societies to such an extent that Black neighborhoods are deemed valueless for economic development and dispensable for toxic industry development (Robinson 2000). The attention to not only the institutional, but the larger structural and historical processes embedded with racism that undergird environmental racism and racial

² Neighborhood resource inequality has also been examined through the lens of urban organizational sociology (Wilson 1987; Small and McDermott 2006). Despite its use in studies involving environmental hazard siting and/or disproportionate exposure to environmental toxics, environmental racism and environmental justice work can and does include examinations of disproportionate access to environmental amenities—including material amenities in the built environment (i.e., grocery stores, public transportation, and parks) (Bullard 2003; Taylor 2011).

capitalism is what makes these theories more suitable than organizational theories for this particular study. In sum, this model suggests the following:

H1: Neighborhoods (census tracts) with a higher concentration of Black residents will be more likely to be MDAs relative to those with a lower concentration of Black residents.

The economic inequality model suggests that both industry/commercial actors and residential consumers are rational economic actors (Been 1994). Thus, industry actors weigh potential liability and property costs and choose to site commercial properties such as pharmacies and supermarkets in the most cost-effective neighborhoods. These processes unsurprisingly disadvantage poorer people and neighborhoods (Yandle and Burton 1996). Thus, economic processes lead to neighborhoods with a high concentration of poverty and simultaneously scarce food, pharmacy, and greenspace resources. This model suggests the following:

H2: Neighborhoods (census tracts) below median household income will be more likely to be MDAs than neighborhoods above median household income.

In 2019, a white elected official of Maryland referred to Prince George's County— a predominantly Black and very affluent county— as a “nigger” county, suggesting that the overwhelming wealth achieved by Blacks in that county does not overshadow their blackness and the devaluation of their blackness by those in power. Continuing the race-class debate in EJ research and attempting to further investigate the American race-class correlation that makes it challenging to decipher an independent race or class effect, I set Hypotheses 1 and 2 against each other. The third model suggests the following:

H3: After adjustments for neighborhood income, the association between concentration of Black residents and MDAs will remain statistically significant.

Previous studies that have explored how blackness interacts with class to impact a variety of health, well-being, and life outcomes has shown that Blacks do not reap the benefits of various socioeconomic resources (i.e., education, income, occupational status, wealth) to the same extent that their non-Black counterparts do (Boen 2016; Oliver and Shapiro 1997; Pattillo-McCoy 1999). To explore how race and class may interact to uniquely shape experiences of both low-income and high-income Blacks, the fourth model suggests the following:

H4: Predominantly Black neighborhoods with higher median household income will be more likely to be an MDA than high income neighborhoods that are not predominantly Black. Similarly, low-income, predominantly Black neighborhoods will be more likely to be an MDA than their low-income, not predominantly Black counterparts.

DATA AND METHODS

Data and Sample

This study specifically focuses on the urban South. I define “south” using the specifications of the U.S. Census Bureau. I selected one county from each of the 16 southern U.S. states. The study sample includes all populated census tracts from each county and Washington, DC (N=3011). Each county to be included in the sample from each state was chosen based on population density, racial and socioeconomic heterogeneity, and median household income. Though some states in the sample had two counties that fit urban criteria, choosing one county allowed me to equally represent each state in the sample (including those that only had one county that was remotely urban—West Virginia). Moreover, as much of this *neighborhood-level* data was collected by the sole author, time and resources limited a more comprehensive sample of every urban neighborhood in each of the 17 state/areas.

Population/population density mattered because it has been a key facet of urbanity as defined in the literature (Carnahan, Gove and Galle 1974). Racial heterogeneity was also an important factor in sampling because of how inequality in urban metro areas occurs in racialized patterns in the deserts and neighborhood effects literature (Turley 2003; Wilson 1987). Moreover, racial minorities and immigrant populations are usually aggregated in urban centers throughout the country (Caldeira 2012). For similar reasons, percentage of population at or below the poverty level and median household income also shaped the selection of counties from each state as the literature suggests that among urban metro areas, income inequality is at its highest and poverty is concentrated, particularly in the southeast U.S. (Sharma 2017). Thus, counties in the final sample most exemplified “urban” in southern U.S. contexts (Lloyd 2012; Robinson 2014).³

The study sample includes census tracts from 17 counties (listed in Table 6 in Appendix). Census tracts are routinely used as proxies for neighborhoods as they are a good approximation of a neighborhood environment with reliable social and economic data available from the U.S. Bureau of the Census and are designed to be relatively permanent over time (U.S. Census Bureau n.d.). Census tracts include approximately 4,000 people, and boundaries are delineated to encompass a relatively demographically and economically homogenous population. In addition, census tracts adhere to visible geographic boundaries (Foster and Hipp 2011; U.S. Census Bureau 2018).

Dependent Measure

The paper examines MDAs by focusing on spatial access to three resource types. Research on spatial inequality wavers between the ½ mile and 1-mile limit when examining access in urban

³ These factors are commonly used in designating urban/rural status by the U.S. Census. Nearly all (96%) of the census tracts in the sample are federally-designated “urban” census tracts.

areas (Ver Ploeg, Dutko, and Breneman 2015). As this research centers on urban cities in the southern U.S., I argue that these cities develop differently than urban cities in the Midwest and Northeast U.S. Southern U.S. cities are often less compact than their northeastern and midwestern counterparts, thus a ½ mile buffer would result in an overly sensitive measure of access⁴.

Three resource desert types were used to construct the MDA measure. First, food desert measures were taken directly from the U.S. Department of Agriculture (USDA) Food Access Research Atlas (Economic Research Service (ERS) USDA 2015), which offers census-tract level data on food access. These data were dichotomously coded based on whether or not at least 500 people, or 33 percent of the population, lived more than 1 mile from the nearest supermarket, supercenter, or large grocery store.⁵ Food access was limited to just these food destinations because research has shown that superstores serve as an important source of produce year-round (Chung and Meyers 1999).

Second, the green desert measure assesses access to a park, sports playing field, walking trail, or botanical garden within each census tract. Address data for each of these types of green space were collected from city and county parks and recreation websites for every county in the sample and these data were geocoded using ArcGIS software. Spatial analyses were conducted using ArcGIS tools and census tracts were dichotomously coded based on whether there were one or more greenspaces within a 1-mile, straight-line distance of the population centers of each census tract.⁶

⁴ Supplemental analysis using the ½ mile buffer supports this assertion; nearly all (96%) of neighborhoods were a desert of some kind using this measure and approximately 75% of neighborhoods were multiply-deserted areas.

⁵ Defined as food stores with at least \$2 million in annual sales and containing all the major food departments (Economic Research Service (ERS) USDA 2015)

⁶ Neighborhood spatial inequality has been measured many ways, including place-based measures using straight-line/Euclidean distance or street-network distance (Sparks et al 2011; Leete et al 2012), travel time-

Third, pharmacy desert measures assessed access to a pharmacy within each census tract. Address data for every retail, clinic, or hospital pharmacy within each county was collected from the National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) registry, which offers name and address data for all pharmacy organizations licensed by the Drug Enforcement Agency (DEA) in the U.S. These data were geocoded using ArcGIS software. Spatial analysis was conducted using ArcGIS tools and census tracts were dichotomously coded based on whether there were one or more pharmacies within a 1-mile, straight line distance of the population centers of each census tract.

The MDA measure represents a census tract in which there is an absence of more than one kind of resource. Census tracts are dichotomously categorized as an MDA (1) or not (0) based on being a food, pharmacy, and greenspace desert concurrently or any combination of two of these types of deserts (i.e., food-green, food-pharmacy, pharmacy-green). Census tracts with only one kind of desert were dichotomously coded accordingly as food only, pharmacy only, or greenspace only deserts. Moreover, census tracts that were neither food, pharmacy, nor greenspace deserts were also dichotomously coded as not deserted.

I also constructed a nuanced measure of co-occurring resource scarcity. Census tracts were coded according to whether resource scarcity was high (food, green, and pharmacy desert); medium (food-pharmacy or food-green or pharmacy-green); low (food only, green only, pharmacy only); or no deserts. This variable measures resource scarcity in a heterogenous, cumulative sense (0-3).

based measures, and transportation-option measures (McKenzie 2014). In line with the food desert measure, which uses straight-line/Euclidean distance, I follow suit using Euclidean distance for the green and pharmacy desert measures. Moreover, in a study comparing Euclidean and street network-based measures of access, Sparks, Bania, and Leete (2011) show that Euclidean distances generate the same relative pattern of food access as do network distances.

Independent Measure

Race and class are the key independent measures in the study. Both measures were obtained from 2013-2017 5-year estimates of the American Community Survey census data for each census tract in each county. The race/ethnicity measure was constructed using the percent Black alone variable (M=36.77, SD=31.91). Neighborhoods were coded on whether they were predominantly Black, moderately Black, or marginally Black (1-3). I calculate the measure of predominance as greater than or equal to one standard deviation above the mean percent Black residents (i.e., 68.7), while moderately Black represents having a Black population that is above the mean but less than 1 standard deviation above the mean. The marginal Black measure represents having a Black population below the mean. The class measure is the median household income within a census tract. Median household income represents the amount that divides the neighborhood income distribution into two equal groups, half having income above that amount, and half having income below that amount.

Other Covariates and Controls

With exception of the opportunity zone measure, each of these controls were obtained from American Community Survey (ACS) census-tract data. *Nativity status* is assessed by the percent foreign born within a census tract. I include this measure as nativity is routinely used in studies of access to neighborhood resources (see Small and McDermott 2006). This is particularly interesting as urban cities in the south continue to be common immigrant destinations (Johnson-Webb 2002; Winders 2006). A *mobility* measure indicates the percentage of employed individuals who walk to work: this is an indirect measure of access to public or personal transportation on a regular basis, as research has shown that transportation access can be a barrier to access to food stores even when residents have spatial access (Dai and Wang 2011). However, because walking to work might also

be a convenience and marker of privilege in some neighborhoods, I also included the *percentage of households with no vehicle*, which more directly measures access to personal transportation. Housing measures included percentage of housing units that are *owner-occupied*. This variable is included as an indirect measure of neighborhood socioeconomic status. *Population density* and *area* were also controlled for at the census-tract level as these variables are consequential for examinations of spatial inequality. Lastly, I control for neighborhood economic potential via federal designation as an *opportunity zone*⁷.

Analysis

I first provide descriptive statistics for key dependent and independent variables (Tables 1 and 2). Next, I use binary logistic regressions to test the main hypotheses using the binary MDA measure (Table 3). Results are reported as odds ratios (OR). Odds ratios *greater* than 1 indicate that the event (a neighborhood being an MDA) is *more* likely to occur with a 1-unit increase in the predictor, and vice versa.

I then use multinomial logistic regression⁸ to analyze the *type* of resource scarcity (Table 4). Multinomial logistic regression is appropriate for examining multiple categories of a dependent variable simultaneously and provides relative risk ratios (RRR). Relative risk ratios greater than 1 indicate that the risk of the neighborhood being a single resource desert or a desert of two types of resources is increased as the predictor increases, relative to the comparison group (resource scarcity of three types), and vice versa.

Next, I use ordinal logistic regression to analyze the co-occurrence of resource scarcity (Table 5). Ordinal logistic regression is appropriate for ordinal dependent variables and provides

⁷ For a description and evaluation of the federal opportunity zone program, see Eastman and Keading (2019)

⁸ Due to a small N at the county/state level and doubt that one county per state would capture any state differences, multilevel modeling was not used.

proportional odds ratios (POR) that are similar in interpretation to odds ratios. Because these regression models fail to account for spatial dependence across census tracts (i.e., that resource-scarce neighborhoods may cluster together in a nonrandom way), analysis also includes a test of spatial autocorrelation using Global Moran's *i*. Results of this test indicate minimal spatial autocorrelation across the sample ($p < 0$, Moran's $i = .004$). Geocoding and spatial analysis are conducted in ArcGISPro, and all other statistical analyses are conducted in R.

RESULTS

Descriptive Statistics

Table 1 provides descriptive statistics for the dependent measures. Nearly one-third (.31) of the neighborhoods in the sample are MDAs ($n=934$), while more than half (.58) are at least one kind of resource desert ($n=1760$). Low resource scarcity neighborhoods are the most frequent (.27), followed by medium (.21) and high (.10) resource scarcity neighborhoods. Additionally, neighborhoods that are food deserts only are the most common (.14) among resource scarce neighborhoods, followed by neighborhoods that are green deserts only (.10) or food-pharmacy-green deserts (.10). Neighborhoods that are food-pharmacy deserts (.08), pharmacy-green deserts (.07), and food-green deserts (.06) each accounted for less than 10 percent of the sample, while neighborhoods that are pharmacy deserts only were the least common (.03).

[Table 1 placed about here]

Table 2 provides descriptive statistics for the independent measures and controls. Black non-Hispanics make up 36.77 percent of residents in neighborhoods in the sample ($SD=31.91$). Nearly a quarter (.23) of the neighborhoods in the sample are predominantly Black (i.e., 68.7% Black or more), 18 percent (.18) of neighborhoods in the sample are moderately Black (i.e.,

between 36.8 – 68.6% Black), and over half (.59) of the sample are marginally Black neighborhoods (less than 36.8% Black). The average median household income is \$61,078 (SD=\$33,411). With regards to nativity, the mean percentage of foreign-born residents in each neighborhood in the sample is 14.65 (SD=13.33). Additionally, the mean percentage of owner-occupied housing units is 55.64 (SD=23.89) and the mean percentage of households without a vehicle is 10.68 (SD= 11.65). The average area of each neighborhood is 3.08 sq. miles (SD=9.4), and the mean population density for neighborhoods is 5018.3 residents per square mile (SD=5652.2). Lastly, 11 percent of neighborhoods in the sample are federally designated opportunity zones.

[Table 2 placed about here]

Resource Scarcity

Table 3 provides results of binary logistic regression of the dichotomous MDA measure of resource scarcity where 0 = no scarcity or singularly-resource scarce and 1= resource scarcity of 2 or more types (MDA). Model 1 of Table 3 shows the odds ratio for the individual effects of the presence of Black residents in neighborhoods. There seems to be no statistically significant association between moderately Black neighborhoods (i.e., 36.7-66.6 percent Black) and the likelihood to be an MDA relative to neighborhoods that are marginally Black (i.e., less than 36.7 percent Black). Contrastingly, predominantly Black neighborhoods (i.e., more than 66.7 percent Black) are more than two and a half times as likely to be an MDA compared to neighborhoods marginally Black (OR=2.786, $p<.001$). Model 2 shows the odds ratio for the individual effect of median household income. This association is non-significant. To assess collective effects of both race and class, Model 3 includes both independent variables in the same model. Moderately Black

neighborhoods continue to show no association with the likelihood of being an MDA, while predominantly Black neighborhoods are nearly three times more likely to be an MDA compared to marginally Black neighborhoods (OR=2.913, $p<.001$). Median household income remains statistically non-significant. Model 4 includes the full model with interaction terms between both moderately and predominantly Black and median household income. The statistical interactions for both moderately Black (OR=1.165, $p<.01$) and predominantly Black (OR=1.132, $p<.01$) are significant. For ease of interpretation, Figures 1 and 2 provides a graphical representation of the race-class interaction. The figures show a steep increase in the probability that a neighborhood will be an MDA as median household increases for both moderately and predominantly Black neighborhoods relative to marginally Black neighborhoods.

[Table 3 placed about here]

[Figure 1 placed about here]

[Figure 2 placed about here]

In addition to examining MDAs in general, I explore whether the race and class composition of neighborhoods is also associated with MDA *types* (e.g., differing combinations of food, pharmacy, and greenspace scarcity). Table 4 provides results of multinomial logistic regression of the type of resource scarcity. The table shows relative risk ratios for the collective effects of moderately and predominantly Black residents and median household income. Each column represents each type of resource scarcity relative to a food-pharmacy-green desert

neighborhood. A predominantly Black neighborhood has a decreased risk of being a food desert-only relative to being a food-pharmacy-green desert (RRR=.259, $p<.001$). This pattern is consistent across most desert types— a predominantly Black neighborhood has a decreased risk of being a green desert only (RRR=.386, $p<.001$), a pharmacy desert only (RRR=.375, $p<.001$), a food-green desert (RRR=.321, $p<.001$), a food-pharmacy desert (RRR=.953, $p<.001$), and a pharmacy-green desert (RRR=.463, $p<.001$) relative to being a food-pharmacy-green desert. Predominantly Black neighborhoods have the lowest relative risk of not being a desert of any kind relative to being a food, pharmacy, and green desert (RRR=.167, $p<.001$). Taken together, these results suggest that in general, predominantly Black neighborhoods are more likely to be three-resource deprived than singularly or doubly deprived. Similarly, moderately Black neighborhoods also have a decreased risk of being a food desert only (RRR=.796, $p<.001$), pharmacy desert only (RRR=.434, $p<.001$), green desert only (RRR=.618, $p<.001$), food-green desert (RRR=.878, $p<.001$), food-pharmacy desert (RRR=.729, $p<.001$), pharmacy-green desert (RRR=.463, $p<.001$), and not being a desert of any kind (RRR=.554, $p<.001$) relative to being a food-pharmacy-green desert.

Across moderately Black and predominantly Black neighborhoods, the effect size is larger for moderately Black neighborhoods when it comes to being a food desert only, pharmacy desert only, green desert only, and a food-green desert. This suggests that the reduction in risk for moderately Black neighborhoods (i.e., the likelihood of being three-resource deprived rather than singly or doubly- deprived) is *less* than that of predominantly Black neighborhoods. Food-pharmacy and pharmacy-green desert neighborhoods are the exception. Here, the effect size is smaller for moderately Black neighborhoods compared to predominantly Black neighborhoods. This suggests that the reduction in risk for moderately Black neighborhoods (i.e., the likelihood of

being three-resource deprived rather than singly or doubly- deprived) is greater than that of predominantly Black neighborhoods.

In terms of median household income, contrary to expectation, higher median household income is associated with a *decrease* in the relative risk of being a food desert only (RRR=.941, $p<.01$); a pharmacy desert only (RRR=.872, $p<.001$); a food and pharmacy desert (RRR=.941, $p<.05$); or a pharmacy and green desert (RRR=.934, $p<.05$) compared to being a food, pharmacy, and green desert. In contrast, neighborhoods with a higher median household income have an *increase* in the relative risk of being a food and green desert (RRR=1.073, $p<.01$) or a green desert only (RRR=1.042, $p<.05$) relative to a food-pharmacy-green desert. These mixed findings suggest that whether wealthier neighborhoods are more likely than lower income neighborhoods to be only singularly or doubly deprived than three-resource deprived depends in part on which resource is scarce.

[Table 4 placed about here]

Table 5 provides results of ordinal logistic regression of compounded resource scarcity. Model 1 shows that, when examined individually, a neighborhood that is predominantly Black has more than two and a half times the odds of more compounded resource scarcity (POR=2.549, $p<.001$) relative to marginally Black neighborhoods. Similarly, moderately Black neighborhoods have 25% higher odds of more compounded resource scarcity relative to marginally Black neighborhoods (POR=1.254, $p<.05$). Model 2 shows no association between median household income and compounded resource scarcity. To assess collective effects of both race and class measures, Model 3 includes both independent variables. Results show that predominantly Black neighborhoods have more than twice the odds of compounded resource scarcity (POR=2.698,

p<.001) while moderately Black neighborhoods have 30% higher odds of compounded resource scarcity (POR=1.305, p<.05) relative to marginally Black neighborhoods. A neighborhood with higher median household income also has 3% higher odds of compounded resource scarcity (POR=1.037, p<.05). Model 4 includes the race-class interactions for moderately Black (POR=1.099, p<.05) and predominantly Black (POR=1.126, p<.01) neighborhoods; results suggest that both moderately and predominantly Black neighborhoods with high median household income are more likely to be MDAs relative to neighborhoods with high median household income that are marginally Black as well as low-income moderately or predominantly Black neighborhoods.

[Table 5 placed about here]

In sum, I find support for Hypotheses 1, 3, and 4. In terms of multiple resource scarcity, predominantly Black neighborhoods are more than twice as likely to be MDAs than marginally Black neighborhoods (Hypothesis 1). This finding is consistent for MDA type; predominantly Black neighborhoods are more likely to be co-occurring food, pharmacy, and greenspace deserts than being singularly deprived as food only, pharmacy only, or greenspace only deserts as well as doubly deprived (food-green, pharmacy-green, food-pharmacy). This finding reiterates consistent evidence of disadvantage of predominantly Black neighborhoods in terms of co-occurrence of resource scarcity. Overall, these findings hold even after adjustment for median household income, thereby providing strong evidence in support of Hypothesis 3.

Though binary logistic regression analyses provide no support for Hypothesis 2, multinomial logistic regression analyses (Table 4) provide partial support for Hypothesis 2. However, this finding is dwarfed by the overwhelming counterintuitive findings related to median

household income in these analyses as well as in ordinal logistic regression analyses (Table 5). These findings show that increases in median household income are associated with a *greater* likelihood of experiencing compounded resource scarcity. The race-class interaction analyses offer a better understanding of these findings— results demonstrate that higher median household income is associated with greater likelihood that a neighborhood is an MDA for *moderately Black and predominantly Black neighborhoods in particular*. The null effect of higher income is only apparent for neighborhoods that are marginally Black. Thus, I find overwhelming support for Hypothesis 4.

DISCUSSION

The present study examined resource scarcity across urban neighborhoods in the south. More than half of neighborhoods in urban cities in the southern U.S. have resource scarcity of at least one of the three types examined in the study (food, pharmacy, greenspace). More importantly, more than one-third of neighborhoods in urban cities in the southern U.S. are multiply-deserted areas, which signals that compounded, co-occurring resource scarcity is not an anomaly for the urban South. Guided by an environmental justice (EJ) framework, this multi-state study sought to determine the race and class patterns of resource scarcity across neighborhoods. Results suggest that neighborhoods where Black residents are an overwhelming majority are more likely to be resource scarce neighborhoods. Additionally, predominantly Black neighborhoods are more likely to have more intense, compounded resource scarcity than other, less Black neighborhoods. For example, predominantly Black neighborhoods are more likely to be co-occurring food, pharmacy, and greenspace deserts than being only food deserts or being a food desert *and* a greenspace desert.

The EJ framework that guided this study emphasizes two, often opposing, theoretical models that explain environmental inequality: economic inequality and environmental racism. These models are often used in cases where neighborhoods of color and/or low-income

neighborhoods are disproportionately burdened by environmentally toxic industry sites or contamination of natural resources by industry by-products. In the current study, each model posits distinct arguments regarding the association between race and class inequality and resource scarcity. The environmental racism model points to ideological-turned-institutional racism as the factor that undermines equality in the burdens, risks, and benefits of development such that neighborhoods of color in general, and Black neighborhoods in particular, are perceived as dispensable and valueless. Thus, Black neighborhoods tend to be the top choice for burdens/risks and, in the current study, the last choice for development. Contrastingly, the economic inequality model points to rational economic processes that favor high-income neighborhoods over poorer neighborhoods such that low-income neighborhoods are seen as valueless. Thus, neighborhoods with lower median household income are the last choice for development. While I found support for the environmental racism model, support for the economic inequality model was not readily apparent. Results suggest that resource scarcity (measured as having no access to grocery stores, pharmacies, and/or greenspaces within 1 mile) in neighborhoods is not shaped by class alone. More poignantly, the interaction between race and class in the study suggests that even in neighborhoods with high economic appeal (i.e., higher median household income), that these neighborhoods are predominantly Black renders them valueless. That moderately Black neighborhoods were consistently not associated with co-occurrent resource scarcity further emphasizes how the predominance of Black people in neighborhoods (and the consequential “marking” of the neighborhood as a “Black neighborhood”) shapes processes of disinvestment and resource scarcity. Additionally, that median household income was associated with higher risk of being just a green desert or a food-green desert rather than being a co-occurring food, pharmacy, and greenspace desert speaks to the cushioning effects of class on inequality in a way that, when

combined with Blackness, disappears (Wilson, Thorpe, and LaVeist 2017). Further, the interaction analyses findings that show that higher income moderately and predominantly Black neighborhoods are also more likely to be MDAs than their low-income, moderate and predominantly Black counterparts are provocative. That somehow, collective upward mobility for Blacks in the form of racially homogenous, high income communities results in even more neighborhood resource deprivation speaks to the enduring effects of racial residential segregation (Massey and Tannen 2016). This is so much more poignant when recognizing that moderately Black neighborhoods had no association with multiple resource scarcity until the mediation of median household income. Figure 2 shows that lower income, moderately Black neighborhoods are actually *less* likely to be an MDA than neighborhoods with even less Black people—until the median household income increases. At higher income levels, the benefits for moderately Black neighborhoods disappear.

Prince George’s County and Fulton County (part of Atlanta), included in the sample, are both prime examples of the ways in which race and class interact in counterintuitive ways to disadvantage Black people in neighborhoods. The average median household income for neighborhoods in Prince George’s County is nearly \$81,000 (well above the sample mean of \$61,000), and neighborhoods are on average 63% Black. Despite this wealth, more than half of the neighborhoods in Prince George’s County are MDAs. The average median household income in Fulton County is \$67,000 and neighborhoods are over 47% Black on average. Despite having higher median household income than most counties in the sample, 40% of neighborhoods in this county are MDAs.

Main findings indicating a race effect and a null class effect not only further validate Bullard’s conception of environmental racism as a primary factor in environmental inequality, but

also speak to the stratification model/perspective popular in urban sociology. This perspective highlights the structural barriers (e.g., discriminatory behaviors and policies of banks, lenders, real estate agents, and urban planners) that deepen racial inequality beyond what economic models can explain and create racially-stratified neighborhoods throughout cities (Massey and Denton 1993; Ross and Yinger 2002). The findings regarding the class measure, median household income, were also observed with other common measures of class (e.g., households below Federal Poverty Level and unemployment rate), though education (persons with a bachelor's degree or higher) was inversely associated with resource scarcity. This education measure was also strongly correlated with median household income ($r=.758$), so percentage of persons with a bachelor's degree was not included in the model.

Limitations

Each of the desert measures are not without their limitations. The food desert measure is a measure of access to large grocery stores, supermarkets, and supercenters only. Recent literature on food access has shown that many residents in lower income neighborhoods also purchase groceries from small chain “dollar” stores as well as convenience stores, farmer's markets and smaller family-owned markets (Bukonya 2018; Ruelas et al 2012; Sharkey, Dean, and Nalty 2012). Thus, the measure for food deserts might overestimate resource scarcity in terms of food. Moreover, the study does not measure access to fast food or casual dining restaurants, though research has shown that many low-income areas that lack access to grocery stores are often “food swamps” (i.e., they have several sources of less healthy food destinations such as fast-food restaurants) (Kwate 2008; Hager, Cockerham and O'Reilly 2017).

The green desert measure is a measure of access to public use parks, playgrounds, and walking trails only. The measure excludes private parks as well as zoological parks and other green

spaces not designated for public use. Thus, the measure may also underestimate individual access to green space in a more general sense. However, research on the role and value of urban green space has demonstrated that many spaces in neighborhoods with the potential for use are underutilized unless they are “designated” spaces (Swanwick, Dunnett and Woolley 2003). Thus, many of the open green spaces excluded in the green desert measure may not be utilized by residents.

Taken together, limitations in the desert measures may overestimate resource scarcity measures in general and the MDA measure specifically. However, lack of access may be apparent even in neighborhoods not objectively designated as deserted. Research suggests that, even in formerly low-income, gentrifying neighborhoods with newly sited supermarkets, older, poorer residents continue to lack access to food via these “food mirages” that imbue symbolic boundaries that alienate them (Sullivan 2014). Moreover, though the existence and implications of multiply-deserted areas are important in understanding food access among marginalized groups, it is important to note the ways that residents in low access neighborhoods cope with resource scarcity. Work by Reese (2018) on the Black food geographies of self-reliance emphasizes how Black communities create their own food sources in the face of structural, spatial inequality.

A key feature of this study is that it focuses on Black residents in urban neighborhoods. This focus is intentional, as the scope of the study is both theoretically and empirically grounded in the continued Black-white demographic binary in urban cities in the southern U.S. Although there have been increases in the population of Latinx and Asian people in the southern U.S. in the last thirty years, this influx is not represented in census data, perhaps because of issues in census data collection as well as a tendency for some populations to settle in more rural areas of the southern U.S. Thus, even if the present study sought to explore other racial demographics, the

available data denote that “predominantly Hispanic” or “predominantly Asian” neighborhoods do not exist in this sample of urban neighborhoods.

CONCLUSION

Despite these limitations, the current study contributes knowledge about the relationship between inequality and the physical and built environment and further demonstrates that race and racism shape disadvantage for marginalized individuals in more complex and insidious ways than demonstrated thus far. The findings have implications for policy-level and community interventions to remedy disparities in access to material resources. While there have been efforts to increase food access *or* greenspace for low-income, minority neighborhoods via farmer’s markets and community gardens, understanding that these neighborhoods are experiencing compounded, co-occurring resource scarcity calls for a more comprehensive policy intervention or community initiative that seeks to increase access to healthy foods, greenspace, and prescription medicines. Additionally, the study findings that suggest that higher income Blacks experience lack of access to three important health-related resources provide further insights on why wealthier Blacks do not receive the same benefits of the health-wealth gradient as their non-Black counterparts (Williams and Collins 2016; Wilson, Thorpe, and LaVeist 2017). Moreover, this finding highlights an additional route through which racism hinders the ability of Blacks to translate their socioeconomic resources into better health by shaping neighborhood contexts. Further, the study findings demonstrate that policy interventions should not only target low-income Black neighborhoods, but also higher income Black neighborhoods.

The study also provides theoretical and empirical contributions. First, the study contributes the term *multiply-deserted area* (MDA), a conceptualization of neighborhoods as sites of co-occurring resource scarcity. Examining neighborhoods as simultaneously experiencing various

types of deprivation broadens how research on neighborhood-level inequality is conducted. The present study also contributes knowledge on resource inequality and access in urban cities in the *southern* United States. An examination of the patterns of resource inequality in southern, urban neighborhoods highlights contextual policy interventions that can uniquely address inequality in the urban South in ways that urban policies crafted around the northeastern or midwestern urban ideal cannot. Moreover, this focus on southern, urban contexts echoes current research by Riley (2020) on racial hierarchy as a system of exposure that shifts across geography and/or time and thus exposes individuals to varying levels of the effects of racism that shapes inequality across national, state, or local settings.

Some of the criticisms of the desert literature in general and the quantitative research in this area in particular is that little is known about the quality of resources in neighborhoods and/or residents' perceptions of their access to resources despite what objective measures of this access may indicate. These critiques are valid. Future research should explore these issues of objective versus subjective access and alternative resource destinations in neighborhoods through qualitative analysis, including interviews with neighborhood residents. Notably, inequality in spatial access to resources disadvantages other racial minorities, including Latinx populations (Ortega et al 2016), and resource scarcity is pervasive across rural America (Morton and Blanchard 2007). Future research should examine the complex and unique patterns of resource scarcity across various marginalized social locations as well as over time. Lastly, making direct, empirical connections between this resource scarcity and health outcomes at the neighborhood-level should be next steps in this area of scholarship.

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Table 1: Descriptive Sample Characteristics (N=3011)

	Proportion
Dependent Measures	
<i>Resource Scarcity</i>	
MDA	.31
High (3 types)	.10
Food, Pharmacy, and Green	.10
Med (2 types)	.21
Food & Green	.06
Food & Pharmacy	.08
Pharmacy & Green	.07
Low (1 type)	.27
Food only	.14
Pharmacy Only	.03
Green Only	.10
No	.42

Source: USDA Food Access Research Atlas (Economic Research Service (ERS) USDA 2015); National Plan and Provider Enumeration System (NPPES); Various U.S. parks and recreations websites.

Table 2: Descriptive Sample Characteristics (N=3011)

	Mean	SD	Range
Independent Measures			
<i>Race</i>			
Percent Black NH	36.77	31.91	0-100
Marginally Black NH	.59	---	---
Moderately Black NH	.18	---	---
Predominantly Black NH	.23	---	---
<i>Class</i>			
Median Household Income (in \$10,000s)	6.11	3.34	.92-25
Controls			
Percent Foreign Born	14.65	13.33	0-68.44
Percent Owner-Occupied	55.64	23.89	0-100
Percent Walking Commuters	2.64	6.09	0-100
Percent HH w/ No Vehicle	10.68	11.65	0-84.6
Area (sq. miles)	3.08	9.40	.03-183.04
Population Density	5018.3	5652.2	3.3-66344.4
Opportunity Zone	.11	---	---

Source: American Community Survey (ACS) (2013-2017 5-year estimates)

NH=Non-Hispanic

HH=Households

Marginal= 0-36.6% Black

Moderate= 36.7-66.6% Black

Table 3. Binary Logistic Regression of Multiple Resource Scarcity (N=3011)

	Model 1	Model 2	Model 3	Model 4
Independent Measures				
<i>Race</i>				
Moderately Black NH	1.207		1.249	.505*
Predominantly Black NH	2.786***		2.913***	1.424
<i>Class</i>				
Median Household Income (in \$10,000s)		1.008	1.031	1.009
<i>Race * Class</i>				
Moderately Black NH				1.165**
Predominantly Black NH				1.132**
Controls				
Percent Foreign Born	1.013**	1.003	1.014**	1.011*
Percent Owner-Occupied	1.006*	1.006	1.004	1.003
Percent Walking Commuters	.984	.966*	.981	.978
Percent HH w/ No Vehicle	.959***	.982*	.962***	.970***
Area	1.156***	1.151***	1.158***	1.154***
Population Density	1.000***	1.000***	1.000***	1.000***
Is an Opportunity Zone	.635*	.799	.634*	.646*

Odds ratios

a. The base *Race* category for Models 1, 3, and 4 is Marginally Black Non-Hispanic (<36.77% Black)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

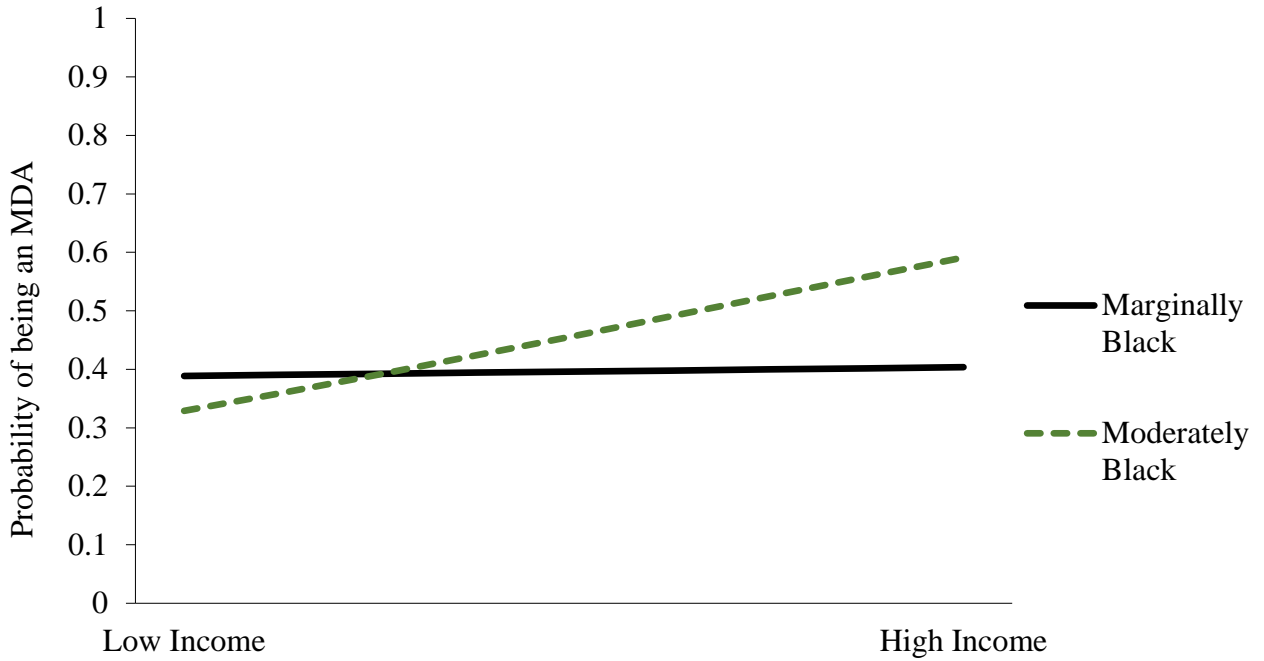


Figure 2. Interaction Effects of Race and Class on Multiple Resource Scarcity

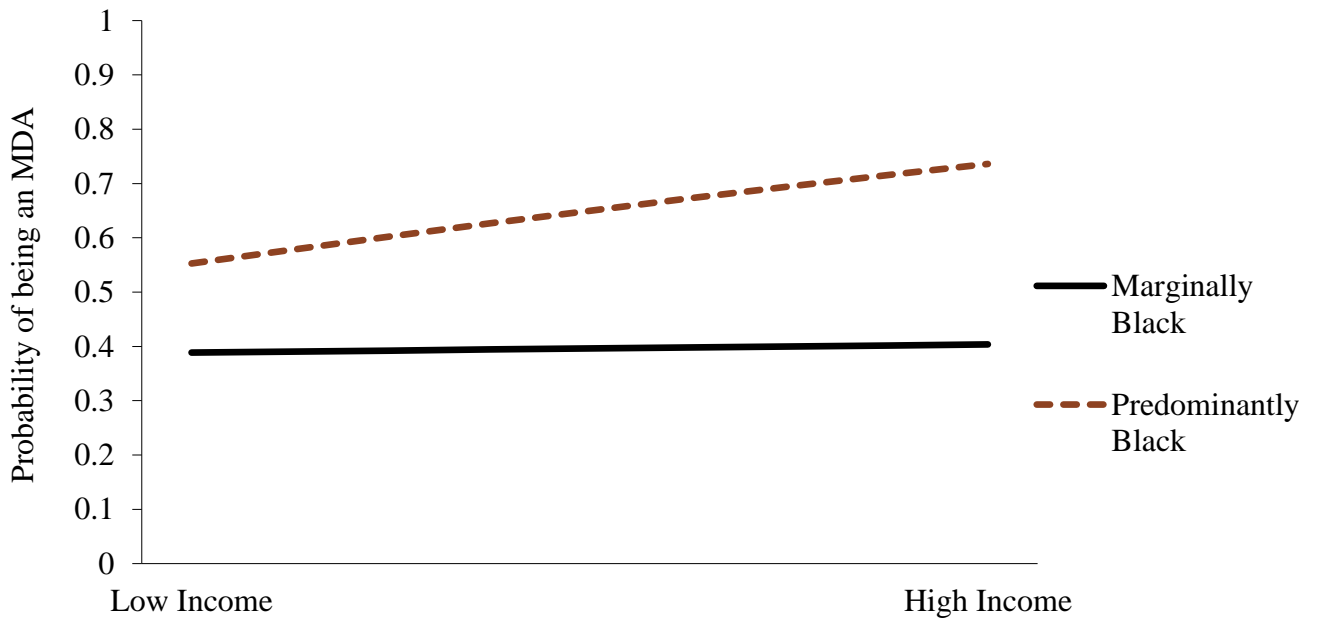


Table 4: Multinomial Logistic Regression of Type of Resource Scarcity (N=3011)- Collective Effects of Race and Class^a

	Not a Desert	Food only	Pharmacy only	Green Only	F-G	F-P	P-G
Independent Measures							
<i>Race</i>							
Moderately Black NH	.554***	.796***	.434***	.618***	.878***	.729***	.399***
Predominantly Black	.167***	.259***	.375***	.386***	.321***	.953***	.463***
<i>Class</i>							
Median Household Income (in \$10,000s)	.977	.941**	.872***	1.042*	1.073**	.941*	.934*
<i>Controls</i>							
Percent Foreign Born	.984*	.972***	.984	.972***	.960***	.990	1.007
Percent Owner-Occupied	.996	.999	.992*	.973***	.984***	1.003	1.000
Percent Walking Commuters	1.076***	1.087***	1.055*	1.070***	1.095***	.961	1.021
Percent HH w/ no Vehicle Area	1.093***	1.072***	1.070***	1.039**	1.044**	1.063***	1.042**
Population Density	.487***	.894***	1.024	.748***	.916***	.945**	1.099***
Is an Opportunity Zone	1.000***	1.000***	1.000***	1.000***	1.000	1.000	1.000***
	2.144***	1.347***	2.001***	1.660***	.841***	1.298***	1.212***

Relative risk ratios for collective effects of independent variables

* p < 0.05, ** p < 0.01, *** p < 0.001

^a The base category for each of these models is food, pharmacy, and green desert.

F-G= Food-Green desert; F-P= Food-Pharmacy desert; P-G= Pharmacy-Green desert

Table 5: Ordinal Logistic Regression of Compounded Resource Scarcity (N=3011)

	Model 1	Model 2	Model 3	Model 4
Independent Measures				
<i>Race</i>				
Moderately Black NH	1.254*	---	1.305*	.754
Predominantly Black NH	2.549***	---	2.698***	1.450
<i>Class</i>				
Median Household Income (in \$10,000s)	---	1.012	1.037*	1.020
<i>Race * Class</i>				
Moderately Black NH				1.099*
Predominantly Black NH				1.126**
Controls				
Percent Foreign Born	1.000	.991**	1.000	.999
Percent Owner-Occupied	1.001	1.000	.998	.998
Percent Walking Commuters	.996	.982	.996	.994
Percent HH w/ no Vehicle	.960***	.978***	.962***	.967***
Area	1.249***	1.243***	1.248***	1.244***
Population Density	1.000***	1.000***	1.000***	1.000***
Is an Opportunity Zone	.665**	.809	.665**	.682*

Proportional odds ratios

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

APPENDIX

Table 6. List of Counties (N=17)

County	Largest City
Berkeley County, WV	Martinsburg
Broward County, FL	Ft. Lauderdale
Dallas County, TX	Dallas
East Baton Rouge Parish, LA	Baton Rouge
Fulton County, GA	Atlanta
Hinds County, MS	Jackson
Jefferson County, AL	Birmingham
Jefferson County, KY	Louisville
Mecklenburg County, NC	Charlotte
New Castle County, DE	Wilmington
Prince George's County, MD	Upper Marlboro
Pulaski County, AR	Little Rock
Richland County, SC	Columbia
Richmond, VA*	Richmond
Shelby County, TN	Memphis
Tulsa County, OK	Tulsa
Washington, DC*	Washington

*Independent City

CHAPTER III

Deserts & Health: Examining Race, Neighborhood-level Resource Scarcity and Health in the Urban South

INTRODUCTION

Scholars studying the contextual effects of health have long considered the ways that neighborhood and community impact health, independent of individual factors such as income, education, and occupation. The urban living environment in particular has been the focus of neighborhood effects research, and neighborhood-level factors such as neighborhood disorder, crime, social integration, and social support networks have been associated with various mental and physical health outcomes (Carpiano 2007; Diez Roux and Mair 2010; Erving and Hills 2019; Leventhal and Brooks-Gunn 2003). Other research examining neighborhood-level effects on health has focused on both material and environmental resources, such as food (e.g., supermarkets, groceries, restaurants), healthcare resources (e.g., health providers, clinics, and pharmacies), and public recreational space (e.g., recreation/community centers, parks, and walking trails). These factors have been connected to various outcomes of health and well-being and reveal yet another route through which neighborhood contexts influence health (Coombes, Jones and Hillsdon 2010; Syed et al 2016; Babey et al 2008).

To date, most neighborhood and health research has focused on health effects of singular neighborhood factors (e.g., disorder, crime, or social support), resources (e.g., greenspace or supermarkets) or ecological burdens (e.g., pollution or noise). However, there is a need for a more comprehensive examination of how multiple neighborhood-level factors concurrently affect individual health. Drawing from medical sociology, urban geography, and environmental justice literatures, this paper examines the relationship between neighborhood-level resource scarcity and

health. Specifically, the current study fills gaps in knowledge on spatial inequality and health by examining whether multiply-deserted (i.e., having some combination of scarce food, greenspace, and/or pharmacy resources) urban neighborhoods have higher prevalence of negative health outcomes relative to non-desert and singly-deserted neighborhoods.

BACKGROUND AND THEORY

Neighborhood Effects & Disadvantage

Sociologists have defined neighborhoods as spatially-demarcated ecological units within larger communities, often influenced by political, ecological, and cultural forces (Du Bois 1903; Sampson et al 2002; Suttles 1972). In practice, most neighborhood studies utilize U.S. Census-defined geographic boundaries (e.g., block groups, census tracts, zip code areas) as proxies for neighborhoods (Sampson et al 2002). The neighborhood effects literature can be characterized as research examining neighborhood social processes, neighborhood-related mechanisms, and health-related outcomes. While much of the earlier literature on neighborhood effects has focused on the consequences of concentrated poverty (Diez Roux 2001; Gephart 1997; Sampson et al 2002), more recent work has examined other neighborhood-level characteristics such as social cohesion, neighborhood ties, social control, mutual trust, neighborhood disorder, and institutional resources. Studies examining the effects of these social-interactional and institutional characteristics have shown associations between these mechanisms and a variety of phenomena, including crime, police violence, depression, risky behavior, and physical health outcomes (Arnio 2019; Gapen et al 2011; Lippert 2016). Other structural and social mechanisms through which neighborhoods affect individual health are social networks, collective efficacy, institutional resources, and the physical environment (Arcaya et al 2016; Kravitz-Wirtz 2016; Erving and Hills

2019). Taken together, this area of research demonstrates that the collective characteristics of neighborhoods have the capacity to affect individual health and health-risk behaviors.

Neighborhood disadvantage literature takes an ecological approach to examining how the neighborhood context influences individual health. Disadvantaged neighborhoods are characterized by limited access to health care, quality schools, transportation, communication resources, employment opportunities, or employment networks (Ross and Mirowsky 2001; Haines, Beggs, and Hurlbert 2011). Recent research has focused on why such neighborhoods produce poor health outcomes in its residents, and some of the most commonly studied factors include neighborhood disorder, collective efficacy, and social control (Becker 2019; Cohen et al 2006). Scholars have characterized and classified neighborhood-level deprivation and disadvantage via socioeconomic contexts in various ways (e.g., percent households in receipt of public assistance; percent Black/African American, percent female-headed households, percent households at or below the federal poverty line (FPL)). Here, I focus on resource scarcity as a measure of neighborhood disadvantage as expressed through the concept of multiply-deserted areas (MDAs). This operationalization of neighborhood disadvantage contributes to the literature by providing a measure of resource scarcity that considers the cumulative nature of neighborhood resource deprivation. Additionally, this conceptualization considers how the built environment shapes individual health particularly among marginalized groups (Lovasi et al 2009). The environmental justice literature conceptualizes the physical environment in particular as a structural factor that is *shaped by* racism and classism and shapes health inequality. Thus, taking an environmental justice approach, I focus on material resources in the built environment. Though the mechanisms posited by scholars in the aforementioned literature are significant drivers of

health, I conceptualize lack of access to material resources in the built environment as an environmental justice issue that is consequential for health.

Resource Scarcity and Health

Food deserts. Research on food access and neighborhoods with no or poor access to healthy food destinations (i.e., food deserts) often examines the relationship between access to food destinations such as supermarkets, groceries, and community gardens and health-related outcomes such as eating behaviors, dietary intake, and obesity (Walker, Keane, and Burke 2010). Compared with other food stores, supermarkets tend to offer a larger variety of high-quality healthful foods at lower cost (Block and Kouba 2006; Bodor et al 2008; Chung and Myers 1999). Moreover, studies using in-store observations have shown vast differences in availability and higher quality of fresh produce, low-fat dairy products and snacks, lean meats, and high-fiber bread across various food destinations and neighborhoods (Hosler et al 2006; Morland and Filomena 2007; Zenk et al. 2006). Additionally, research by Lopez (2007) and Rose and Richards (2004) demonstrates the link between access to supermarkets and diet.

While some research has found no significant relationship between food deserts and health-related outcomes such as body mass index (BMI) and obesity (Budzynska et al 2013), other studies report that limited or no grocery store access is associated with increases in BMI, obesity prevalence, and chronic disease risk (Lopez 2007; Mari Gallagher Research & Consulting Group 2006; Morland, Wing and Roux 2002). Further, Salois (2012) examines the relationship between local food environment (farmer's markets and farms with direct sales) and prevalence of obesity and diabetes across U.S. counties and finds that counties with stronger local food economies have lower obesity and diabetes prevalence. Taken together, this area of research suggests that access to food in general, and healthy food in particular, is consequential for health.

Pharmacy deserts. The prevalence of pharmacies and other sources of prescription medications and its association with health outcomes is understudied in health research, as much of the literature examining neighborhood-level health-related resources focuses on access to healthcare providers and health insurance (Dosen et al 2017; Gaskin et al 2012; Hoffman and Paradise 2008; Wang and Luo 2005). Despite modest growth of U.S. pharmacies in the last two decades, the availability of pharmacies and pharmacy characteristics associated with access to prescription medications vary substantially across local areas (Qato et al 2017). A recent study by Qato et al (2014) examining access to pharmacies across Chicago neighborhoods found that pharmacy deserts were more prevalent in neighborhoods with high concentration of Blacks compared to neighborhoods with a high concentration of whites or more racially heterogeneous neighborhoods. Similarly, Chisholm-Burns et al (2017) found that, across Shelby County, TN (Memphis), areas with fewer pharmacies had higher percentages of racial and ethnic minorities. Moreover, Amstislavski and colleagues (2012) found that poorer urban communities had less geographic access to pharmacies than middle-class and low poverty urban neighborhoods. Additionally, pharmacies in poorer communities had limited to no availability of commonly prescribed medications.

Despite some demonstrated patterns of inequality in pharmacy access, there is a dearth of research on how this factor *shapes* health and health behaviors. One such study, Syed et al. (2016), found no significant association between distance to pharmacies and medication adherence among diabetic Medicaid recipients in urban neighborhoods. Nevertheless, more research is needed to better understand whether pharmacy deserts influence other health outcomes (beyond medication adherence), and whether this association extends to a broader population of neighborhood residents (i.e., beyond Medicaid recipients with diabetes).

Green deserts. Areas lacking recreational green space (i.e., parks, walking trails), otherwise known as greenspace/green deserts, are a hot topic across social science disciplines. Within public health, environmental psychology, and medical sociology, greenspace has been studied in terms of its direct and indirect physical and mental health benefits and its relationship to exercise and recreational physical activity. One study found that living in a “green” environment was positively related to self-reported general health (De Vries et al. 2003); furthermore, this association was stronger for lower SES residents. Jennings, Larson, and Yun (2016) find that urban green spaces provide a variety of ecosystem services (e.g., water and air pollution regulation, mitigation of urban heat effects, and access to fruits and vegetables) that support physical, psychological, and social health as well as provide spiritual and cultural value. Additionally, recent studies have linked a lack of access to parks with obesity (Cutts et al 2009; Lachowycz and Jones 2011; Wolch et al 2011).

Despite research having yet to pinpoint how much of a “nature dose” is needed for differential health benefits (Shanahan et al 2015), the sum of current research on greenspace and health indicates some positive associations. Lachowycz and Jones (2013) develop a framework that highlights how use of greenspace as well as perceptions of the living environment mediate the relationship between greenspace and both psychological and physical health outcomes. Moreover, Lachowycz and Jones (2013) assert that this association varies according to ethnicity, gender, and socioeconomic status as well as other contextual factors including climate, greenspace type, and living contexts. Honold et al (2012) examine urban environmental burdens (e.g., traffic noise, air pollution) and find that lack of vegetation is associated with higher appraisals of these burdens as stressful, less neighborhood satisfaction, and poor health behaviors. However, general health ratings did not vary according to more or less burdened neighborhoods. As research on greenspaces

and health increases, we might better be able to articulate the nuanced nature of this association. Moreover, by examining green deserts in combination with other desert types, we can uncover a more contextualized view of green deserts which may tend to co-occur with other forms of resource scarcity. This is especially important as a review of research on the effects of the built environment on obesity by Lovasi et al (2009) shows that superstores and places to exercise were consequential for obesity, especially among disadvantaged groups.

Theoretical Framework & Hypotheses

In the medical sociological literature, stress theory has become a central theoretical framework for conceptualizing status differences in health as well as variations in the risk and protective factors associated with such differences. A central premise of the stress process is that social statuses determine the conditions of people's lives, such conditions create the context for differential exposure to stressful events and coping resources, and differences in health conditions arise from variations in stress exposure and resource accumulation (Pearlin 1983, 1989; Pearlin et al. 1981). A *stressor* refers to any environmental, social, or internal demand which requires an individual to readjust their usual behavior and strains their coping strategies (Holmes and Rahe 1967; Thoits 1995). Stress process theory asserts that stressors initiate efforts to cope with not only behavioral demands but also with the emotional reactions that are usually evoked by them. As these stressors accumulate, an individual's ability to cope and/or readjust to these stresses may be limited, resulting in a depletion of their physical and/or psychological resources. This increases the likelihood of the manifestation of this depletion through deteriorating health. Because of our understanding of systems of stratification in the U.S., inequality based on race and SES translates into tangible inequality in the distribution of resources and opportunities. This material deprivation can be a source of stress.

Empirical research on socioeconomic and racial disparities in stress exposure are important to consider in an examination of material deprivation as a stressor, as Pearlin (1989) argues that most sources of stress are manifestations of social stratification. Although most people experience stress from relationships, work, or financial crises, people with limited economic resources or social disadvantage face greater exposure to stress over the life course (Taylor and Seeman 1999; Thoits 1995). Relative to their white counterparts, Blacks experience higher levels of stress exposure (Sternthal, Slopen, and Williams 2011; Turner and Avison 2003). Thus, differential exposure to stressors and the ensuing adverse biological effects of chronic stress would likely accumulate more among Black, lower SES neighborhoods.

In the current study, I conceptualize living in a multiply-deserted area (MDA) as a factor that is two-fold in its adverse effects on health. Not only does lack of access to material resources (e.g., healthy food, medicines, and greenspace) directly shape health outcomes and health behaviors, but it is in and of itself a stressor that *indirectly* impacts health. This stressor represents a daily, relatively continuous problem (i.e., chronic strain) faced by residents in these areas. Especially for those with limited access to a working vehicle, figuring out how to get to healthy food destinations or pharmacies may be stress-inducing. The lack of access to active greenspace (parks) to ameliorate this access-related stress or other stressors may exacerbate strain. Though lack of access to food, pharmacies, or greenspace may be a stressor to anyone, the larger sociological context of social, economic, and political disinvestment in poor, Black neighborhoods disproportionately burdens these neighborhoods. Additionally, the race-class parallels that situate persons of color in the lowest SES quintiles relative to their white counterparts implicates a greater negative impact of lack of access for low-income Black individuals, as both Blackness and poorness shape health and well-being beyond neighborhood access. Living in an MDA may also be a stressor via

internalized stigma, as research shows that residents of environmentally-degraded and otherwise deprived neighborhoods still form emotional attachments to their neighborhoods (Leslie and Cerin 2008; Miller and Townsend 2005).

Though much of the stress literature focuses on a specific micro-level stressor (e.g., experiencing financial strain, perceived discrimination), the MDA is a contextual meso-level stressor that can potentially affect all neighborhood residents (Wheaton and Montazer 2017). Aneshensel (2010) has noted the under-emphasis of contextual factors, especially neighborhood-level characteristics, in the broader stress literature. Moreover, Williams (2018) emphasizes increased attention to effects of institutional racism (e.g., racial residential segregation) that create stress-inducing neighborhood environments, including a lack of open green spaces. Another feature of this conceptualization of MDAs as a unique stressor is its focus on both the specific combinations of and the co-occurrence of multiple types of resource scarcity. As opposed to focusing on neighborhoods existing as one type of desert, an MDA is a measure of co-occurring resource scarcity (i.e., a neighborhood that is a desert of more than one type) and thus compounded stressors. Past research on discrimination stress shows that reporting multiple forms of discrimination is associated with worse health relative to experiencing one form of discrimination (Grollman 2012, 2014, 2017). Similarly, here I propose that living in an MDA will be associated with worse health than living in a single-resource desert. As opposed to focusing on micro-level perceived discrimination, here I test the stress accumulation hypothesis using a meso-level, ecological assessment of stress.

Research on resource scarcity in the urban South demonstrates that predominantly Black neighborhoods are more than twice as likely to be MDAs, even after controlling for median household income (See Chapter Two). Further, predominantly Black neighborhoods with higher

median household income are 11% more likely to be MDAs than their non-predominantly Black, high income counterparts (See Chapter Two). Thus, social stress theory in conjunction with current literature on deserts and health lend themselves to an analysis of how compounded, multiple disadvantages in the form of co-occurring resource scarcity might influence health. A survey of these literatures suggests that health outcomes for residents of MDAs will be worse than those for residents in neighborhoods that have more resources. Additionally, race and class may shape how resource scarcity affects health. Thus, this study addresses the following research questions:

What is the relationship between neighborhood-level resource scarcity and physical health?

How does the relationship between neighborhood-level resource scarcity and physical health vary according to race and class composition of neighborhoods?

To fill empirical gaps in our knowledge of the desert-health interaction, this study focuses on urban neighborhoods in the southern U.S., an understudied geography in urban studies literature. The current study's application of the stress process model suggests the following:

H1: Neighborhoods with resource scarcity of two or more types (i.e., multiply-deserted areas) will have higher prevalence of negative health outcomes than neighborhoods with no resource scarcity or only one type of resource scarcity.

H2: Increases in median household income across neighborhoods with resource scarcity of two or more types (i.e., multiply-deserted areas) will be associated with decreases in prevalence of negative health outcomes.

H3: Neighborhoods with resource scarcity of two or more types (i.e., multiply-deserted areas) that are predominantly Black will have higher prevalence of negative health outcomes than non-predominantly Black MDA neighborhoods.

DATA AND METHODS

Data and Sample

This study focuses on the urban South. I define the South using the specifications of the U.S. Census Bureau. I selected all populated census tracts in Hinds County, Mississippi; Mecklenburg County, North Carolina; Richland County, South Carolina; Washington, District of Columbia, Dallas County, Texas; Tulsa County, Oklahoma; Jefferson County, Alabama; Jefferson County, Kentucky; Broward County, Florida; Fulton County, Georgia; New Castle County, Delaware; Pulaski County, Arkansas; and Shelby County, Tennessee. Each county included in the sample from each state was chosen based on which county was the most densely populated, had a racial composition greater than 50% nonwhite when applicable or more racial heterogeneity when nonwhite populations in either county were not less than 50%, had a higher percentage of the population at or below federal poverty level (FPL), and had a relatively lower median household income. Each of these demographic factors are critical for the study's focus on the urban environment (Robinson 2014; Sharma 2017). Thus, counties in the final sample most exemplified "urban" in southern U.S. contexts.

Census tracts are routinely used as proxies for neighborhoods as they are a good approximation of a neighborhood environment and are designed to be relatively permanent over time (U.S. Census Bureau n.d.). Census tracts include approximately 4,000 people, and boundaries are delineated to encompass a relatively demographically and economically homogenous population. In addition, census tracts adhere to visible geographic boundaries (Foster and Hipp 2011; U.S. Census Bureau 2018). Census tracts were matched with available census-tract level health outcome data, and census tracts without matching health outcome data available (n= 866) were excluded. The final sample was 2,145 census tracts (N=2145).

Dependent Measures

There are four measures of health and health-related outcomes. Health outcome data was obtained from the 2019 release of the 500 Cities: Local Data for Better Health dataset (CDC 2019). Health data from 500 Cities is ideal for this study, as it includes census-tract level health outcome and health-risk behavior prevalence data for the nation's largest cities. The following three (3) health outcome measures are included: diagnosed diabetes among adults aged ≥ 18 years; current asthma among adults aged ≥ 18 years; and obesity among adults ages ≥ 18 years. I also include one (1) health risk behavior as a dependent measure: no leisure-time physical activity among adults aged ≥ 18 years. This measure is included as an outcome rather than a control, as physical activity has been directly linked to access to greenspaces such as parks and walking trails (Cohen et al 2007).

Independent Measures

The key independent variable is resource scarcity via multiply-deserted areas. The food, pharmacy, and greenspace deserts measures as well as the MDA measure are described in Chapter Two. I also construct a nuanced measure of co-occurring resource scarcity. Census tracts were coded according to whether resource scarcity was co-occurring (food-green-pharmacy desert or food-pharmacy or food-green or pharmacy-green), singly occurring (food only, green only, pharmacy only), or not occurring. This variable measures resource scarcity in a heterogenous, cumulative sense (0, 1, 2/3).

Other Covariates/Controls

Race and class are the key covariates in the study. Both measures were obtained from 2014-2018 5-year estimates of the American Community Survey (ACS) census data for each census tract in each county. The race/ethnicity measure was constructed using the percent Black alone variable ($M=37.26$, $SD=32.56$). Neighborhoods were dichotomously coded on whether they were

predominantly Black non-Hispanic or not. I calculate this measure of predominance as greater than or equal to one standard deviation above the mean percent Black residents (i.e., 69.8). The class measure is the median household income within a census tract.

I also include several controls. First, a *disability* measure (percentage of individuals in each census tract with any kind of disability as defined by the ACS). Disability was included because health-related behavior such as medication adherence might be impacted by physical ability to drive or walk to pharmacies. I include a *mobility* measure (percentage of employed individuals that walked to work) as an indirect measure of access to public or personal transportation on a regular basis, as transportation access can be a barrier to various facets of healthcare (i.e., providers, pharmacies) (Syed et al 2013). Additionally, this measure is one of the only measures of physical activity available in the ACS data. However, because walking to work might also be a convenience and marker of privilege in some neighborhoods, I also include the *percentage of households with no vehicle* to measure access to personal transportation. I also include an *age* measure using ACS data that included the percentage of older adults (≥ 65 years) in each census tract; a measure of *insurance coverage* that included the percentage of individuals without health insurance; and *nativity status* (percent foreign born). Lastly, I control for neighborhood economic potential via federal designation as an *opportunity zone*.

Analysis

I provide descriptive statistics for key dependent and independent variables in Table 1. I use ordinary least squares regression to test the main hypotheses using the binary MDA measure (Tables 2 and 3) and the ordinal resource scarcity co-occurrence measure (Table 4). Results are reported as beta coefficients. Geocoding and spatial analysis are conducted in ArcGISPro, and all other statistical analyses are conducted in R.

RESULTS

Descriptive Statistics

Table 1 provides descriptive statistics for the dependent and independent measures. Dependent measures are mean prevalence rates of health and behavior outcomes at the census tract level. The mean prevalence of asthma is 10.01 percent (SD=1.85); mean prevalence of obesity is 33.28 percent (SD=8.36); mean prevalence of diabetes is 11.77 (SD=4.86); and mean prevalence of inactivity is 31.39 (SD=9.15).

One-fourth (.25) of the neighborhoods in the sample are MDAs (n=530), while over half (.51) are at least one kind of resource desert (n=1088). Single resource-scarce neighborhoods made up over a quarter of the sample (.26), and almost half of the sample were not resource scarce (.49). Black non-Hispanics make up 37.25 percent of residents in neighborhoods in the sample (SD=32.56), and nearly one-fourth (.23) of neighborhoods in the sample are predominantly Black (i.e., 69.8 percent or more). The average median household income is \$57,316 (SD= \$33,581). The mean percentage of foreign-born residents in each neighborhood is 14.15 (SD=12.67); mean percentage of residents who walk to work is 3.05 (SD=6.56), and the mean percentage of uninsured population is 12.9 (SD=8.42). The mean percentage of neighborhood residents with a disability is 12.67 (SD=6.36), and on average, 12.62 percent (SD=7.13) of neighborhood residents were 65 years of age or older. Additionally, the mean percentage of households without a vehicle is 12.39 (SD=12.74), and 12 percent of neighborhoods in the sample are federally-designated opportunity zones.

[Table 1 placed about here]

Health/Health Behavior Outcomes

Table 2 provides results of ordinary least squares regression for each of the health outcomes (asthma, obesity, diabetes, inactivity) in association with the binary MDA measure. Results indicate that MDAs are associated with higher prevalence of inactivity ($b=1.101$, $p<.001$), asthma ($b=.121$, $p<.01$), diabetes ($b=.485$, $p<.001$), and obesity ($b=.923$, $p<.001$) compared to neighborhoods that are not MDAs.

[Table 2 placed about here]

Table 3 shows the interaction effects of resource scarcity with race and class, respectively. The MDA-race statistical interaction is significant across all four health/health behavior outcomes: inactivity ($b=-1.500$, $p<.01$), asthma ($b=-.325$, $p<.01$), diabetes ($b=-.616$, $p<.05$), and obesity ($b=-1.589$, $p<.001$). Each interaction suggests that predominantly Black MDAs have higher prevalence of inactivity, asthma, obesity, and diabetes than non-predominantly Black MDAs. In addition, predominantly Black MDAs have lower prevalence of inactivity, diabetes asthma, and obesity than predominantly Black non-MDAs⁹. Non-predominantly Black MDAs have higher prevalence of all four health outcomes than non-predominantly Black nonMDAs. For ease of interpretation, Figures 1-4¹⁰ provide a graphical representation of the MDA-Predominantly Black interaction for inactivity, asthma, diabetes, and obesity.

⁹ Supplemental analyses reveal that the lower prevalence for predominantly Black MDAs relative to predominantly Black non-MDAs are apparent for middle- and high-income neighborhoods only. For low-income predominantly Black neighborhoods, prevalence is similar across MDA status.

¹⁰ See Appendix

The MDA-class statistical interaction is significant for inactivity ($b=.139, p<.05$), diabetes ($b=.084, p<.05$) and obesity ($b=.195, p<.001$). Plots of these interactions suggest that high income MDAs (i.e., 1 SD above the mean median household income, ~\$90,900) have lower prevalence of these health outcomes than low-income MDAs (i.e., 1 SD below the mean median household income; ~\$23,400). Although not shown, this pattern is also apparent for average/middle income neighborhoods (\$53,700). Prevalence in these MDAs is lower than that of low-income neighborhoods, but higher than that of high-income neighborhoods. For ease of interpretation, Figures 5-7¹¹ provide a graphical representation of the MDA-Median household income interaction for inactivity, diabetes, and obesity.

[Table 3 placed about here]

Table 4 provides results of the ordinary least squares regression for each of the health outcomes (asthma, obesity, diabetes, inactivity) in association with the ordinal resource scarcity co-occurrence measure (0-2). Results indicate that neighborhoods that are multiple resource deserts are associated with higher prevalence of inactivity ($b= 1.121, p<.001$), asthma ($b=.130, p<.01$), diabetes ($b=.53, p<.001$), and obesity ($b= 1.016, p<.001$) relative to neighborhoods with no resource scarcity. For all four outcomes, single resource scarcity was not associated with prevalence of these health outcomes relative to neighborhoods with no resource scarcity. This null finding suggests that multiple resource scarcity is more consequential for health than single resource scarcity.

¹¹ See Appendix

[Table 4 placed about here]

In sum, I find support for Hypotheses 1 and 3, and partial support for hypothesis 2. Specifically, MDAs have higher prevalence of all four health outcomes (asthma, obesity, diabetes, and inactivity) compared to non-MDAs (Hypothesis 1). Further, neighborhoods with multiple resource scarcity have higher prevalence of all four health/health behavior outcomes than neighborhoods with less resource scarcity (Hypothesis 1). Additionally, high income MDAs have lower inactivity, diabetes, and obesity prevalence compared to low-income MDAs (Hypothesis 2). Further, predominantly Black MDAs have higher prevalence of inactivity, asthma, obesity, and diabetes compared to non-predominantly Black MDAs (Hypothesis 3).

DISCUSSION

The present study examined the health effects of resource scarcity across urban neighborhoods in the southern U.S. Half of neighborhoods in urban cities in the southern U.S. have resource scarcity of at least one of the three types examined in the study (food, pharmacy, greenspace). More importantly, one-fourth of neighborhoods in urban cities in the southern U.S. are multiply-deserted areas, which signals that compounded, co-occurring resource scarcity is not an anomaly for the urban South. Guided by an environmental justice framework and stress theory, this multi-state study sought to determine how resource scarcity shapes health across neighborhoods and how race and class shape this relationship. Results suggest that MDAs have higher prevalence of asthma, diabetes, obesity, and inactivity compared to neighborhoods with low or no resource scarcity. Interestingly, MDAs where Black residents are an overwhelming majority have higher prevalence of inactivity, asthma, diabetes, and obesity relative to MDAs that are not predominantly Black.

Further, high income MDAs have relatively lower prevalence of obesity, diabetes, and inactivity than low-income MDAs.

Social stress theory is an appropriate perspective to apply to this study of the influence of compounded, co-occurring resource scarcity on health. Situating the co-occurring lack of access to healthy food destinations, pharmacies, and greenspace as a chronic strain highlights a novel way that neighborhood disadvantage is measured and is consequential for health. Findings that suggest that co-occurring resource scarcity negatively affects health relative to low or no resource scarcity help to support these ideas. In particular, that single resource scarcity had no effect on any of the health outcomes relative to no resource scarcity, but multiple resource scarcity influenced all four health outcomes supports the idea that *compounded* lack of access to health-related resources is 1) a greater source of stress and 2) has a greater direct impact on health than lack of access to only one health-related resource. Moreover, that food desert-only neighborhoods make up the largest proportion of resource scarce neighborhoods in general and single resource scarce neighborhoods in particular suggests that the substantial focus on the health effects of food destination scarcity in the deserts literature does not capture how lack of access to supermarkets ultimately shapes health *in conjunction* with other resource scarcity rather than by itself.

Further, the stress process model aids in underscoring how race and various forms of racism (beyond interpersonal) can result in cumulative stress that negatively affects health. Likewise, approaching this research from an environmental justice framework emphasizes how structural racism can shape access to resources in the built environment that also have a direct connection to health and well-being. Findings related to the interactions between race, class, and resource scarcity further demonstrate the complex ways in which race and class obfuscate how neighborhood-level resource scarcity shapes health for poor and/or Black neighborhoods. Across

MDAs, high income areas have lower prevalence of inactivity, diabetes, and obesity than low-income areas. However, the effect of resource scarcity on health appears greater for high income neighborhoods than low-income neighborhoods— the prevalence “gap” between low-income MDAs and non-MDAs is smaller than that of high-income MDAs and non-MDAs across all three health outcomes. This suggests that limited access to health-related resources might be relatively more detrimental for those in high-income neighborhoods. Alternatively, the various disadvantages that coincide with resource scarcity in low-income neighborhoods might shroud the independent effects of resource scarcity in these areas.

The continued significance of race in shaping health is reflected in the current study’s finding that predominantly Black MDAs have higher prevalence of inactivity, diabetes, asthma, and obesity compared to their non-predominantly Black MDA counterparts. Scholars who interrogate issues of environmental racism and racial capitalism grapple with similar contexts in which race and structural and institutional racism routinely disadvantage neighborhoods that are numerically (or perceived to be) predominantly Black (Bullard 1993; Robinson 2000). The effects of the systemic devaluation of Black lives and Black neighborhoods are far-reaching, beyond other social and economic determinants of health. This is particularly evident by the study’s MDA-race interaction effects, which demonstrates that the prevalence “gap” across predominantly Black neighborhoods is smaller relative to that of non-predominantly Black neighborhoods. Though resource scarcity impacts health (and is itself a manifestation of systemic racism), the independent effects of race and racism on health are significant (Williams, Lawrence, and Davis 2019).

Nevertheless, this study reveals variation in health patterns among predominantly Black neighborhoods. I find that predominantly Black, multiply-deserted neighborhoods have lower prevalence of health problems than their predominantly Black, non-MDA counterparts. That

residents in Black neighborhoods with compounded resource scarcity experience slightly better health than those in Black non-MDAs is difficult to account for. There may be other moderating factors that impact how race and resource scarcity interact to shape health. Findings related to interactions between class and resource scarcity might provide insights into this relationship. As such, further examinations of how race, resource scarcity and class interact *together* to shape health are needed.

Limitations

Each of the desert measures are not without their limitations. The food desert measure consists of access to large grocery stores, supermarkets, and supercenters only. Recent literature has shown that many residents in lower income neighborhoods also purchase groceries from small chain “dollar” stores as well as convenience stores, farmer’s markets, and smaller family-owned markets (Bukanya 2018; Reulas et al 2012; Sharkey, Dean, and Nalty 2012). Thus, the measure for food deserts might overestimate resource scarcity. Moreover, the study does not measure access to fast food or casual dining restaurants, though low-income areas that lack access to grocery stores are often “food swamps” (i.e., several sources of less healthy food destinations such as fast-food restaurants) (Hager, Cockerham and O’Reilly et al 2017; Rose et al 2009). Additionally, the pharmacy desert measure assesses access to independent and chain pharmacies-both stand alone as well as pharmacies *inside* supermarkets and grocery stores. Moreover, pharmacies in poorer communities have higher odds of medications being out of stock, so this measure may underestimate lack of access to prescriptions medicines (Amstislavski et al 2012).

The green desert measure captures access to public use parks, playgrounds, and walking trails only. The measure excludes private parks as well as zoological parks and other green spaces not designated for public use. Thus, individual access to green space may be underestimated.

However, research on the role and value of urban green space has demonstrated that many spaces in neighborhoods with the potential for use are underutilized unless they are “designated” spaces (Swanwick, Dunnett and Woolley 2003). Thus, open green spaces excluded in the green desert measure may not be utilized by residents. An examination of the *quality* of parks might be necessary to fully understand patterns of utilization and potential health benefits of access.

Taken together, limitations in the desert measures may overestimate resource scarcity measures in general and the multiply-deserted area measure specifically. However, lack of access may be apparent even in neighborhoods not objectively designated as deserted. Research suggests that, even in formerly low-income, gentrifying neighborhoods with newly sited supermarkets, older/poorer residents continue to lack access to food via these “food mirages” that imbue symbolic boundaries that alienate them (Sullivan 2014). Hence, the actual effects of a lack of access to these resources on health may be underestimated. Also, though the existence and implications of multiply-deserted areas are important in understanding food access among marginalized groups, it is important to note the ways that residents in low access neighborhoods cope with resource scarcity. While many residents have significant mobility barriers to access outside their neighborhood, residents in food deserts adapt by accessing food sufficiently outside their neighborhood as well as create their own food sovereignty via community gardens (Reese 2018; White et al 2004)

CONCLUSION

The current study contributes insights about the relationship between inequality in the built environment and health, further implicating racism in shaping disadvantage for marginalized individuals in complex, insidious ways. The findings have implications for policy-level and community interventions to remedy health disparities related to access to resources. While there

have been efforts to increase food access *or* greenspace for low-income, non-predominantly Black neighborhoods via farmer's markets and community gardens, understanding that these neighborhoods are experiencing compounded, co-occurring resource scarcity calls for a more comprehensive policy intervention or community initiative that increases access to healthy foods, greenspace, and prescription medicines. Moreover, while there have been policy efforts to reduce disparities in prescription access and adherence via expansion of Medicare Part D and Medicaid, the findings suggest that efforts to reduce disparities should also incorporate policies that increase spatial access to pharmacies. Moreover, these findings highlight an additional pathway through which racism hinders the ability of Blacks to translate their socioeconomic resources into better health by shaping neighborhood contexts.

The study also provides theoretical and empirical contributions. First, the study applies the stress process model in a novel and underutilized way by conceptualizing co-occurring resource scarcity as an accumulative chronic strain that shapes health and well-being. The study examines how *multiply-deserted areas*, or co-occurring resource scarcity, shapes physical health across four distinct health outcomes. The study goes further to demonstrate how race and class can shape how the strain of lack of access to resources influences health. Examining neighborhoods as simultaneously experiencing various types of deprivation broadens how research on neighborhood-level inequality is conducted. Likewise, examining how the neighborhood shapes health beyond traditional measures of neighborhood disadvantage is important for how scholars interested in "neighborhood effects" conceptualize disadvantage and neighborhood-level factors that may have an influence on health. Additionally, examining lack of access to material resources in the built environment as an environmental justice issue also broadens the scope of environmental justice research.

Lastly, in addition to contributing knowledge on resource inequality, access, and health in urban cities in the *southern* United States, the study lays groundwork for continued research in this area for other communities of color and older communities whose health may be uniquely impacted by resource scarcity. Future research should explore the varied effects of other types of resource scarcity (e.g., childcare, healthcare) on the health and well-being of other marginalized populations.

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Table 1: Descriptive Sample Characteristics (N=2145)

	M	SD	Range
Dependent Measures			
<i>Health Outcomes</i>			
Asthma	10.01	1.85	(6.3-16.2)
Obesity	33.28	8.36	(15.7-55.5)
Diabetes	11.77	4.86	(1.7-28.6)
Inactivity	31.39	9.15	(12.6-55.9)
Independent Measures			
<i>Resource Scarcity</i>			
MDA (2+ deserts)	.25	---	---
Desert (1+ deserts)	.51	---	---
<i>Compounded Resource Scarcity</i>			
No desert	.49	---	---
1 desert	.26	---	---
2+ deserts	.25	---	---
Covariates & Controls			
Percent Black NH	37.26	32.56	(0-100)
Predominantly Black NH	.23	---	---
Median household income (in \$10,000s)	5.73	3.36	(0.9-24.9)
Percent walking commute (to work)	3.05	6.56	
Percent Uninsured	12.9	8.42	(0-63.5)
Percent Foreign Born	14.16	12.67	(0-59.6)
Percent w/ a disability	12.67	6.36	(0-78.5)
Percent population 65+ years	12.72	7.13	(0-79.2)
Percent HH w/o a vehicle	12.39	12.74	(0-84.6)
Opportunity Zone	.12	---	---
Source: 500 Cities data, 2019 Release (CDC 2019); American Community Survey (ACS) (2017-year estimates); USDA Food Access Research Atlas (Economic Research Service (ERS) USDA 2015); National Plan and Provider Enumeration System (NPPES); Various U.S. parks and recreations websites			
NH=Non-Hispanic			
HH= households			

Table 2: OLS Regression of Multiple Resource Scarcity on Health Outcomes (N=2145)

	Inactivity	Asthma	Diabetes	Obesity
Independent measures				
<i>Resource Scarcity</i>				
MDA (2+ deserts)	1.101***	.121**	.485***	.923***
<i>Race</i>				
Predominantly Black NH	4.834***	1.315***	4.321***	4.940***
<i>Class</i>				
Median Household Income (in \$10,000s)	-.876***	-.183***	-.213***	-.686***
Controls				
Percent walking commuter	-.135***	-.017***	-.099***	-.178***
Percent Uninsured	.369***	.011**	.180***	.341***
Percent Foreign Born	.045**	-.031***	-.013*	-.148***
Percent w/ a disability	.391***	.056***	.204***	.291***
Percent 65+ years of age	-.045**	-.051***	.123***	-.190***
Percent HH w/o a vehicle	.043***	.023***	.033***	.018*
Opportunity Zone	.891**	.110	.485**	.724**
Beta coefficients				
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$				

Table 3. Interaction Effects of Race, Class, and Resource Scarcity on Health (N=2145)

	<u>Model 1</u>	<u>Model 2</u>
Inactivity		
<i>MDA*Race</i>	-1.500**	---
<i>MDA*Class</i>	---	.139*
Asthma		
	<u>Model 1</u>	<u>Model 2</u>
<i>MDA*Race</i>	-.325**	---
<i>MDA*Class</i>	---	.015
Diabetes		
	<u>Model 1</u>	<u>Model 2</u>
<i>MDA*Race</i>	-.616*	---
<i>MDA*Class</i>	---	.084*
Obesity		
	<u>Model 1</u>	<u>Model 2</u>
<i>MDA*Race</i>	-1.589***	---
<i>MDA*Class</i>	---	.195***

Note: Coefficients are shown in the table. All models control for all covariates in the full models (Table 2)

MDA=Multiply-deserted areas (2+ types); *Race* variable is binary predominantly Black measure; *Class* variable is median household income

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Ordinary Least Squares Regression of Co-Occurring Resource Scarcity on Health Outcomes (N=2145)

	Inactivity	Asthma	Diabetes	Obesity
Independent measures				
<i>Resource Scarcity</i>				
Desert (1 desert type)	.050	.023	.112	.231
Multiply Deserted (2+ desert types)	1.121***	.130**	.531***	1.016***
<i>Race</i>				
Predominantly Black NH	4.833***	1.314***	4.318***	4.934***
<i>Class</i>				
Median Household Income (in \$10,000s)	-.875***	-.182***	-.212***	-.684***
Controls				
Percent walking commute	-.135***	-.017***	-.099***	-.178***
Percent Uninsured	.369***	.011**	.180***	.341***
Percent Foreign Born	.045***	-.031***	-.012*	-.146***
Percent w/ a disability	.391***	.055***	.204***	.291***
Percent 65+ years of age	-.135**	-.051***	.122***	-.190***
Percent HH w/o a vehicle	.044***	.023***	.034***	.020*
Opportunity Zone	.892**	.110	.487**	.728**

Beta coefficients

The comparison group is no desert (0); neighborhoods that are neither food, pharmacy, nor green space deserts.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

APPENDIX

Fig. 1 Interaction Effects of Race and Resource Scarcity on Inactivity

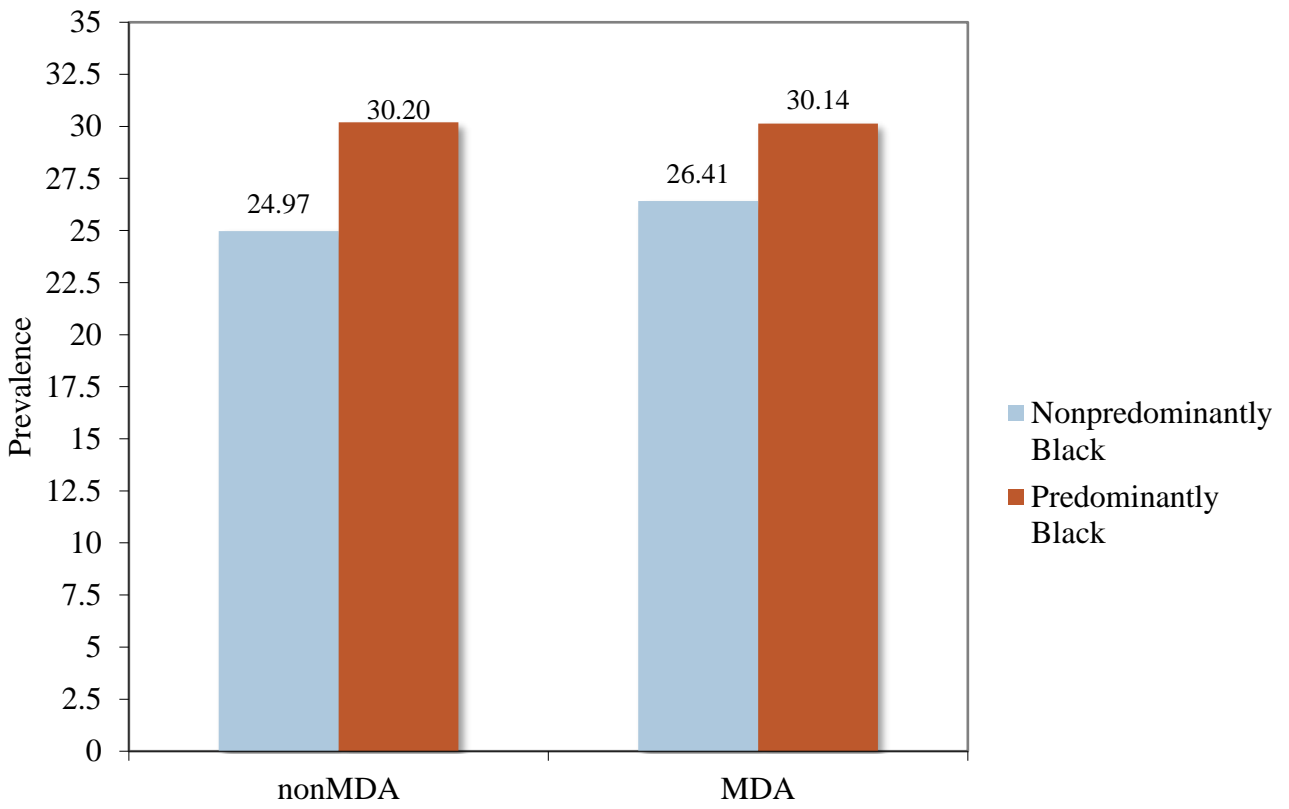


Fig. 2 Interaction Effects of Race and Resource Scarcity on Asthma

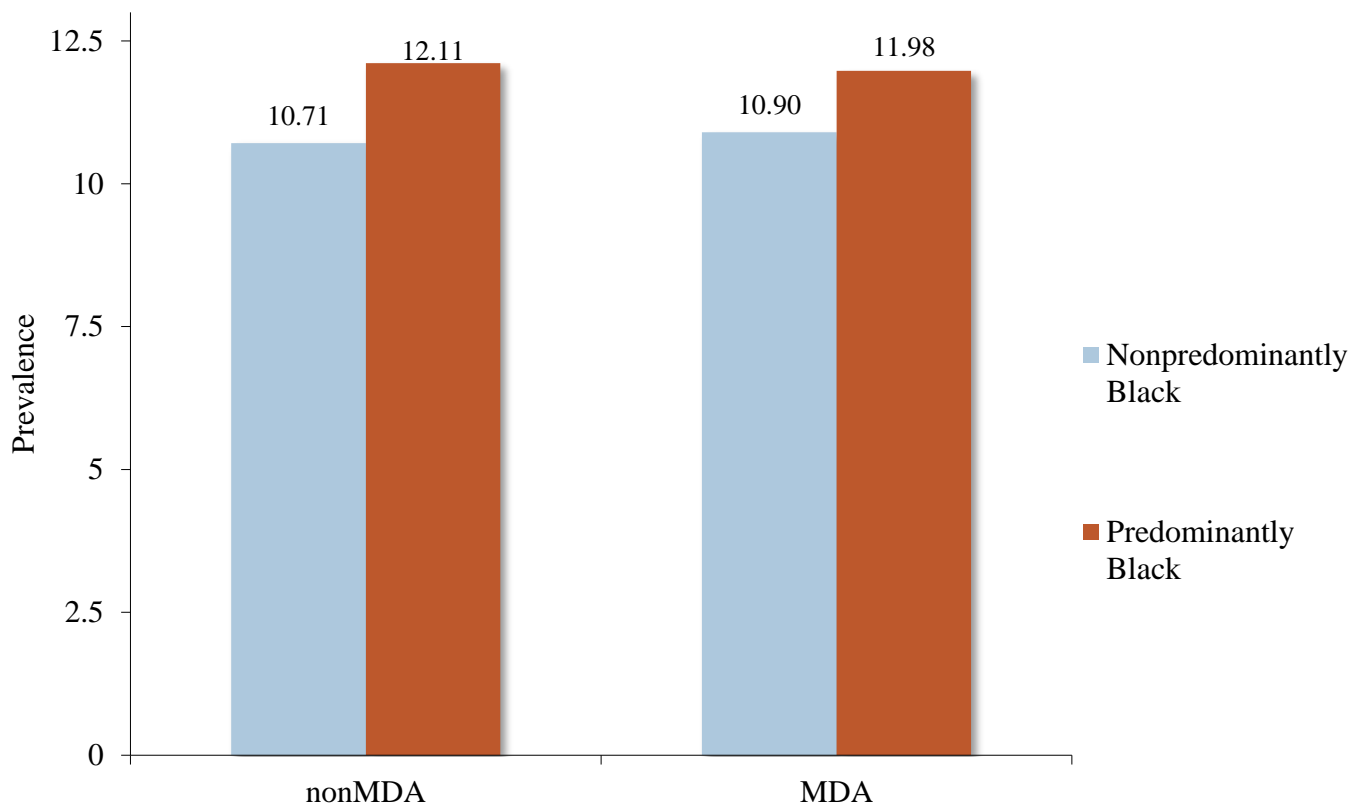


Fig. 3 Interaction Effects of Race and Resource Scarcity on Diabetes

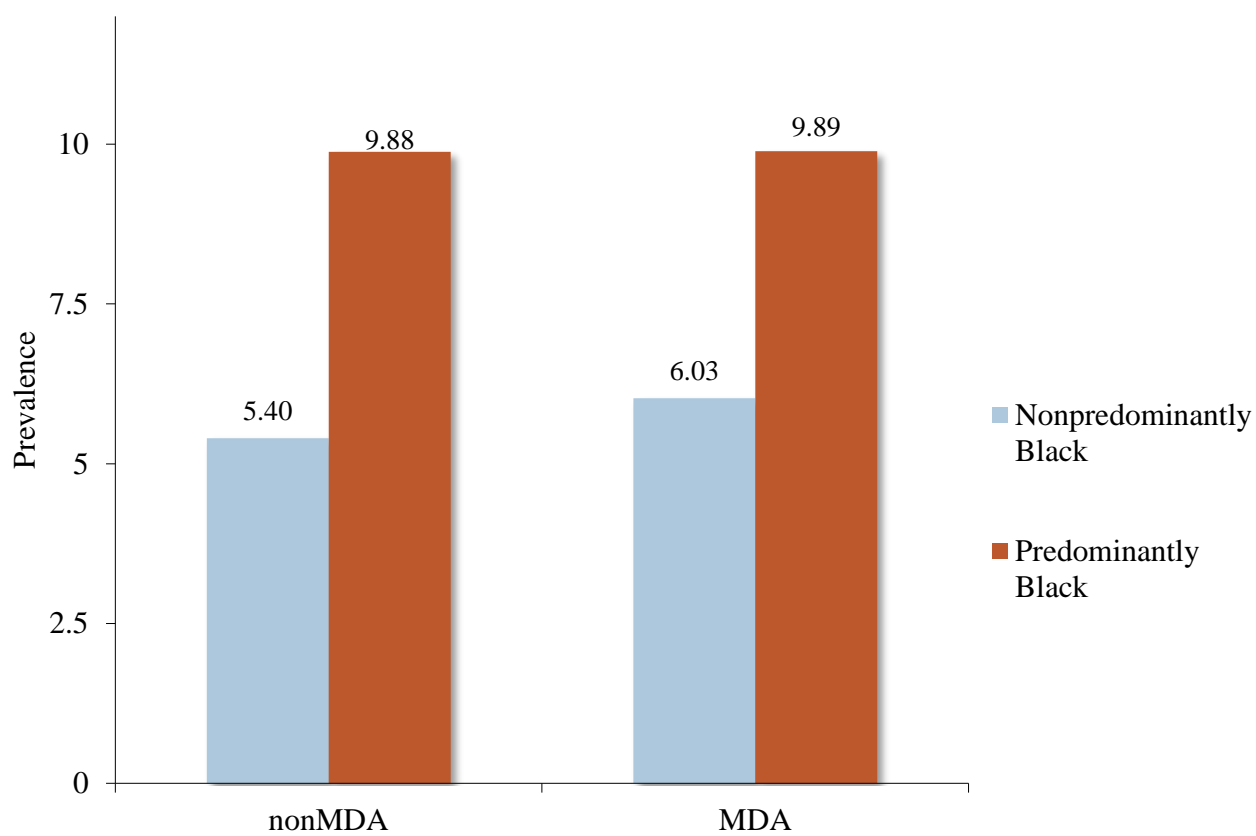


Fig. 4. Interaction Effects of Race and Resource Scarcity on Obesity

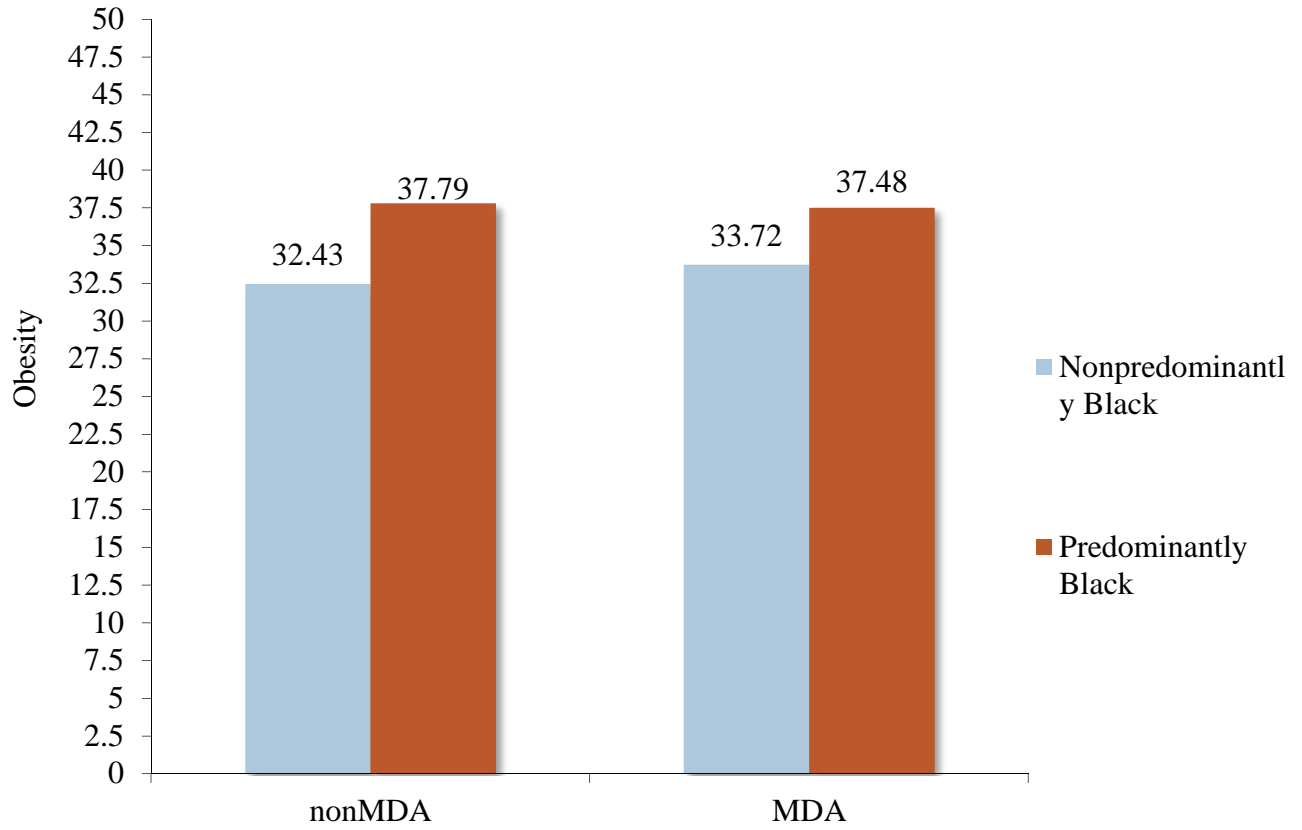


Fig. 5 Interaction Effects of Multiple Resource Scarcity and Class on Inactivity

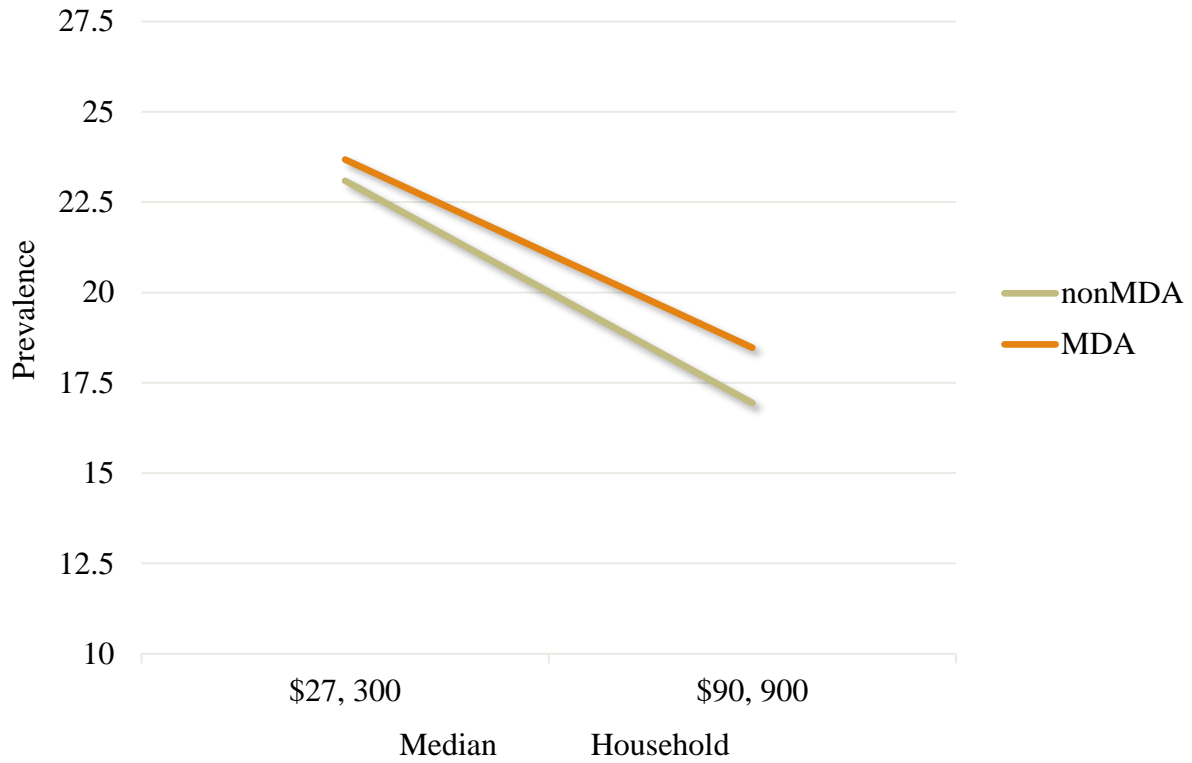


Fig. 6 Interaction Effects of Multiple Resource Scarcity and Class on Diabetes

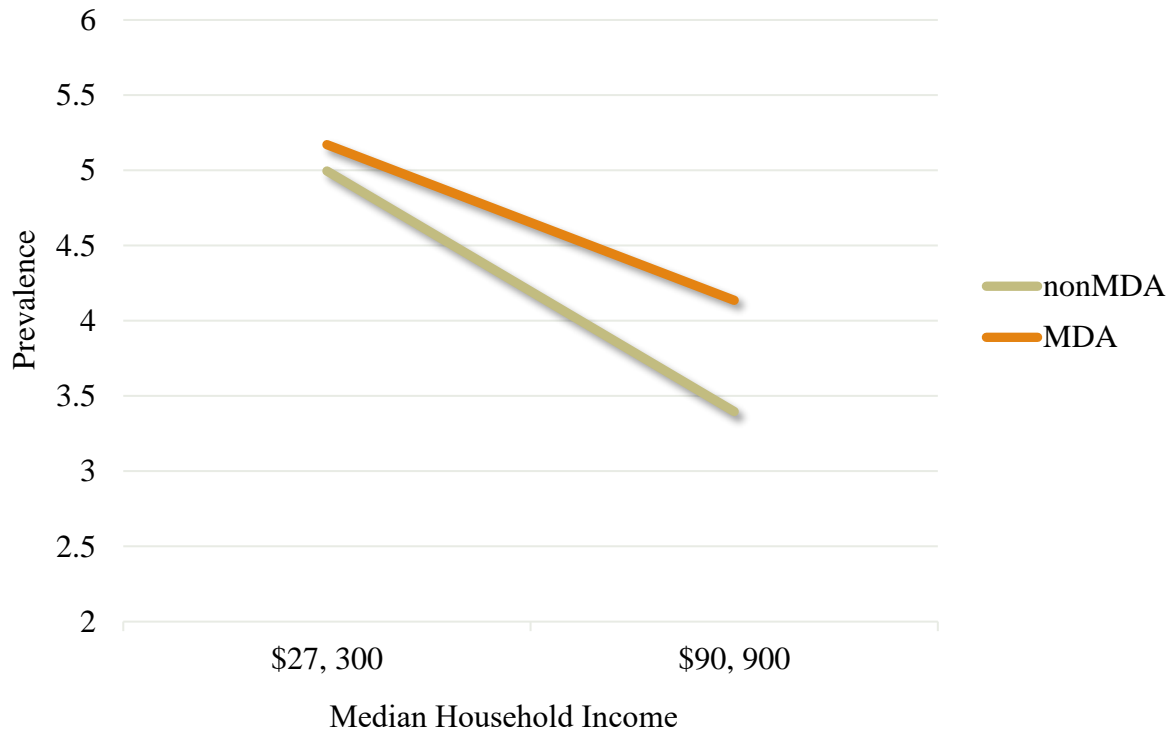


Fig. 7 Interaction Effects of Multiple Resource Scarcity and Class on Obesity

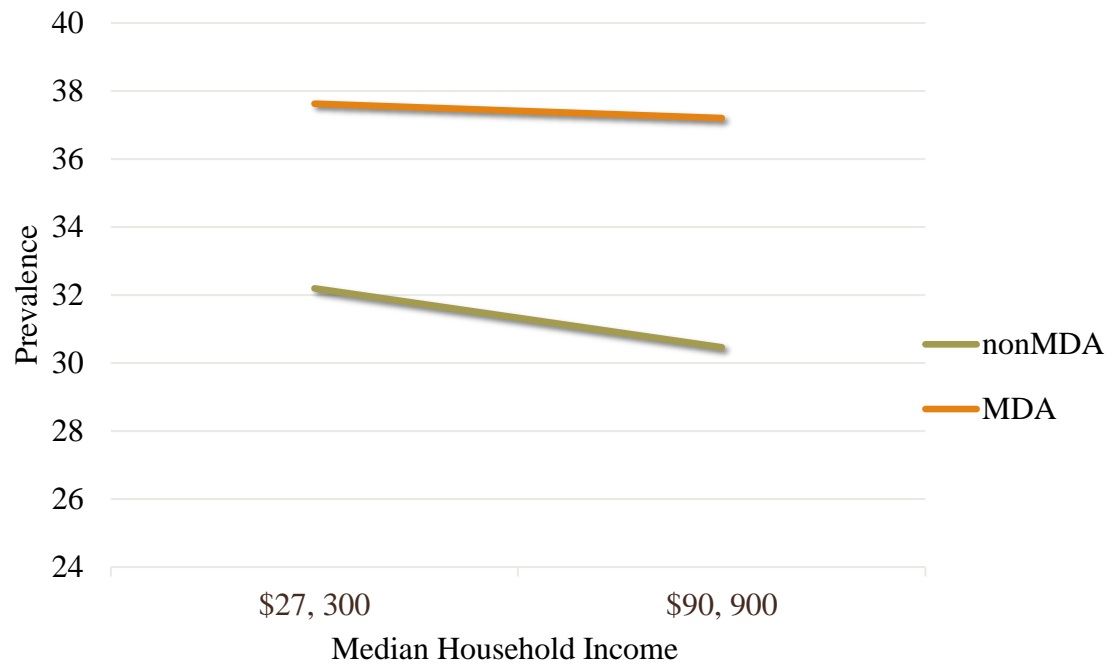


Table 5. List of Counties (N=15)

County	Largest City
Broward County, FL	Ft. Lauderdale
Dallas County, TX	Dallas
East Baton Rouge Parish, LA	Baton Rouge
Fulton County, GA	Atlanta
Hinds County, MS	Jackson
Jefferson County, AL	Birmingham
Jefferson County, KY	Louisville
Mecklenburg County, NC	Charlotte
New Castle County, DE	Wilmington
Pulaski County, AR	Little Rock
Richland County, SC	Columbia
Richmond, VA*	Richmond
Shelby County, TN	Memphis
Tulsa County, OK	Tulsa
Washington, DC*	Washington

*Independent City

CHAPTER IV

Eye of The Beholder: Perceived Access and Place Attachment in a Multiply-Deserted Area

INTRODUCTION

Since Gieryn's (2000) seminal work emphasizing a "space for place" in sociology, place has been increasingly examined in sociological study beyond traditional contexts as a locale for social processes and human interaction and instead as an integral element of historical change and social life (Gotham and Brumley 2002; Friedland and Boden 1994). The concept of place attachment focuses on the strength of an individual's connection to a particular place and captures the distinction between the goods and services provided by that place and the emotional and symbolic relationships people form with place (Brown et al 2015; Low and Altman 1992; Stewart, Williams and Kruger 2013). Depending on one's experience in place, this connection can be positive or negative, and this connection reflects and helps cultivate group and individual identity. Much of the research examining attachment to place in some capacity has focused on neighborhoods, and this research has shown that individuals have strong relationships with their neighborhoods or communities (Lewicka 2010, 2011; Raymond, Brown, and Weber 2010). Moreover, place attachment may be central to a well-functioning community and assist in community revitalization efforts (Fried 1963; Brown, Perkins, and Brown 2003). Research on attachment to *geographical* place is common across various disciplines including environmental psychology and critical geography, yet much of the sociological research examining this area focuses on *community* attachment, defined as social bonds to a community in place (Jennings and Krannich 2013; Lee and Blanchard 2012). Sociology has yet to create a "space" for *place* attachment, and a sociological exploration of human-place bonds can highlight how macro-level structures shape micro-level processes.

Place has been defined in multiple ways across various disciplines (see Massey 2013 and Cresswell 2014). Among the most notable definitions in social science is Gieryn's (2000) multifaceted conceptualization of place as having a 1) geographic location; 2) material form; and 3) invested meaning and value. Drawn from environmental psychological and social psychological theories of affect and emotion, this concept integrates the material nature of a geographic site with the cultural and psychological meanings we invest in them. Furthermore, this conceptualization of place is often invoked in research at the intersection of *sociological* social psychology and urban geography (Hernandez et al 2007).

The last two decades of research has demonstrated that place attachment shapes and is shaped by a multitude of social and environmental factors (Bonaiuto et al 2016; Lacy 2004; Lewicka 2005,2011). Moreover, strength and type of place attachment varies and depends on additional factors associated both with the places themselves (e.g., their scale, size, physical and social characteristics) and people (e.g., their social and economic status, residence length, mobility, age, sense of security, social relations in the place and value system) (Galster 2001; Lewicka 2005, 2011; Putnam 2007; Scannell and Gifford 2010). Though the last two decades of research point to increasing importance of place to social scientists, in sociology, place attachment remains understudied. This negligence is especially glaring because of the abundance of studies centering urban life and urban experiences by urban sociologists (Hunter and Robinson 2016; Lin and Mele 2012).

One could assume that place attachment in neighborhoods would vary according to neighborhood characteristics such that living in a neighborhood with limited resources and opportunities would foster less place attachment. In general, evidence supports this assumption—place attachment declines with increased neighborhood deprivation, largely due to effects of

deprivation on social cohesion and crime/safety (Bailey, Kearns, and Livingston 2012; Sampson 1998). However, research on discordance between perceived and objective access to neighborhood resources as well as the persistence of place attachment among residents of places with negative physical or social characteristics suggests that the relationship between place attachment and neighborhood characteristics are more complex particularly in degraded or under resourced places (Caspi et al 2012; Gotham and Brumley 2002; Lewicka 2005).

Relatedly, research examining spatial access to material resources such as food, healthcare, and greenspace demonstrate inequality in the quantity and quality of health-related resources across race and class lines, with areas with a shortage of these resources designated as “deserts” (Dai and Wang 2011; Qato et al 2014; Zenk et al 2005). Moreover, findings from more recent research highlight how this resource scarcity occurs in neighborhoods in a compounded nature such that neighborhoods are simultaneously food, pharmacy, and greenspace deserts (See Chapter Two). These patterns of resource scarcity at the neighborhood level have negative implications for health and social outcomes, yet little is known about how individuals who live in resource-deprived areas experience such places and how this experience might impact individual feelings, emotions, and behaviors related to their neighborhood.

Emphasizing this break in empirical understanding of the individual experience of living in a resource desert, Dorceta Taylor, a pioneer in environmental justice studies, has critiqued food desert research as reducing individual experience to “dots on a map” and has posited that despite what statistical data may reflect, persons living in deserts might have a different lived experience that should be opined in sociological studies of access (Taylor and Ard 2015). Moreover, despite access to supermarkets, many residents of predominantly racial minority neighborhoods have access to food via ethnic markets and small grocers (Joassart-Marcelli et al 2017; Short et al 2007).

In addition, current deserts research ignores the coping and food sovereignty strategies residents employ in response to limited food access (Levkoe et al 2020; Reese 2018; Taylor and Ard 2015). This is particularly troublesome since many individuals living in resource deserts, namely Black and/or poor people, are already pushed to the margins and silenced both in sociological study and broader society. Further, these experiences should be spotlighted when policy makers and community interventionists look to remedy neighborhood resource scarcity.

This chapter utilizes data from 19 in-depth interviews with residents of a multiply deserted area to explore 1) how residents in an objectively-resource scarce neighborhood demonstrate attachment to their neighborhood, 2) perceived access to material resources for these residents, and 3) how perceptions of access relate to place attachment among residents.

BACKGROUND AND THEORY

I first review theoretical and empirical research on place attachment. Much of this section draws from relevant literature in urban studies/urban geography as well as environmental psychology. I then review literature on perceived versus objective access in neighborhoods, drawing from literature on resource deserts. In this section, I also briefly discuss the importance of including qualitative examinations of access in neighborhoods rather than sole reliance on GIS-based assessments.

Place and Place Attachment

The literature on place spans several disciplines, including anthropology, phenomenological geography, environmental psychology, and urban sociology. This multidisciplinary scholarship generally has two main assumptions: 1) individual relationships to places are pliable, fluid, and evolve over time; and 2) setting, location, and space become a place as individuals and groups invest them with meaning, value, and affect (Gieryn 2000; Manzo 2003; Tester et al 2011;

Twigger-Ross and Uzzell 1996). In sociology, “place” has been extensively examined (though not explicitly noted) within the discipline as an integral element of historical change and social life (Friedland and Boden 1994; Gieryn 2000). Moreover, sociological studies that are not explicitly “place studies” but are inherently *about* place are ever-present (Gieryn 2000). Thus, a review of sociological studies of place reveals a definition of “places” with three main features: they are unique spatial locations of finitude but have analytically and phenomenologically elastic boundaries; they have physicality; and they have vested meaning and value (Gieryn 2000). The overwhelming conclusion on the nature of “place” in terms of sociological function is that place matters for politics and history, inequality and identity, and community (Gieryn 2000). Moreover, place can vary in geographical size—from a sprawling nation to the four walls and roof of a house—or, the focus of this study, the intangible and tangible bounds of the neighborhood. One of the main concepts emerging from this interdisciplinary research area and its underlying assumptions is place attachment.

Place attachment at the individual and community levels is generally believed to be an attachment to a particular location created and maintained through people’s interactions with their environment and the people in that environment (Low and Altman 1992; Trentelman 2009). This attachment can provide a sense of security and comfort, personal and group identity, and can help individuals develop a sense of community (Brown and Perkins 1992; Chawla 1992; Manzo and Perkins 2006). Scholars have conceptualized place attachment in various ways, yet a consistent theme among these definitions is a description of place attachment as multidimensional. In their influential work, Low and Altman (1992) posit that place attachment involves “an interplay of affect and emotions, knowledge and beliefs, and behaviors and actions in reference to a place” (72). More simply, Low and Altman (1992) assert that place attachment involves three factors:

affect, cognition, and practice. Affect encompasses the emotional attachment individuals make to place, while cognition describes the beliefs, thoughts, and knowledge related to place. Practice, then, concerns the behaviors and attitudes that occur within the spatial contexts of place (Kyle, Mowen, and Tarrant 2004; Low and Altman 1992). Scannell and Gifford (2010) offer a more comprehensive, tripartite model of place attachment¹² that includes three parts: person, psychological processes, and place. The psychological processes— affect, cognition, and behavior— reflect Low and Altman’s conceptualization of place attachment and represent how individuals experience and express their attachment to a place (Scannell and Gifford 2014). These psychological processes are particularly interesting for understanding place attachment in relation to perceptions of access. Thus, the current study draws from this understanding in exploring residents’ place attachment.

Affective elements of place attachment center on the emotions that people attach to places while they are in or thinking about the place. These emotions or affective states are more often positive (e.g., happiness, pride, love, enthusiasm, confidence, contentment), but they can be negative (e.g., anger, sadness, guilt, fear) or ambivalent when the place represents a traumatic or painful memory or when the place has undergone devastation or drastic change (Scannell and Gifford 2014). Cognition is an inherent element of place attachment, as the action of imbuing meaning to place is integrally a cognitive process. The cognitive component involves the knowledge, beliefs, and memories that *make* a place meaningful. More specifically, cognitive connections to place include place history, place affordances (i.e., the options or possibilities made

¹² Other conceptualizations of place attachment include Guest and Lee’s (1983) two-dimensional conceptualization of place attachment as sentiments and evaluations as well as Kasarda and Janowitz’s (1974) assertion of attachment of place as having three conditions (a sense of being “at home”, an interest in knowing what goes on in the area, being sorry if forced to move away).

available by place), and memories of the place, its people, and events occurring in that place (Scannell and Gifford 2014).

Behavioral elements of place attachment represent expression of place attachment in actions in and around the place. Much of the research on behavioral components of place attachment have examined this component for places in which the individual does *not* live (e.g., vacationing in the same city/same resort every year, pilgrimages) (Mazumdar and Mazumdar 2004). However, the behaviors that both express and facilitate place attachment have received less focus in this research area. To that point, except for proximity-seeking and stewardship behaviors (i.e., protection, maintenance, and preservation), researchers have not developed a list of observable behaviors that indicate place attachment (Scannell and Gifford 2014; Togoli 2003). Because social relationships and community attachment are closely tied to place attachment, defining behaviors that express place attachment in terms of whether and how these behaviors facilitate community is a step towards refining the behavioral component of place attachment.

Several scholars have empirically examined the effect of various social factors on place attachment (e.g., social interactions/support, social ties/capital, social homogeneity, crime) as well as physical factors (e.g., dwelling space, neighborhood layout, community size, accessibility) (Brown et al 2004; Lewicka 2005, 2011; Rollero and Piccoli 2010; Riger and Lavrakas 1981; Taylor 1996). In these foundational studies of urban “slum” neighborhoods, Fried and Gleicher (1961), Taylor (1982), and Woldoff (2002) find that, even for neighborhoods experiencing ongoing disinvestment and physical decay, residents’ attachment to the neighborhood never wanes. These findings highlight that, because much of place attachment depends on residents’ perceptions rather than reality, the social quality of the neighborhood (i.e., the people/social relations) can drive attachment to place despite lacking physical quality. The effect of place

attachment on various outcomes has been explored, including the impact of place attachment on pro-environmental behaviors, recreation behavior, mobility, perception of hazard risk and neighborhood quality perceptions (Banaiuto et al 2016; Devine-Wright 2011; Gustafson 2001; Halpenny 2010; Rogan et al 2005). Further, studies examining the predictive relationship between perceived or objective access to greenspace, greenspace quality, and place attachment have had mixed findings (Arnberger and Eder 2012; Kimpton et al 2014). Thus, the current study seeks to contribute to the environmental psychology and urban studies literature a better understanding of place attachment processes and the social and physical factors that shape them.

Perceived Versus Objective Access

Access represents the *ability* to obtain a resource with ease, providing a measure that evaluates the relative opportunity for contact or use (Wang, Brown, and Liu 2015). Perceived access, then, refers to individuals' own subjectively measured ease of access to resources. In neighborhood contexts, perceived access refers to resident's subjectively measured ease in obtaining certain tangible or abstract resources within their neighborhood. In contrast, objective access in neighborhoods refers to the *geographically*-measured ease with which residents can obtain resources within neighborhood bounds. In studies of tangible resources, objective access usually emphasizes physical distance to resources, but more recent research has also explored physical distance in conjunction with size and quality of resources. Access to resources such as food and physical activity environments (i.e., parks and walking trails) has been largely based on objective, GIS-based criteria (Caspi et al 2012; McKinnon et al 2009). This research uses straight-line or street-network distance from centers of population (i.e., geographical location where population is most dense) to a designated, material resource within the bounds of zip code areas, census tracts, or census block groups.

In addition to recent research that points out the limitations of GIS-based measures of access (Cummins and Macintyre 2009; Liese et al 2010; Powell et al 2011), recent studies highlight that residents' perceived access to resources might be in stark contrast to their objective access. For example, in examining the differences between objective distance to supermarkets and perceived access to supermarkets in relation to fruit and vegetable intake among low-income housing residents, Caspi et al (2012) find high negative discordance between perceived access and objective access. That is, residents report not having a supermarket within walking distance despite there being a supermarket within 1 km (~.62 miles). Moreover, perceived access rather than objective access is positively associated with fruit and vegetable intake. In addition, Gustafson et al (2010) examines differences between perceived and objective access to food stores in relation to diet and weight among low-income women in North Carolina and find positive concordance between perceived and objective access to food stores. That is, residents with food stores in their neighborhoods perceived their neighborhoods as high in availability of healthy foods relative to those with no food stores in their neighborhoods. Also, objective access rather than perceived access was positively associated with body mass index (BMI) as well as fruit and vegetable intake. Additionally, Jones, Hillsdon, and Coombes (2009) examine perceived and objective access to greenspace in urban areas and find that the accessibility of greenspaces is better in more deprived areas, but those residents have more negative perceptions and are less likely to use the greenspaces. These and other studies point to a need for a more nuanced examination of perceptions of access to resources among neighborhood residents. Moreover, no studies have examined perceived access to pharmacies or perceived access to multiple resources in urban contexts. This chapter examines perceptions of access for residents in multiply-deserted areas and thus contributes to knowledge in this area.

Many studies using GIS software for measures of access discount that interactions between individuals and their environments are more complex and dynamic than can be captured by GIS alone. GIS-based measures are limited in their ability to measure store utilization, or residents' actual access to stores. For instance, physical barriers or dangerous traffic may make walking routes to stores unsafe or impossible. Alternately, residents may frequently shop at supermarkets that are outside the geographic limits of “access” assumed by the study (Inagami et al 2006), particularly if they own a car. Both scenarios would result in an underestimation of the impact of proximity to supermarkets on diet as well as the influence of other material resources such as pharmacies and greenspace.

To date, very little research has directly compared perceived and GIS-based measures of neighborhood access to resources in the built environment. Much of this research focuses on access to grocery stores/other retail, restaurants, or schools, and a handful of studies focus on access to greenspace (e.g., parks, walking trails) or blue space (e.g., lakes, rivers, coastal areas) (Orstad et al 2017; Wu et al 2021). One study of three U.S. communities showed that these two measures appeared to be correlated, but not identical (Moore, Diez Roux and Brines 2008). Another recent study, however, showed that objective access to food stores was unrelated to perceived availability of healthy foods, and that there was an *inverse* relationship between perceived and objective food store availability (Gustafson et al 2011). Results from other studies which have used both types of measures generally support the idea that perceived access is an important construct that may be associated with dietary behavior (Moore, Diez Roux, Nettleton and Jacobs 2008; Sharkey, Johnson, and Dean 2010), perhaps even above objective measures (Giskes, Van Lenthe, Brug, Mackenbach and Turrell 2007; Moore et al. 2009; Williams et al. 2010). It has been suggested that different measures of food access represent different underlying constructs (Moore, Diez Roux,

and Brines 2008), but clearly more research is needed to determine how different measures of food and other material resource access relate to one another, and how they might be linked to health behaviors. Considering these limitations, there is some justification for looking beyond GIS-based assessment measures of local environments and including participants' reports about their neighborhood.

The limitations of previous research provide ample justification for looking beyond GIS-based assessment measures of local environments and including participants' reports about their neighborhood. Here, I look at objective versus perceived access of three types of neighborhood resources: grocery stores, pharmacies, and parks. By focusing on an objectively deserted area (i.e., an MDA), this study contributes to our understanding of how objective neighborhood disadvantage might operate in concordance or discordance with how residents of these spaces perceive access to multiple resources.

DATA AND METHODS

Data and Sample

To explore the relationship between objective and perceived access to material resources in neighborhoods and how perceived access is related to place attachment among residents of multiply-deserted areas, I conducted in-depth, semi-structured interviews and collected survey data from 19 residents of a public housing residence in a multiply-deserted area in an urban city in the southern United States. To be included in this study, participants had to be current residents of the public housing complex, at least 18 years of age and had lived in the public housing residence for at least 30 days. Residency criteria was included for two reasons. First, limiting the sample to public housing residents in the neighborhoods helped to “control” for income. Department of Housing and Urban Development (HUD) public housing standards require residents to meet

income guidelines that limit individual income, so variation in income among residents was limited. Second, research on neighborhood place attachment and housing indicates that residents living in single-family homes are more likely to be “rooted,” longer-term residents with no plans of relocation compared to residents in multi-unit residences (Kamalipour et al 2012; Riger and Lavrakas 1981). Including both neighborhood residents who lived in single-family homes as well as residents in multi-family homes might bias findings related to place attachment and its relation to perceived access. Age criteria were included to omit children and adolescents (who are likely to have limited perceptions of access and sense of place) from the sample. Length of residency criteria was included to exclude newer residents whose attachment to the neighborhood and/or perceived access might be limited. Lastly, I interviewed respondents in this particular neighborhood because of its designation as multiply-deserted area (MDAs) and location within a southern, urban county that has widespread resource scarcity as uncovered in Chapters Two and Three.

Sampling for the study largely relied on snowball sampling after initial recruiting. I recruited respondents by placing flyers in common spaces in the apartment office and passing out flyers door-to-door. Interviewees were asked to pass along my contact information to other residents if they so desired. All interviews¹³ were recorded in person at a local library that was .6 miles (i.e., a 3-minute walk) from the housing complex. Interviews lasted about one hour and were conducted between June 2019 and September 2019. Participants completed a brief survey¹⁴ that included a series of background questions as well as a 12-item Place Attachment Inventory (Williams and Vaske 2003), a 6-item Kessler Psychological Distress Scale (Kessler et al 2002), and Likert-scale questions on self-rated health (SRH) and self-rated mental health (SRMH). To

¹³ Interview protocol included in Appendix.

¹⁴ Survey included in Appendix.

maintain confidentiality, each respondent is identified by a pseudonym that is not shared by any of the residents in the sample. This study also makes use of neighborhood mapping methodology (Lohmann and McMurren 2009), wherein participants are given a map of their neighborhood (i.e., census tract) and surrounding census tracts and asked to draw the boundaries of their neighborhood. The map¹⁵ appears as a large polygon, and the census tract boundaries are invisible. For reference, stores, street names, and other locations such as schools and churches are added to the map so that neighborhood residents can visualize the neighborhood boundaries themselves.

Sample Characteristics

Table 1 reports demographic characteristics for each respondent along with their pseudonyms. The sample included 11 women and eight men and every resident self-identified as Black. The age of residents ranged from 22 years to 54 years, and the average age of respondents was 36.5 years. Three residents were divorcees while the rest were single/never married (n=16). All except two residents had at least a high school diploma, several residents had some college or trade school education (N=8), and one resident had a bachelor's degree (N=1). Twelve out of 19 residents had at least one coresidential child. Average length of residence across the sample was 15.8 years, and 12 out of 19 residents indicated that they owned a personal vehicle. Last, nine out of 19 residents were employed: six were employed full-time while the other three worked part-time. The other 10 residents were not in the labor force.

[Table 1 about here]

Site Characteristics

The interview site is a designated MDA and is undergoing continual economic decline rather than upward neighborhood change. This assessment is based on both my inside knowledge as a native

¹⁵ Map with location pseudonyms included in Appendix.

of the city and measured decline over time based on decreased or stagnant median household income, percent bachelor's degree, and percent homeownership¹⁶. In 2000, the median household income for this neighborhood was about \$26,000. In addition, 9.4 percent of neighborhood residents had at least a bachelor's degree, 51.4 percent of neighborhood residents were homeowners, and the unemployment rate was 7 percent. At the time of the study, these demographic characteristics either held or worsened, with about 52 percent of residents owning their homes, 8.6 percent of residents with a bachelor's degree or higher, unemployment rate of 23 percent, with median household income of about \$21,000.

Positionality

As a Black woman who is a native of the urban, southern city where the interview site is located and who is a former resident of the site, but who has also experienced upward mobility in recent years, I am uniquely positioned as both an insider and an outsider. I share a racial, residential, and local background with respondents, but I do not currently share their socioeconomic status. To partially position myself as an insider, I explained my residential and local background before each interview. Sharing this information might lessen respondent apprehension and abate some of the inevitable "outsider" perception that interviewers face. In coding and analyzing the data, I also recognize how my position as an insider-outsider might shape the meaning that I imbue to participants' words and actions as well as the way that I organize participants' responses in this chapter. The challenge throughout each stage of this study was to be mindful of my insider-outsider status and how this position might impact interviewee responses, subsequent analysis, and interpretation and dissemination of findings.

¹⁶ As measured in previous literature by Hwang and Sampson (2014)

Measures

Place attachment. Place attachment was assessed qualitatively using participants' responses to interview questions about their emotional connection to the neighborhood (affect), memories, knowledge, and place affordances, and behaviors. Although quantitative means of measuring place attachment (i.e., scales) can capture the variation in subjective importance and strength of affective bonds with place among residents, this approach falls short in capturing the rich subjective meaning residents might give place. In the semi-structured in-depth interviews, place attachment was assessed with open-ended questions related to emotional attachment to the neighborhood, cognitions (memories, history, affordances) about the neighborhood, and behaviors/activity within the neighborhood. This three-dimensional measure of place attachment offers a richer description of the dynamics of place attachment for the residents. Affective components of place attachment were coded in the data based on residents' responses that reflected emotional and/or sentimental connections with the neighborhood (e.g., *I love my neighborhood*). Affect is often considered a central component of place attachment and represents a rich emotional investment into place. Cognitive components of place attachment were coded in the data based on residents' responses that reflected place history, place affordances, and memories of events or people. Behavioral components of place attachment were coded in the data based on resident's reports of activities and engagement with other residents in the neighborhood.

Access. Perceived access to material resources is assessed based on resident responses to questions that ask whether there is enough of that resource in the neighborhood (e.g., *Do you think there are enough [places to shop for food/pharmacies/parks] in your neighborhood?*). Objective access to material resources was not assessed directly in this study methodology because data from previous research indicated that the study site is in a neighborhood designated as a multiply-

deserted areas such that there was resource scarcity of at least two resource types. Respondents lived more than one mile (in both straight-line and street network distance) from the nearest grocery store, pharmacy and park. This measure of objective access is used to explore the relationship between objective and perceived access in this study.

Analysis

Interview data were transcribed using a paid, online transcription service and were coded using Atlas.ti software. Coding involved relevant themes related to residents' perceived access, affective attachment, cognitions, and behaviors related to the neighborhood. The qualitative software program, Atlas.ti, helped uncover the process by which residents in low-income, resource scarce neighborhoods perceive access to these resources, how residents demonstrate place attachment, and how perceptions of access relate to place attachment.

RESULTS

The goal of the current study was to examine the lived experience of residents in multiply-deserted areas and answer three related questions. First, *how do residents in multiply-deserted areas demonstrate attachment to their neighborhood?* Here, I rely on residents' qualitative responses. Second, *what is the relationship between objective access and perceived access of residents in multiply-deserted areas?* That is, to what extent do the perceptions of access to grocery stores, pharmacies, and parks for residents in MDAs align with or diverge from the objective MDA measure used in macro-level, quantitative analysis? In examining this relationship, I also rely on respondent's qualitative responses. Third, *what is the relationship between perceived access and place attachment among residents in multiply-deserted areas?* That is, do differences in perceptions of access explain any observed variation in place attachment? I rely on categorization from findings for the first research questions and qualitative interview data to examine this

relationship. Below, I outline main findings in three sections: Place Attachment as Process, Objective Access versus Perceived Access, and Perceived Access and Place Attachment.

Place Attachment as Process

The affective, cognitive, and behavioral manifestations of place attachment became apparent almost immediately as residents shared narratives about how they “ended up” in the neighborhood. For some, living in this neighborhood was all that they had ever known, with generational ties to this area of the city. For others, this neighborhood was one stop in their life’s journey, a place of refuge after job loss, divorce, or familial disputes. Such residents were from other parts of the city, other more rural parts of the state, or from out-of-state. Interestingly, those who demonstrated less affective attachment had much more to say as it relates to their cognition and their relation to the neighborhood. Likewise, even respondents who demonstrated strong emotional connections to the neighborhood spoke at length regarding the cognitive elements of attachment. Below, I highlight major patterns in the affective, cognitive, and behavioral components of the responses. It is important to note that place attachment itself is dynamic and elusive. Though place attachment is theoretically segmented into three distinct components, individuals, both in drawing on and demonstrating place attachment, sometimes do not. Thus, resident responses might reflect multiple components. Below, I summarize the basis under which each component of place attachment became perceptible.

Affective Attachment. Across the sample, affective demonstrations of neighborhood place attachment were characterized by *attribution* of emotions and sentimental feelings to other neighborhood residents. While initial gauges of affective attachment came from the question “Do you feel like you have an emotional attachment to the neighborhood?”, elements of affective attachment surfaced throughout the interviews. Especially for longtime residents, the people and

social relationships that they cultivated were a large part of their emotional attachment as well as the memories and shared trauma of community members being killed and/or “passing away” while living in the neighborhood. Residents reflected on both good and bad times as they unpacked their emotional connection to the neighborhood. With angst in his voice, Delroy (age 33) explains his emotional attachment: “I lost a couple of friends. I've seen a couple of friends get killed in the neighborhood. Grandmas from the neighborhood, granddaddy died in the neighborhood, step daddy died in the neighborhood so, that's one reason why. It's just my place.” Chadwick (age 48) asserts “It's just the people. Just the neighborhood itself and the people. People, that I've been knowing since, like, knee high. Now our children growing up together and some of us, our grandchildren growing up together. I've known people that died and people that got shot and survived.” Tonya (age 34) had similar sentiments, recalling “My mother and grandmother are both deceased. We basically grew up out here, you know, watching them grow up as parents and they watched us grow up as kids.” Delroy, Chadwick, and Tonya's explanations highlight how place can become personally significant through death. Similar to the habitual visits to the gravesites of those with whom individuals shared close, personal ties as well as the places where these individuals died, death fosters emotional ties to places one might otherwise find insignificant.

For those who demonstrated little affective attachment to the neighborhood, responses regarding neighborhood social relationships and emotional connectedness were terse and ambivalent. Victor (age 37) confesses, “Well, I don't feel attached. I feel like that's where I'm staying at for now 'cause that's where I'm at. I'm just here trying to leave.” Likewise, these emphatic “no” responses centered around the neighborhood not being the place residents spent their childhood or a place in which their family resided. Monica (age 27) asserts “No, not really. because that wasn't where I grew up at. Like if I left, it wouldn't just hurt me like that.” James (age 50)

explains, “No. I never, I hadn't stayed in this location long enough to form, like, you know, a personal attachment. Uh, and neither has my family, you know, or extended family.”

Cognitions. Initial gauges of cognitive attachment came from the question, “Does this neighborhood [referring to the neighborhood the respondent had just outlined on the map] have a name?” All residents responded “yes” to this question, but the name of the neighborhood varied. Across the sample, there were five different names residents used to refer to their neighborhood. After this initial question, much of the residents’ cognition centered on the nature of their connection to the neighborhood, the positive and negative impacts, and how the neighborhood had changed since they moved in. In their responses to these prompts, many residents spoke to how the neighborhood had provided them with things they found valuable, or what Scannell and Gifford (2014) refer to as place affordances. These benefits were usually abstract and consistently emerged when residents spoke about themselves in relation to the neighborhood in reflections on the positive and negative impacts of the neighborhood. In explaining her connectedness, Mahogany (age 41) maintained, “A lot of my character comes from my neighborhood, the way I am, the person that I am. Does it *define* who I am? No, but the make-up of me comes from me being out here in this area.” In the same way, Chadwick contended, “It taught me how to be strong, taught me how to survive under any circumstances. I just about know how to deal with any situation. Because of this neighborhood.”

Residents also drew upon salient, positive memories in the neighborhood, and these recollections demonstrated cognitive attachment as well. Many of the residents’ happy memories centered around community events either within the bounds of the housing project or across the neighborhood outside of the gates of the housing project. Vernon (age 22), a lifelong resident of the neighborhood, excitedly calls to mind a Halloween celebration from his childhood: “I

remember when, like, for Halloween, the whole neighborhood was like a huge, haunted house, so you could just ... The kids got to go around inside the neighborhood and trick or treat and that was just amazing.” Similarly, Victor calls to mind the yearly neighborhood festival. “We just chilling in one big ole park. That's the only thing that really just keep the neighborhood together, that festival.” As in other neighborhoods, community- and neighborhood-wide events seem to simultaneously provide residents with opportunities for recreation and socializing while also fostering cognitive attachment. In contrast to many other residents’ general concerns about crime and safety in the neighborhood, Phoebe (age 31) alluded to her feelings of safety and comfortability as the main abstract benefit the neighborhood offered. She explains, “I never had my house broken into, or anything like that, so I feel like it's a good area. That hasn't happened since the whole time I've been staying over here. So I feel safe.”

While most residents who demonstrated greater cognitive attachment emphasized the neighborhood’s abstract benefits, some residents’ cognitions were negative. Many residents tied their negative cognitions to tangible things and characterized the neighborhood in terms of crime and safety, infrastructure, and material resources. James irritatingly declares, “Which is probably one of the things that discourage me the most about this neighborhood, it's cause there's not much around. That convenience store right there is about the closest and other than that, there's, there's nothing. And, uh, if you're already, you know, kinda struggling to get around, it becomes a chore.” Moreover, while most residents emphasized their relationships with neighbors as a source of affective and cognitive attachment, Justice was one of a few exceptions. In contrast to the majority of residents in the sample, frustrations with her neighbors alienated her from the neighborhood. She explains, “They do a lot of arguing and all that, come outside they house and cussing. They had to call the police the other day. So, I don't feel like I'm a part of the... what they doing.” Other

residents' negative cognitions came up in describing how they felt the neighborhood had changed. For example, Pam (age 54) recalls, "When I first moved over here, it was all right then. All down the line it just started being them bad people shooting folks over there and everything. But when I first moved over there it was nice and quiet, weren't no stuff going on."

Interestingly, even respondents who demonstrated strong emotional, affective connections to the neighborhood demonstrated negative cognitions. These discussions were markedly in contrast from affective discussions. Tonya, a resident who had a strong emotional attachment to the neighborhood, differentiated between the *neighborhood* as a place she felt emotionally attached to and the *community* to which she was not connected to. She reveals, "The community that I stay in is not a good community. I don't feel like I have any trustworthy friends over there or somebody I can trust in order to say, "Hey, can you help me out?" without trying to steal something from your house or see what's inside your house or trying to get in your business or tell your business." This statement highlights the differences between attachment to place (as a geographical thing) and attachment to community (social) and how the social ties that make up one's community attachment can shape place attachment (Trentelman 2006).

Behaviors. Behavioral aspects of attachment were entangled throughout residents' explanations of their emotional and physical connectedness to the neighborhood as well as residents' discussions of actual access. Moreover, residents' behaviors involved both instrumental behaviors (i.e., behaviors done to achieve a goal) and consummatory behaviors (i.e., behaviors related to entertainment, fulfillment, or enjoyment). Vernon, a lifelong resident, charismatically talks about his time spent volunteering with Caring Hands¹⁷: "One of the things that *keeps me*

¹⁷ A local non-profit organization that works with housing project residents

there, one of the things I'm really proud of, is I still do volunteer work with the, the local non-profit in our community called Caring Hands. So, I get to mentor some of the young people there, and it really brightens up my day, plus I know everybody.” That this volunteer work “keeps” Vernon in the neighborhood speaks to how meaningful, consummatory behaviors demonstrate and continue to foster place attachment. Residents’ consummatory behaviors also emphasized sentimental values embedded in certain neighborhood locations. Reflecting this idea, Chadwick recalls his attachment to a nearby park: “I go to Summer Park ‘cause I went to school- I went to P.T. Marshall, the school right down the street from it, and we used to go to field trips there and walk there. I, I got a lot of sentimental value with that park.”

Residents’ instrumental behaviors also demonstrated attachment to the neighborhood. Monica’s connection to the neighborhood is linked to being able to shop within the neighborhood and explains, “I do [feel connected]. That's where we do all of our shopping at now. We don't have to go all the way across town. So, I feel real connected to it.” Tonya, a resident who demonstrated strong affective attachment and much less cognitive attachment, revealed through her behaviors that although there were no feelings of community from her adult neighbors, there was a connectedness to the children in her neighborhood. When asked what kinds of things she does in the neighborhood, Tonya proclaims, “I cooks. Um, basically, I'm the house where the kids come to when they want to watch a movie or they mad at their mama-. I’m basically auntie. They call me auntie.” Here it is evident that place attachment itself and residents’ evaluations of various dimensions of that attachment are often inconsistent.

Other residents decidedly spent no time in the neighborhood or with neighborhood residents, spending most of their time “at work or sleep.” Some of these residents avoided their neighbors for fear of misunderstandings and “drama” while others were busy with “life” or simply

preferred solitude. Both James and Phoebe are cases in point. When asked about things he does in the neighborhood, James maintains, “I just survive. I take care of myself, um, I have a lot of medical issues, so you know, that keeps me busy. I’m single and, um, pretty solitary, so I spend most my time just basically taking care of myself.” Echoing this attitude, Phoebe stresses, “I stay to myself. I don’t really get out too often to be around in the neighborhood as much as I should because I’ve worked so much, so me and my kids, we really don’t have time to come out and get associated with all the things in the area.” Additionally, heat was a factor that prevented both instrumental and consummatory behaviors for residents.

Objective Access versus Perceived Access

Objective access. In designating the interview site as a multiply-deserted area, I first define the neighborhood containing the interview site using U.S. Census tract designations. These census tract boundaries are a proxy for neighborhood boundaries. To designate the census tract as a multiply deserted area, I use a 1-mile buffer from the tract center of population to the resource destination (i.e., grocery store, pharmacy, and park or walking trail) as a guide for which neighborhoods are a desert. If there are no resources of each type within that buffer, the neighborhood is designated as a desert. If the neighborhood is a desert of two or more types, it is designated as a multiply-deserted area. Quality of resource types and quantity of resources were not included in this measure¹⁸. More detailed descriptions of this objective measure are available in Chapter Two. The interview site was located in a food-pharmacy-greenspace desert (i.e., residents lived greater than 1 mile from a supermarket, a pharmacy, and a park or walking trail).

Although residents lived farther than one mile from the nearest grocery store, pharmacy, or park, residents reported their actual access to resources in and around their conceptions of

¹⁸ With exception to the USDA-defined food desert measure, which only examined access to grocery stores that yielded at least \$2 million sales annually and had all major food groups in-store.

neighborhood. Resident's *actual* access to material resources became apparent when I questioned respondents on topics related to where they purchase groceries, fill prescriptions, and go for outdoor recreation as well as distance and walkability for these resource destinations. Distance was a prominent talking point for all respondents: this factor, in combination with other personal preferences and structural constraints, impacted shopping decisions as well as resource destination choices. This was especially so for those who did not have a personal vehicle. Moreover, when respondents were asked about how they accessed food, pharmacy, and greenspaces, they spoke more at length about how they accessed food in particular.

Residents went into great detail about the kinds of food they buy, where they buy this particular food item, and why they buy the food item at a particular store. Most residents traveled to the closest grocery stores and food destinations and fewer residents traveled farther to premium grocery stores and supermarkets or bought ready-made food from alternative food sources like convenience stores, casual dining restaurants, and delis. The food destinations mentioned by residents included Food Mart¹⁹, Budget Bag²⁰, Steve's²¹, EaseWay²², Dollar House²³, and Market Way²⁴. Importantly, although the closest grocery store (Food Mart) was outside of the one mile "desert" measure bounds, many residents (especially those with personal vehicles) referred to this store as "right down the street". Additionally, these access strategies for each group of residents

¹⁹ A small, lower quality grocer 1.4 miles (6-minute drive; 25-minute walk) from the housing project that also sells hot deli foods; no pharmacy.

²⁰ A small, lower quality discount grocer 2.8 miles (10-minute drive; 55-minute walk) from the housing project; no pharmacy.

²¹ A medium, premium grocer 5.7 miles (15-minute drive) from the housing project that sells hot deli foods; has pharmacy.

²² A convenience store/gas station .4 miles (3-minute drive; 7-minute walk) from housing project that sells cooked food.

²³ A "dollar store" that sells limited groceries (nonperishables, dairy, deli meats, frozen items). No fresh fruit, fresh meat, or vegetables.

²⁴ A large supermarket 9.9 miles (17-minute drive; 2-hour 28-minute walk) from the housing project that sells hot deli foods; has pharmacy.

were similarly executed in accessing pharmacies and parks. The parks and pharmacies mentioned included Summer Park²⁵, Medicine Mart²⁶, and Rx Depot²⁷. Figure 1 in the appendix shows a map of the census tract (i.e., the neighborhood proxy for quantitative chapters). The census tract boundaries are shown. Figure 2 is zoomed out to include many of the destinations that residents mentioned.

Perceived Access. Measures of perceived access in respondent interviews centered around one main question: “Do you believe there is *enough* [each resource] in your neighborhood?” Resident responses to these three questions are shown in Table 2. Because I asked residents about each resource separately, respondents did not mix their answers (e.g., talk about both grocery stores and greenspaces in one response). Table 2 indicates that, for these neighborhood residents, perceptions of access are not necessarily aligned with objective measure of access. The task at hand, then, is understanding *why* neighborhood residents demonstrated agreement and/or divergence with the objective desert measures. Table 2 also includes residents’ rationale for their responses to the main question (i.e., why they felt there was/wasn’t enough [resource type]). Tables 3a-3c show residents’ rationales according to their yes/no responses from Table 2 in order to more clearly observe any patterns in perceptions of access or lack thereof for each individual resource. As many residents had multiple rationales for their perceived access to each resource type, the figures in Tables 3a-3c are not mutually exclusive. I refer to those residents who reported access to a resource in their neighborhoods (i.e., said “yes”) as *Aye-ers* and those that did not report access (i.e., said “no”) as *Nay-ers*. Those who offered indisputably positive evaluations of their access were rare. In most cases, *Aye-ers* indicated somewhat tempered, but still positive, evaluations of

²⁵ A park 1.3 miles (6-minute drive; 26-minute walk) from housing project (Rx Depot).

²⁶ A national pharmacy brand 2.6 miles (8-minute drive; 51-minute walk) from housing project.

²⁷ A national pharmacy brand 4.7 miles (13-minute drive; 1 hour, 33-minute walk) from housing project.

access to resources. There was some variation in the ways *Aye-ers* and *Nay-ers* described their perceptions of access. There were three rationales provided by residents in explaining their perceptions of access to each of these resource types: those that emphasized *distance*, those that emphasized the *quantity* of resources, and those that emphasized the *quality* of resources.

Distance-related explanations were observed for both *Aye-ers* and *Nay-ers*. These explanations included statements about how far away or close a resource was, whether in absolute (e.g., one mile, four blocks) or relative (e.g., down the street, across town) terms. For *Nay-ers*, these explanations most closely reflected the objective, distance-based desert measures. *Nay-ers* who used this explanation made mention of how far the walk or drive was from the resource. In contrast, *Aye-ers* minimized the distance to these resources. For grocery stores specifically, the split between *Nay-ers* and *Aye-ers* was about even. In contrast, when residents were asked about pharmacies, no *Aye-ers* mentioned distance in their explanation, whereas seven *Nay-ers* did. Similarly, five *Nay-ers* referenced distance to parks in their rationale, compared to only one *Aye-er*. In some cases, distance was referenced along with quantity or quality for a resource type. This was especially the case for grocery stores. For example, Chadwick (age 48) enthusiastically explained that there were not just one, but *two* sources for groceries in his neighborhood: “It’s two good places, Food Mart and Budget Bag. It’s a lot of people round here that don’t have cars, so that’s where they go.”

Another way residents indicated access to resources is their recognition that quantity, relative to need, was an important way to evaluate access. Quantity-related explanations were observed across both *Nay-ers* and *Aye-ers* and across each resource. These explanations included numeric references as it relates to grocery stores, pharmacies, or parks, either in exact (i.e., only one, two, three) or approximate (e.g., a few, a lot) terms. In Chadwick’s discussion of the presence

of greenspace and parks, he explained, “It’s just one, and that isn’t enough. The neighborhood, as big as it is, could have another, at least one more, or two. It would give the children something to do.” Chadwick does believe people in the neighborhood have access to parks, but he does not believe there are enough of them. In contrast, Monica (age 27) in considering whether there were enough parks and walking trails pointed out, “We got Grove Park. We go the park at the apartments. Um, there’s another little park. There’s enough parks.” When asked about having enough places to shop for food, some residents’ quantity-related explanations also included alternative food destinations (i.e., dollar stores, convenient stores, fast-food restaurants). Among *Aye-ers*, this alternative quantity-related explanation was used consistently, while only two of six *Nay-ers* who gave quantity-related explanations mentioned alternatives. Quantity-related explanations were evenly split across *Nay-ers* and *Aye-ers* when it came to perceived access to parks, whereas *Aye-ers* more often mentioned quantity in their perceptions of access to pharmacies relative to *Nay-ers*. Moreover, only quantity-related explanations of perceptions of access to pharmacies were mentioned among *Aye-ers*.

For some residents, it is less a question of “if” the resource exists at all than what quality of resource they might receive there. However, quality-related explanations were less frequent among residents. Across each resource type, *Nay-ers* more often mentioned quality in their assessments of access, and only one *Aye-er* made mention of quality at all. Even then, this mention of quality referenced disparity. Twenty-two-year-old Vernon stated, “If you are a carnivore, I think there’s enough. **But if you want both healthy and fresh food, you won’t find it in this neighborhood.**” Vernon’s understanding—without my prompting—that a good grocery store did more than provide basic foodstuffs but provided nutritious (“healthy”) and high quality (“fresh”) foods indicates that some neighborhood residents recognized the same. Among *Nay-ers*, these

explanations included statements related to prices, customer service, product availability, amenities, and wait time. The quality of pharmacies seemed least relevant for residents relative to parks and grocery stores, and quality was most often mentioned in conjunction with distance and quantity rather than by itself. For example, twenty-nine-year-old Justice mentioned both Food Mart and Budget Bag, but their assessment of how “good” these places might be was less enthusiastic than Chadwick’s:

No [there’s isn’t access] ‘cause they run out of meat. It’s like they don’t stock up or something. They probably do, but it’s a lot of people surrounding this neighborhood. So having one grocery store [Food Mart] right here on East Side Drive, that’s where people are gonna go first. Once they go and see [the meat] is gone, they gonna go to Budget Bag.

Then where you have to go? Somewhere else, out the way... all the way out the way.

Justice’s recognition that the resource exists—there are two grocery stores accessible to this neighborhood—but that they were not great resources represents the kind of tension that exists when residents consider how much access they actually have to resources. Neighborhood residents thought critically about what access meant when considering the quantity and quality of pharmacies in their community. Mahogany (age 45) explained that this neighborhood once had both a Rx Depot and a Medicine Mart, but “they took the Rx Depot and made it a Medicine Mart, and the Medicine Mart (that was closer) is a plasma center now.” Residents like Mahogany and Justice argue that the closure of one of the two pharmacies presents a problem similar to the one Justice raised about grocery stores: if the one location runs out of supplies, it did not matter that there was a pharmacy in the community. They really need two:

One day, I did go to Medicine Mart and they did not have my baby medicine. They said they was out, they had to order some stuff. If everybody’s kid gets sick or something, need

the same thing, then we all runnin' to the same place that's close to us. Just like they closed the [other Rx Depot] right there off of Lowercase Street. They shoulda kept it open. (Justice).

[Table 2 placed about here]

[Tables 3a, 3b, 3c placed about here]

Concordance and Discordance. While resident's perceived access to each individual resource is important, I observe perceived access relative to the objective multiply-deserted area measure which examines compounded, co-occurring resource scarcity. Thus, evaluations of the relationship between the objective MDA measure and resident's perceived access to multiple resources is necessary. Neighborhood residents fell into two categories in terms of their perceptions of access to multiple resources: those who reported that there were enough of all three resource types or two resource types and therefore responded "yes" to the main question for two or more resources (i.e., discordant), and those who reported that there were enough of one out of the three resource types or that there were not enough of any of the three resource types and thus responded "no" to the main question for two or more resources (i.e., concordant).

Concordant residents indicated that the objective designation of the neighborhood as a multiply-deserted area matched their own evaluations of the neighborhood (i.e., there was not enough of two or more resource types). There were seven women and four men in this group, and the average age of residents in this group was 40. In addition, the average length of residence for concordant residents was about 17 years. Seven out of 11 residents indicated that they had a personal vehicle.

Discordant residents indicated that the objective designation of the neighborhood as a multiply-deserted area *did not* match their own evaluations of the neighborhood (i.e., there was enough of two or more resource types). There were five women and three men in this group, and the average age of residents in this group was 31. The average length of residence for persons in the group was about 14 years, and five out of eight residents indicated that they had a personal vehicle.

Perceived Access and Place Attachment

In their interviews, respondents varied in terms of their attachment to place, but this variation did not seem to be clearly related to perceptions of access to grocery stores, pharmacies, and parks. That is, residents, in their expressions of affective, cognitive, and behavioral attachment, did not explicitly mention grocery stores, pharmacies, or parks. As illustrated in the previous section, place attachment for these residents was rooted not in material resources, but in the social resources offered by the neighborhood: social relationships, social support, commemoration, and social homogeneity. While residents' overall satisfaction with the neighborhood seemed to be more directly related to perceptions of access in respondents' discussions, this was not the case for place attachment. The absence of any mention of grocery stores, pharmacies, and parks in resident responses does not necessarily indicate that, in a broader sense, access to these material resources does not influence neighborhood attachment. The extent to which processes like concentrated poverty, environmental racism/classism, and racial residential segregation lead to microlevel concerns regarding identity, cognition, affect, or emotion depends on the extent and manner in which individuals *perceive* these social processes occurring around them, and the extent to which they attribute their disadvantage to themselves (agency) or structural factors (McLeod and Edwards 1995; Christie-Mizell and Erickson 2007; Mirowsky and Ross 1990). Moreover, that this

relationship is not clarified by qualitative responses speaks to the limitations of qualitative approaches in explicating the causal relationships between place attachment and other factors (Scannell and Gifford 2014).

Summary of Findings

My findings demonstrate that residents in multiply-deserted areas can and do have different assessments of their neighborhood that do not align with that of objective, quantitative measures. Despite not having objective access to multiple resources, (e.g., being more than one mile from a grocery store, pharmacy, and/or park), almost half of the residents in the sample reported having access to at least two of these resources in their neighborhood. Additionally, findings indicate that while certain dimensions of objective access (namely distance) are consistent in residents' subjective assessments of access (i.e., perceived access), perceptions of access to grocery stores, pharmacies, and parks were also shaped by the quantity and quality of those resources. Generally, distance is a salient factor in explaining perceived access for concordant residents. Distance was the most relevant for concordant residents when discussing pharmacies, while explanations were mixed among concordant residents when it came to grocery stores and parks. Quantity of resources were the most relevant for discordant residents, especially for places to shop for food and parks. Length of residence nuanced residents' perception of access based in distance, quantity, or quality. These findings highlight the need for more qualitative studies of access that explore not only distance, but quality and quantity of resources and underscore the varied nature of access and spatial inequality. Both the distance and quantity rationales highlight how an important factor, residents' conception of neighborhood bounds, shapes how residents think about what is "in their neighborhood" and what is not.

Moreover, my findings indicate that attachment to the neighborhood centers around the close personal relationships that residents fostered with their neighbors, the former relationships with deceased family members and friends, and the meaningful instrumental and consummatory behaviors residents performed throughout the neighborhood. These factors represent the abstract resources that were salient in residents' prompted expressions of connectedness to the neighborhood: social support, commemoration, place affordances, and social homogeneity. Moreover, place attachment is multidimensional and the distinct dimensions (i.e., affect, behavior, cognition) are often in sharp contrast to one another. That is, a person could have "high" positive affect and demonstrate proximity-seeking/keeping, instrumental, or consummatory behaviors, yet also have ambivalent or little-to-no cognitions, and many other combinations.

Questions arise as to whether these three resources under study—grocery stores, pharmacies, and parks—are salient for residents when directly asked about what their neighborhood needs. Along with other material fixes like better streets, sidewalks, rehabbed homes, small locally owned businesses, and community centers, several residents did in fact mention grocery stores and parks. Because this question about neighborhood needs was asked prior to any questions about actual access or perceptions of access to these three resources, residents weren't primed to think about any of the three resource types. That residents still made mention of grocery stores and parks suggests the importance of these two resource types. However, perceptions of access to grocery stores, pharmacies, and parks did not seem to shape residents' affective, cognitive, or behavioral dimensions of attachment to the neighborhood directly.

DISCUSSION

The present study explores how perceptions of access converge and diverge from objective measures of access commonly used in deserts literature. In addition, the study examines how

variations in perceptions of access to food, pharmacies, and parks in neighborhood contexts relate to resident's attachment to said neighborhood. The findings of this study offer greater insights into the depth and complexity of meaning-making processes people utilize in their conceptualization of neighborhood, access, and attachment to their neighborhood.

The findings related to place attachment are especially poignant as related research has shown that place attachment has significant positive effects on individual mental health and well-being (Scannell and Gifford 2017). Analyzing community residents' descriptions of places they reported having attachment to, Scannell and Gifford (2017) demonstrate several psychological benefits of place attachment, including increased memory support, feelings of belonging, relaxation, and positive emotions. Moreover, these benefits were more pronounced for particular settings, including geographic (e.g., region, neighborhood, locale) and environmental (e.g., parks, rivers) settings. Future research on the relationship between place attachment and mental health outcomes may further illustrate the psychological benefits of place attachment as well as the mechanisms through which resource scarcity impacts health.

Although place attachment varied across individuals, the findings indicate that access to the particular resources under study— grocery stores, pharmacies, and parks— was not as relevant a factor for affective attachment to the neighborhood as other social factors. However, residents' neighborhood evaluations (i.e., how they felt the neighborhood served or benefitted them) were closely related to their access to these essential resource destinations. Residents also often spoke about “pull factors” like more access to retail, entertainment, and jobs as factors as well as “push” factors like crime and infrastructure issues that made relocation tempting. Although outside of the scope of the current study, it is important to note that access to these resources was a relevant factor when residents spoke about daily frustrations related to buying food and medicines, and

when looking for things to do with their children. In addition, access to these resources also became more relevant for residents when discussing neighborhood needs as well as when economically-strapped residents explained the source of their low mental and physical health self-ratings. It could be that residents prioritized other types of resources, like childcare and community centers that offered indoor recreation for children; repaired, walkable streets for individuals, families, and children walking to and from school, work, or the nearby library. As such, making direct, empirical connections between perceptions of access to health-related resources and self-rated health outcomes at the neighborhood-level should be next steps in this area of scholarship.

Future research should explore any gender differences in the meaning-making processes involved in perceptions of access as well as in attachment to place. Related research on the gendered nature of place attachment and mobility in neighborhoods has shown that women report greater place attachment than men and more psychological benefits of place attachment (Hidalgo and Hernandez 2001; Scannell and Gifford 2017). Observed gender differences in place attachment might be due to women's relatively stricter mobility in neighborhoods (due to familial responsibilities, discrimination in employment, and pay gaps) that facilitates a stronger connection to the neighborhoods in which they live (hooks 2009). In addition to exploring how gender might nuance understandings of access and attachment, future research should also explore how heat and climate might mediate individuals' relationship to their neighborhood. Interestingly, some residents considered parks as a resource that they used less in general because of the unbearable heat during summers. Exploring environmental barriers to park use and the trickle-down health effects of climate change and urban heat islands may be next steps in unpacking how the built environment shapes health in urban cities (Kleerekoper, Esch and Salcedo 2012).

Additionally, that all the respondents in the study lived in the same housing project might shape patterns related to place attachment and social relationships. As the housing project is a community of 20+ apartment buildings, each with eight families per building, residents lived in close quarters. This increased proximity to neighbors relative to residents in stand-alone, single family homes might explain the close, often familial relationships residents had with one another that seemingly impacted their attachment to the neighborhood. Moreover, the shared struggle of what residents report as poor management by housing staff might also shape their closeness. Future research should continue in this vein and explore the ways that Black urban city dwellers conceive space and place as well as the various inequalities that operate across the spaces and places in which they live, work, and play. Further, future examinations of place attachment in neighborhoods might benefit from examining this phenomenon using quantitative measures such as the Place Attachment Inventory (PAI)²⁸ (Williams and Vaske 2003). Although qualitative means of measuring place attachment (i.e., in-depth interviews and evaluative maps) provide richer insight into the meanings involving place, these methods might introduce bias via misinterpretation of responses or imbuing meaning to the data (Scannell and Gifford 2014). Thus, a quantitative means of measuring place attachment (i.e., scales) can capture the variation in subjective importance and strength of affective bonds with place among residents.

CONCLUSION

A key feature of this study is that it focuses on Black residents in an urban MDA. This focus is intentional, as the scope of the dissertation is both theoretically and empirically grounded in the continued Black-white demographic binary in urban cities in the southern U.S. Notably, inequality in spatial access to resources disadvantages other racial minorities, including Latinx populations

²⁸ Although included on the survey, this measure was not considered in this study.

and immigrant of color populations in ethnic enclaves (Ortega et al 2016). These neighborhoods often have alternative sources for food outside of the standard food desert measure (i.e., bodegas and other ethnic markets). Future research should examine the complex and unique patterns of resource scarcity across various marginalized social locations as well as over time. This study also begins to attend to the criticisms of the desert literature in general and the quantitative research in this area in particular which asserts that little is known about the quality of resources in neighborhoods and/or residents' perceptions of their access to resources despite what objective measures of this access may indicate. This chapter attends to that criticism while also *not* privileging one resource, but instead focusing on multiple resources. Future research should continue in this vein, building on the work of Reese (2019), Reynolds et al (2020), and Gilbert and Williams (2020) that takes a critical, Black feminist approach to exploring the urban food environment and the coping and sovereignty strategies Black people implement amidst food apartheid. These exemplary pieces of scholarship and the current study make plain that the nature of and solutions to access are indeed in the eye of the beholder.

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Table 1. Demographic Characteristics of Respondents (N=19)

Pseudonym	Sex	Race	Age	Education	Marital Status	# Children	Employed	Car	LOR
Kira	Female	Black	45	HS Diploma	Single	3	No	0	15
Tonya	Female	Black	34	HS Diploma	Single	3	No	0	34
Pam	Female	Black	54	Less than HS Diploma	Single	0	No	0	15
James	Male	Black	50	Some College	Divorced	0	No	0	1
Nancy	Female	Black	29	Bachelor's degree	Single	2	Yes, PT	1	6
Justice	Female	Black	29	Some College	Single	1	No	1	1
Antonio	Male	Black	50	Some College	Divorced	0	Yes, FT	1	1
Delroy	Male	Black	33	HS Diploma	Divorced	0	No	1	30
Phoebe	Female	Black	31	HS Diploma	Single	2	Yes, FT	1	5
Chadwick	Male	Black	48	Less than HS Diploma	Single	0	No	1	48
Mahogany	Female	Black	41	Some College	Single	2	Yes, FT	1	36
Victor	Male	Black	37	Trade Certification	Single	3	Yes, FT	1	10
Gail	Female	Black	33	HS Diploma	Single	1	No	0	33
Monica	Female	Black	27	Some College	Single	1	Yes, FT	1	2
Moe	Male	Black	42	HS Diploma	Single	1	No	0	42
Tabitha	Female	Black	35	HS Diploma	Single	0	No	0	4
Jess	Female	Black	30	HS Diploma	Single	3	Yes, PT	1	5
Vernon	Male	Black	22	Some College	Single	0	Yes, FT	1	10
Heather	Female	Black	24	Some College	Single	3	Yes, PT	1	2

LOR= Length of Residence

FT= Full-time

PT= Part-time

Table 2. Respondent Perceived Access to Each Resource Type (N=19)

Pseudonym	Concordance	Food	Rationale	Pharmacies	Rationale	Parks	Rationale
Kira	Yes	No	Quantity*	No	Quantity	No	Distance
Antonio	Yes	Yes	Quantity*	No	Distance	No	Distance
Tonya	Yes	No	Distance Quality Quantity*	No	Distance	No	Quality Quantity
Delroy	Yes	No	Quantity	Yes	Quantity	No	Quality
Pam	Yes	No	Quality	No	Distance	No	Distance
Victor	No	Yes	Distance Quantity*	Yes	Quantity	No	Quality Quantity
Gail	No	Yes	Quantity*	Yes	Quantity	No	Quantity
Jess	No	Yes	Distance	Yes	Quantity	Yes	Quantity
James	Yes	No	Distance	No	Distance	No	Distance
Nancy	Yes	No	Distance	No	Distance	No	Distance
Phoebe	Yes	No	Quantity	Yes	Quantity	No	Quantity
Justice	Yes	No	Quality	No	Quality	No	Quality
Chadwick	Yes	Yes	Distance	No	Quantity	No	Quantity
Monica	No	No	Quantity	Yes	Quantity	Yes	Quantity
Vernon	No	Yes	Distance Quality	Yes	Distance	Yes	Distance Quantity
Moe	No	Yes	Quantity*	Yes	Quantity	No	Quantity
Heather	No	Yes	Quantity*	Yes	Quantity	Yes	Quantity
Mahogany	Yes	No	Distance Quality Quantity	No	Distance Quantity	Yes	Quantity
Tabitha	No	Yes	Quantity*	No	Distance	Yes	Quantity

Rationale refers to residents' explanations for their perceptions of access to each resource

*Quantity rationale includes alternative food sources

Table 3a. Respondents' Perceived Access x Rationale for Grocery Stores (N=19)

Perceived Access	Rationale		
	Distance	Quantity	Quality
Yes	4	6*	1
No	5	4/2*	5

*Rationales involving quantity included alternative food sources

Table 3b. Respondents' Perceived Access x Rationale for Pharmacies (N=19)

Perceived Access	Rationale		
	Distance	Quantity	Quality
Yes	0	8	0
No	7	3	1

Table 3c. Respondents' Perceived Access x Rationale for Parks (N=19)

Perceived Access	Rationale		
	Distance	Quantity	Quality
Yes	1	6	0
No	5	6	4

APPENDIX

Survey and Interview Protocol

Please fill out this survey. Your answers will be kept confidential. Thank you for your participation.

INTERVIEW CODE: _____

01. What is your gender? Man Woman
02. Select one or more of the following choices to best describe your race.
- | | | |
|---|---|---|
| <input type="checkbox"/> White / Anglo-American | <input type="checkbox"/> Asian / Asian-American | <input type="checkbox"/> American Indian/Alaskan Native |
| <input type="checkbox"/> Black / African-American | <input type="checkbox"/> Latino(a) / Hispanic | <input type="checkbox"/> Other: _____ |
03. In what year were you born? _____
04. What is the highest level of education you have attained?
- | | |
|---|---|
| <input type="checkbox"/> Less than HS Diploma | <input type="checkbox"/> Bachelor's Degree: |
| <input type="checkbox"/> HS Diploma/GED | <input type="checkbox"/> Masters or Professional Degree |
| <input type="checkbox"/> Some College | <input type="checkbox"/> Trade Certification: |
05. Are you currently a college student? NO YES Full time (12 credits or more)?
06. What is your current marital status?
- | | | | | |
|--|----------------------------------|-----------------------------------|------------------------------------|----------------------------------|
| <input type="checkbox"/> Never Married | <input type="checkbox"/> Married | <input type="checkbox"/> Divorced | <input type="checkbox"/> Separated | <input type="checkbox"/> Widowed |
|--|----------------------------------|-----------------------------------|------------------------------------|----------------------------------|
07. How many children do you have living at home under the age of 18 years?

08. Are you currently employed? NO YES Full time (30 hours or more)?
09. If the answer to question 8 is "yes," what kind of paid work do you do? That is, what is the job called (e.g., accountant, electrician, high school teacher)?
-
10. Thinking back over the past three months, how would you say your general health has been?
- | | | | | |
|-------------------------------|-------------------------------|-------------------------------|------------------------------------|------------------------------------|
| <input type="checkbox"/> Poor | <input type="checkbox"/> Fair | <input type="checkbox"/> Good | <input type="checkbox"/> Very Good | <input type="checkbox"/> Excellent |
|-------------------------------|-------------------------------|-------------------------------|------------------------------------|------------------------------------|

11. During the past 4 weeks (28 days), how much of the time did you feel...

...so sad nothing could cheer you up?	<input type="checkbox"/> Never	<input type="checkbox"/> Rare ly	<input type="checkbox"/> Someti mes	<input type="checkbox"/> Oft en	<input type="checkbox"/> Alwa ys
...nervous ?	<input type="checkbox"/> Never	<input type="checkbox"/> Rare ly	<input type="checkbox"/> Someti mes	<input type="checkbox"/> Oft en	<input type="checkbox"/> Alwa ys
...restless or fidgety?	<input type="checkbox"/> Never	<input type="checkbox"/> Rare ly	<input type="checkbox"/> Someti mes	<input type="checkbox"/> Oft en	<input type="checkbox"/> Alwa ys
...hopeless ?	<input type="checkbox"/> Never	<input type="checkbox"/> Rare ly	<input type="checkbox"/> Someti mes	<input type="checkbox"/> Oft en	<input type="checkbox"/> Alwa ys
...that everythin g was an effort?	<input type="checkbox"/> Never	<input type="checkbox"/> Rare ly	<input type="checkbox"/> Someti mes	<input type="checkbox"/> Oft en	<input type="checkbox"/> Alwa ys
...worthle ss?	<input type="checkbox"/> Never	<input type="checkbox"/> Rare ly	<input type="checkbox"/> Someti mes	<input type="checkbox"/> Oft en	<input type="checkbox"/> Alwa ys

12. Each of the twelve statements on this page refers to the place where you currently live, including the neighborhood that you drew? Please check the number on the right that best matches your agreement with each statement.

1=Strongly
Disagree

2=Disagree

3=Agree

4 = Strongly
Agree

A. I feel that this place is a part of me.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
B. This place is the best place for what I like to do.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
C. This place is very special to me.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

D. No other place can compare to this place.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
E. I identify strongly with this place.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
F. I get more satisfaction out of being at this place than at any other.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
G. I am very attached to this place.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
H. Doing what I do at this place is more important to me than doing it in any other place.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
I. Being at this place says a lot about who I am	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
J. I wouldn't substitute any other location for doing the types of things I do at this place.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
K. This place means a lot to me.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
L. The things I do at this place I would enjoy doing just as much at a similar site.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4

13. Thinking back over the past three months, how would you say your mental health has been?

- Poor
 Fair
 Good
 Very Good
 Excellent

So, let's talk about the neighborhood you just outlined on the map. Does this neighborhood have a name? Is _____ the name that everyone calls it?

Ok, so tell me about how long you've lived in _____ and how you became a resident of this neighborhood.

Place Attachment

What is the major reason that you live in this neighborhood? Why do you continue to live here?
How connected do you feel to this neighborhood?
If you could move from this neighborhood to any other neighborhood in this city, would you move?

Where would you move?

Why would you want to move to _____?

Ok, so what kinds of things do you do in this neighborhood?

Tell me about why you do those activities in this neighborhood.

What is your relationship like with your neighbors or the people you know in this neighborhood?

If you had an emergency, would you feel comfortable asking someone in your neighborhood for help? Why/why not?

How has living in this neighborhood positively affected you?

How has living in this neighborhood negatively affected you?

Since you've lived in these neighborhood, how has the neighborhood changed?

Which would you prefer: To fix up your neighborhood/have your neighborhood be revitalized or to relocate? Why?

Stigma

If you had a friend moving to the city, what would you say about your neighborhood to get them to move here?

How do you think outsiders (people who do not live in your neighborhood or city) would describe your neighborhood?

-Why do you think they would describe your neighborhood that way?

If I asked you what kind of neighborhood you live in, what would you say?

Perceived Mobility

What do you think this neighborhood needs or is missing?

If you wanted to move out of this neighborhood to a neighborhood that had these things, how easy or difficult would that be for you?

What factors would make it easier? What factors would make it harder?

Access

How often do you shop for food?

a. Where do you usually go to shop for food?

b. How far is _____ away? How do you get there?

Have you/would you ever walk to ____? Why/why not?

What kinds of food do you purchase at _____?

Would you rather go somewhere else? Why/why not?

How often do you go outside for fun?

Do you go to parks or playgrounds?

Where do you usually go when you want to go to a park?

How far is _____ away? How do you get there?

Have you/would you ever walk to _____? Why/why not?

How often do you take prescription medicines?

Where do you usually fill/pick up your prescriptions? How do you get there?

Have you/would you ever walk to _____? Why/why not?

How often do you take over the counter medicines?

Where do you usually buy these medicines? How do you get there?

Have you/would you ever walk to _____? Why/why not?

Do you think there are enough places to shop for food in your neighborhood?

(no) Why do you think your neighborhood doesn't have enough?

Do you think there are enough places to shop for medicines or fill prescriptions in your neighborhood?

(no) Why do you think your neighborhood doesn't have enough?

Do you think there are enough parks or green areas in your neighborhood?

(no) Why do you think your neighborhood doesn't have enough?

Tell me about the last time you took a walk around your neighborhood or walked to get somewhere in your neighborhood.

Health

In the survey, you noted that your health was a _____ on a scale of 1 to 5. What made you give it this rating?

How would you describe your physical health?

- c. About how many days out of the month do you feel well?
- d. When you are not feeling well, what do you normally do to feel better?

In the survey, you noted that your mental health was a _____ on a scale of 1 to 5. What made you give it that rating?

How would you describe your mental health?

- e. About how many days out of the month do you feel well?
- f. When you are not feeling well, what do you normally do to feel better?

What has been one of the most memorable times you've had while living in this neighborhood?

Neighborhood Maps

Fig. 1. Neighborhood Map

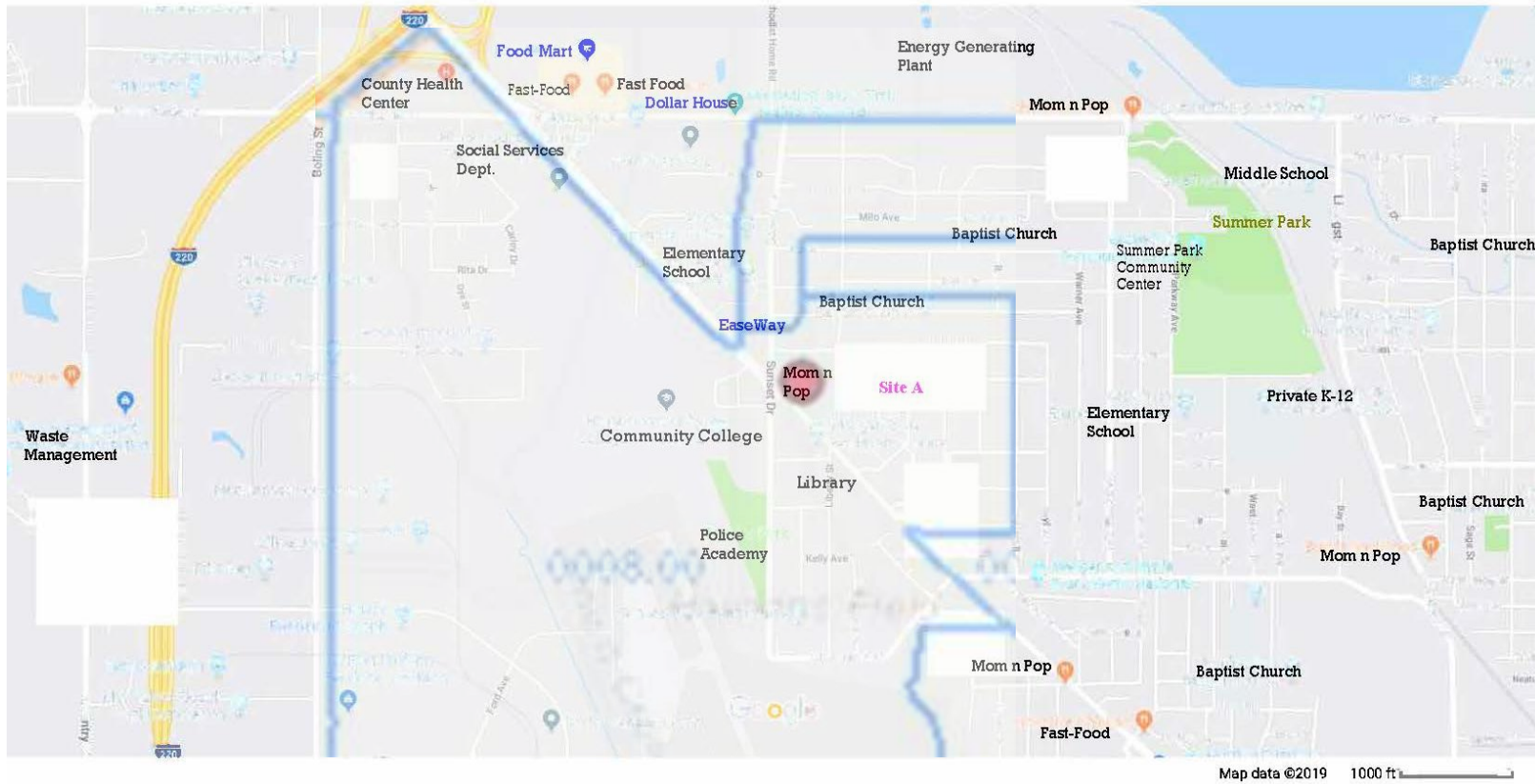
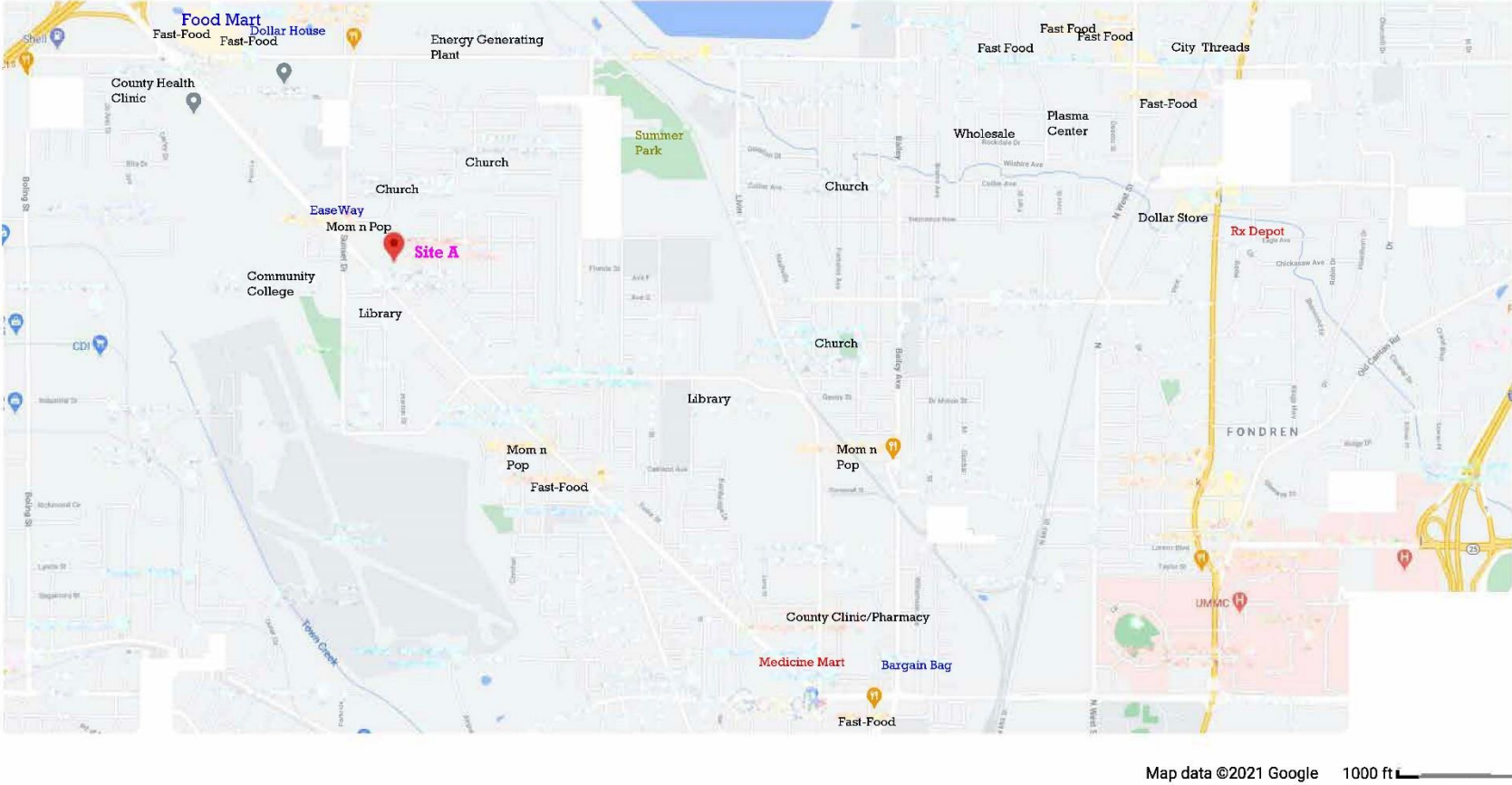


Fig. 2. Map of Resources



CHAPTER V

CONCLUSIONS

The three empirical studies of the dissertation reflect three distinct, yet related, lines of inquiry: 1) intersecting inequality and the built environment, 2) racism and health, and 3) social psychology of inequality. In this dissertation, I investigated how race and class demographics shape the spatial patterning of co-occurring resource scarcity in neighborhoods and the health consequences of living in these multiply-deserted areas (MDAs). MDAs reflect wide-scale disinvestment across urban neighborhoods that create compounded resource scarcity that is lack of access to resources of multiple types. Moreover, I explored differences between objective and perceived access and the impact of perceived access on attachment to place for MDA residents. The goal of these studies was to examine the connection between racism, the built environment, and health in urban, southern cities. The hypotheses and expectations for each study engage literature and theory from various disciplines and add depth and clarity to research on the basis and consequences of spatial inequality in urban spaces. Research on differences in material resources in neighborhoods has demonstrated inequality in the quantity and quality of social, economic, and health-related resources across race and class lines (Gaskin et al 2012; Walker et al 2010; Qato et al 2014). Though this existing research elucidates the racialized and classed ways that access is disproportionate throughout cities, this dissertation contributes a more nuanced understanding of the causes and consequences of disproportionate access to multiple resources as well as an understanding of the lived experience of limited neighborhood-level access and its relation to attachment to said neighborhood.

As one can argue that racism permeates nearly all American institutions, racial discrimination in both its perceived, everyday forms as well as in more objective forms is of

particular interest. Research into the socio-historical foundations of the United States has demonstrated that much of the socioeconomic disadvantage that racial minorities face has to do with patterns of racial discrimination that has had and continues to have social, economic, political, and environmental effects on racial minorities, particularly Black Americans (Wilson 2009). These effects in turn have negative implications for health and life outcomes for Black individuals. One pathway through which racial discrimination affects health at the community level is through racial residential segregation followed by large scale social, economic, and environmental disinvestment resulting in the transformation of once-stable urban communities into resource deserts (Williams and Collins 2016).

Many chronic health problems experienced at high rates by poor racial minorities in urban communities (e.g., diabetes, obesity) are considered ‘diseases of lifestyle’ by health scholars who take a behavioral approach to disease. This approach essentially considers these chronic conditions as effects of individual poor choices and thus preventable through changes in lifestyle while also deemphasizing the role of community and external conditions (Eisenhauer 2001). These assumptions about the unconstrained agency of neighborhood residents—including access to healthy foods and recreation— ignore the ways that the persistent neighborhood decline and disappearance of neighborhood resources²⁹ due to disinvestment places constraints on poor residents in urban neighborhoods. Limited access to the resources that promote health (with simultaneous unlimited access to “resources” that negatively impact health such as liquor stores, fast food restaurants, convenience/ “dollar” stores) diminishes the potential for health in urban communities. Moreover, these and other resources related to food, physical health and health care at the neighborhood level are understudied in terms of their association with individual physical

²⁹ Including public transit and large-scale supermarkets, and health care providers

and mental health outcomes. Many studies of neighborhood disadvantage propose conceptualizations of disadvantage that include resources in conceptual models, but these are deemphasized and usually not operationalized and included in statistical analyses. Other studies include neighborhood environmental characteristics, but these characteristics have included only observed neighborhood disorder and/or observed neighborhood physical deterioration. As such, it is no coincidence that while urbanization/urban renewal grows, the urban poor experience higher rates of morbidity and mortality than their middle-class and suburban counterparts.

In recent years, health scholarship has turned its attention toward the ways in which the built and/or physical environment both directly affect and exacerbate health outcomes for those in urban areas particularly. Although there is a wealth of research in medical sociology literature on neighborhood effects, these studies typically observe more microlevel factors such as social support/social network or macrolevel factors such as crime rates and school district performance or test scores. Less is known about the meso-level factors that encompass the relative impact of neighborhood on individual health. A relatively new line of research has begun to show that risk of diabetes is associated with neighborhood attributes that are also associated with race (Auchincloss et al 2008; Schootman et al 2007). Additionally, Black communities are more likely to be characterized by negative health risk factors (e.g., having food deserts, fewer recreational facilities, lower-quality housing) than White neighborhoods (Kressin et al 2010; Williams and Collins 2016; Zenk et al 2005). These findings suggest the need to further explore the role and importance of space and place in health disparities research.

In this dissertation, I demonstrated that environmental racism, racial capitalism and the stress process are crucial theoretical perspectives in studying the structural causes of spatial inequality and the health consequences of this inequality for Black neighborhoods in particular.

These theoretical approaches clarify both the cause and consequences of the co-occurring, compounded resource scarcity that characterizes multiply-deserted areas. Theories of environmental racism and racial capitalism implicate the discriminatory historical institutional practices and policies that make plain the ways that Blackness and poverty become concentrated in neighborhoods in ways that “mark” them as “Black” or “poor” and thus valueless for environmental goods and dispensable for environmental bads (Bullard 1990; Robinson 2000; Pulido 2000). Consequentially, these theories also help explain how neighborhoods experience persistent disinvestment and become multiply-deserted areas. The stress process model connects environmental racism and racial capitalism (and the consequential lower status of Black and/or poor neighborhoods) with health by providing the grounds by which one can conceptualize meso-level contexts (such as neighborhood factors) as stressors (Pearlin 1983, 1989; Aneshensel 2010). Living in an MDA is a chronic stressor under study in this dissertation. In addition, the Low and Altman (1992) and Scannell and Gifford (2010) conceptualizations of the processes of place attachment (i.e., affect, behavior, cognitions) is helpful to uncover the depth and complexity of the ways in which people in “disadvantaged” neighborhoods nevertheless come to be attached to those places.

Guided by my conceptualization of MDAs and these theories, three distinct research questions about the nature of spatial inequality across neighborhoods and its consequences structure each of the three empirical chapters.

- 1) What is the relationship between race, class, and neighborhood-level resource scarcity?
- 2) Does compounded neighborhood-level resource scarcity impact health and how do race and class nuance this relationship?

- 3) What does perceived access look like for residents in objectively-resource scarce neighborhoods, and how do these perceptions of access shape attachment to place?

Chapter Two assessed spatial inequality (via access to grocery stores, pharmacies, and parks) across 3,011 neighborhoods (operationalized as census tracts) in urban cities across the southern United States. I argued that 1) race and class shape resource scarcity in urban neighborhoods and 2) desert types co-occur and vary according to race and class. My research reveals that nearly one-third of the neighborhoods in the sample are MDAs, while more than half are at least one kind of resource desert. Further, predominantly Black neighborhoods are nearly three times as likely to have more co-occurring resource scarcity than other neighborhoods. My findings also indicate a race and class interaction effect: odds of a neighborhood being a multiply-deserted area increases by 13% as median household income increases if the neighborhood is predominantly Black. In addition, I found that predominantly Black neighborhoods are more likely to be co-occurring food, pharmacy, and greenspace deserts than being singularly deprived as food only, pharmacy only, or greenspace only deserts as well as doubly deprived (i.e., food-green, pharmacy-green, food-pharmacy). These findings have implications for future research on access to resources for other marginalized groups in urban spaces and understanding the various ways that intersections of social identities are associated with access.

Chapter Three assessed how neighborhood-level resource scarcity shaped health across 2,145 neighborhoods in urban cities across the southern United States. I argued that 1) resource scarcity shapes physical health, 2) the relationship between resource scarcity and physical health is moderated by race and class, and 3) the effects of resource scarcity on health vary by type of resource scarcity. I couple Chapter Two data with census-tract level health prevalence data from the Centers for Disease Control/Robert Wood Johnson Foundation 500 Cities dataset. My research

reveals that MDAs have higher prevalence of asthma, diabetes, physical inactivity, and obesity compared to neighborhoods with low or no resource scarcity. In addition, predominantly Black MDAs have higher prevalence of each health outcome relative to non-predominantly Black MDAs, and higher income MDAs have lower prevalence of inactivity, diabetes, and obesity compared to low-income MDAs. The findings demonstrate a need to address racial health inequalities through broader, meso-level interventions.

Chapter Four assessed MDA resident perceptions of access to neighborhood resources and how this shaped their attachment to place. This chapter more clearly and comprehensively articulates urban, southern Black people's perceptions of their neighborhoods and access to resources as well as the emotions, beliefs, and behaviors that facilitate attachment to the neighborhood. Findings indicate that half of the residents in the sample reported having access to at least two resources in their neighborhood despite it being an objectively resource-scarce MDA. Additionally, findings indicate that while certain dimensions of objective access (namely distance) are consistent in residents' subjective assessments of access, quantity and quality of resources also shaped perceived access. In general, distance was salient in explaining perceived access for concordant residents, while quantity was most relevant for perceived access of discordant residents. Length of residence nuanced residents' perception of access based in distance, quantity, or quality. In terms of place attachment, findings indicate that attachment to the neighborhood centers around social support, commemoration, place affordances, and social homogeneity. Place attachment did not seem to be clearly related to perceptions of access to grocery stores, pharmacies, and parks. Rather, perceptions of access to these resources shaped resident's overall satisfaction with the neighborhood. These findings highlight the need for more qualitative studies of access

that explore not only distance, but quality and quantity of resources and underscore the varied nature of access and spatial inequality.

LIMITATIONS AND CONTRIBUTIONS

One of the most glaring limitations of large-scale neighborhood level research on access is that many studies assume that the *closest* neighborhood shops are the stores of choice for residents. Accordingly, such studies fail to examine where people *actually* shop for their foodstuffs. This assumption also ignores many insights gained from literature on store choice and consumer behaviors among disadvantaged groups which has shown that the shopping and travel patterns of low-income consumers are multifaceted and complex. Similar to more affluent shoppers, disadvantaged consumers tend to shop at retail supermarkets located outside their local neighborhood but rely on smaller neighborhood corner stores to supplement their food budgets (Clifton 2004; Gittelsohn et al. 2007; Piacentini, Hibbert, and Al-Dajani 2001).

The dissertation provides theoretical and empirical contributions in several ways. First, the dissertation contributes the concept of multiply-deserted area (MDA), a conceptualization of neighborhoods as sites of co-occurring resource scarcity. This conceptualization recognizes MDAs as neighborhoods in which racial capitalism is manifested as compounded resource scarcity in neighborhoods with a predominantly Black population. These racialized spaces exist as a consequence of ongoing economic, social, and environmental disinvestment both created and sustained by racism and capitalism. Examining neighborhoods as simultaneously experiencing various types of deprivation broadens the way research on neighborhood-level inequality is conducted by positioning neighborhood-level resources as a kind of neighborhood disadvantage.

Second, the dissertation contributes knowledge on inequality and health in urban cities in the southern United States. While research on urban deserts has demonstrated that spatial

inequality is rooted in racism, this research has examined desert neighborhoods in northeastern urban cities, embracing the yet-unfounded idea that southern urban cities experience neighborhood-level social problems in the same fashion as cities in the Northeast and Midwest. Though this may be the case, the lack of comprehensive empirical research on the urban South leaves a space to contribute empirical knowledge on the subject across urban studies. Moreover, the wealth of economic research across the northern-southern divide suggests that the northeastern U.S. is vastly different from the southeastern U.S. in terms of per capita income and economic performance/vitality at the regional, state, and county levels. In addition, the structural and temporal nature of urbanization of urban southern cities is unlike northeastern urban cities, with the northern urban city being both older and denser. Thus, the dissertation provides an examination of the southern urban experience of spatial inequality.

Third, the dissertation takes an environmental justice (EJ) approach to the built environment. EJ studies continue to demonstrate that people of color and people from low socioeconomic class backgrounds are disproportionately exposed to environmental hazards and/or are disproportionately burdened by industry-produced threats to natural resources (i.e., water, landscape). Despite a wealth of research on the way that race and class relate to the burden of environmental degradation in neighborhoods, less attention has been directed to material resources in the built environment (i.e., healthy food destinations, public transportation, parks) from an EJ perspective.

Fourth, the dissertation examines the inequality-health-environment connection in relation to issues of access, health, and attachment to place in urban neighborhoods. Much of the literature examining neighborhood-level contexts and individual health seek to assess whether or not the poverty-health connection exists as an individual phenomenon (in which being poor is both a cause

and effect of poor health), or whether poverty at the community-level impacts health regardless of individual income or socioeconomic status. Individual and community-level poverty and/or socioeconomic measures are highly correlated, as individuals with low socioeconomic status tend to live together in communities in urban cities. Additionally, these communities tend to be under-resourced and/or are sites of economic disinvestment. In today's social and economic urban contexts, formerly impoverished communities are incrementally transformed into sites of economic yield both in real estate and small businesses via processes of upward neighborhood change (i.e., gentrification). Hence, individuals not yet alienated by new residents or pushed out by investors and newly-formed neighborhood associations are situated in contradictory socioeconomic positions. Ecological or aggregate-level measures of poverty status in neighborhoods such as median income, proportion of high school graduates, and proportion of homeowners have dramatically changed, yet residents' individual income and socioeconomic status has not. This unique socio-ecological position and its association with health outcomes has been understudied in medical sociology. Exploring this variation across MDAs was a part of initial plans for this dissertation and is planned for future research.

Fifth, the dissertation takes a geospatial approach to neighborhood-level study of inequality. A geospatial perspective's attention to place and space as important contextual variables about neighborhoods and communities is especially significant for highlighting the social injustices that have and continue to impact historically marginalized communities. Despite its importance, spatial analysis remains an underutilized approach to examining inequality across space in sociological research. Not only is using spatial methodologies important for uncovering standard, objective measures of resource inequality, but attention to spatial processes is also important in reducing bias in analytical findings due to spatial autocorrelation. More specifically,

utilizing spatially-oriented methods such as spatial lag and spatial error models that incorporate spatial effects to avoid bias in parameter estimates are particularly important to account for the tendency of inequality to be concentrated across bordering spaces. This key facet of spatial methodologies is important for linking health data to geographical area to demonstrate health inequality across place. In addition to more finely analyzing inequality across space, the dissertation journeys from addressing larger, macro-level research questions on the patterns of inequality across space and health-related outcomes of this patterning in Chapters Two and Three to more micro-level processes regarding individual perceptions of inequality and access and this relation to emotional bonds with place amid changing neighborhood characteristics in Chapter Four. This integration of macro and micro levels of analysis are important for illuminating the complex, multilevel bearing of multiply-deserted areas on marginalized groups.

Lastly, the dissertation engages theory and methodology from various disciplines in social science that traditionally are disjointed despite their convergence on issues of inequality and health in neighborhoods. Taking an environmental justice perspective to engage theories from critical geography, social psychology of health, and environmental psychology, this dissertation is the embodiment of an interdisciplinary exploration of the inequality-health-environment connection.

POLICY IMPLICATIONS

In addition to the theoretical, empirical, and methodological contributions, the dissertation has implications for policy and community-level intervention. To remedy health disparities related to access to resources, comprehensive policy intervention that increases access to healthy foods *and* greenspace *and* prescription medicines should be considered. At the local level, community initiatives should target low-income *and* higher income Black neighborhoods as findings indicate that access is an issue even for neighborhoods with more economic resources. Moreover, policies

should also help establish procedural equity in neighborhoods by prioritizing grassroots community initiatives that include and empower residents in developing solutions. Further, specific incentives for the development of pharmacies and supermarkets in the form of low interest loans, loan forgiveness or grants might be necessary. Invested parties might also consider non-governmental organizations as sources for the funding, implementation, and maintenance of parks. Likewise, city leaders should develop infrastructure plans that intentionally include greenspaces and safe routes to greenspace including sidewalks. Last, while access to resources that promote health is essential, we should also consider how the increased access to unhealthy foods in poor, urban neighborhoods may shape health and explore how stakeholders can pressure or incentivize fast food businesses and small stores to serve healthier options.

At the national level, expanding access to prescriptions by expanding Medicare Part D and Medicaid so that residents can afford necessary medications is crucial as well as adapting current SNAP food programs to adjust for transportation costs related to limited food access. National policies can also help facilitate access and visibility of current federal programs that allow state and local governments to apply for land grants for the creation, maintenance, and preservation of parks in federally-owned green areas.

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