

FOOD AVAILABILITY IN THE HEARTLAND: EFFECTS OF NEIGHBORHOOD RACE
AND INCOME COMPOSITION

by

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ABSTRACT

Despite ideals of justice and equality, certain segments of the U.S. population are denied the rights and privileges available to the more affluent. This thesis examines the relationships between 1) neighborhood race and class composition and 2) food availability. We explore the extent to which physical and social isolation affects healthy food availability to groups marginalized by race and class. Specifically, we examine the relationship between residential racial and income composition and the availability of healthy foods. We use census tract data from the 2010 U.S. census and 5-year estimates from the 2006-2010 American Community Survey for Topeka, Kansas. For data on food stores we use InfoUSA, a professionally maintained database that provides detailed information on a variety of businesses. We verify this data with various “on the ground” techniques. We conclude with a discussion of the relevance of this work to the knowledge base regarding food environments in the United States.

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CHAPTER 1: INTRODUCTION, PROBLEM STATEMENT, AND RESEARCH QUESTION

This thesis examines neighborhood race and class composition and healthy food availability in a small urban location in the United States: Topeka, Kansas. In fall of 1950 in Topeka, Oliver Brown began walking his young daughter Linda to her first day of third grade at Monroe Elementary. Like other blacks at this time in the U.S., Mr. Brown had become frustrated that he and his children had to walk an inordinate distance to get to the school. The Brown family had to travel 21 blocks to Monroe Elementary, directly passing the all-white Sumner school located a mere 7 blocks from their residence at 511 First Street. Institutionalized racial segregation made this a common frustration for blacks across the country, and the NAACP had approached numerous other parents before this time regarding such inequities. There was nothing about Oliver Brown's background that suggested he would stand up against "the tide of apathy and fear in the black community of Topeka that had accepted segregated grade schools and oppressive economic racism long before Oliver Brown's birth in 1919" (Kluger 2004: 408). It was certainly unforeseen that his name would appear as the plaintiff in the historic *Brown v. Board of Education* case (Kluger 2004: 408). The reasons Oliver Brown stopped at Sumner School that Fall morning in 1950 do not matter. What matters is that he did, and he attempted to register young Linda in defiance of the segregation rule. He was refused, and, under the "forceful guidance" (Kluger 2004: 410) of social activist Esther Brown and pressure from the NAACP, Oliver Brown became the key litigant in the Supreme Court case that would prove to be one of the most important events in the black civil rights movement in the U.S.

Despite this and other efforts for equal rights and justice for all in the U.S., race as well as class segregation remain serious problems that manifest through laissez-faire, social-structural mechanisms (Bobo, Kluegel, and Smith 1997). Also, connections between social class and

structural inequalities have been uncovered by researchers (e.g., MacLeod 1987) and show that in many situations even individuals who possess a racial “advantage” face systematic, structural inequalities. The point here is that these inequalities have not abated since the *Brown v. Board* decision of 1954. USD 501, Topeka’s largest school district then and now, is still segregated by race and class and has only within the last 20 years enacted a desegregation plan (Fisher 2011). Structural social mechanisms still operate to limit the rights and privileges of marginal citizens in Kansas and across the U.S. Physical thus social isolation results in limited availability and access to social resources, food being among the most important because it is universally needed for the most basic biological survival. Ample evidence connects neighborhood race and class composition and a lack of available and accessible healthy food (Chapter 2). Furthermore, connections between poor food availability and accessibility and poor health have been established by numerous empirical reports (Nestle et al. 1998; Cummins and Macintyre 2006; Moore and Diez-Roux 2006; Beaulac et al. 2009; Flora and Gillespie 2009; Schafft et al. 2009; Pampel et al. 2010).

Health outcomes in the U.S. are quickly declining and young Americans are grimly predicted to be the first generation in history unable to achieve a longer life span than their predecessors. Race and class segregation, food insecurity, and a lack of available, accessible healthy foods are serious and intertwined problems in the U.S. By attempting to better understand these dynamics in a location-type that has been until now largely missing from the literature, we hope to contribute to a more complete understanding of these problems, and contribute to solutions to these deeply engrained societal patterns. In the past, neighborhoods and communities did not have to navigate structural impediments to accessing healthy food, particularly those located within or near rural farming areas. Wes Jackson, MacArthur “genius

grant” recipient for his efforts in establishing the Land Institute in Salina, Kansas, can attest to this. In a discussion during a 2012 visit to the Land Institute, he recounted helping with his family farm located in the Kaw Valley, just northwest of Topeka. At this time and place, farmers were able to grow produce for themselves and trade and/or buy from neighboring farms what they did not produce. This household and community food security¹ was achieved largely because farmers at this time and place were able to grow a variety of crops - over 40 different types grew on Jackson’s family farm, including sugar beets and even 15 acres of strawberries. This variety and relative abundance allowed farmers to provide high quality food assistance to other community members who might not have “had the means” to provide for themselves at the time (Jackson, interview, 2012). This kind of community cohesion has eroded. Neoliberalism, the concentration of ownership and economic power in the agriculture and food sectors, agricultural policies and a number of other factors have led to a host of environmental and social problems in rural communities and nearby urban communities alike (Lyson 2004; Bell 2004).

These problems and previous literature pose both 1) theoretical questions: What social mechanisms cause the mal-distribution of healthy foods across U.S. neighborhoods? How do these mechanisms operate? and 2) empirical questions: In a small urban area in the Midwest, are stores that offer healthy foods² (henceforth referred to as *full-service Retail Food Outlets [RFOs]*) unequally distributed across neighborhoods according to race and class? How well do explanations developed in the literature hold up in this context? And, why or why not?

¹ Food security is defined as “access by all members [of a household] at all times to enough food for an active, healthy life.” This includes adequate amounts of available and safe food, and assurance of the ability to acquire desirable food in a socially acceptable manner. If these most basic conditions are not met a household is termed food insecure. (United States Department of Agriculture, Economic Research Service) (USDA, ERS).

² “Healthy foods” are limited to fresh and/or frozen fruits and vegetables. Though there are other important healthy foods like whole grains, the presence of a minimal selection of fruits and vegetables indicates a full service food store that offers the full variety of food necessary for a healthy subsistence.

What is the relationship between residential racial and class composition and the spatial location of stores that offer healthy foods in Topeka, Kansas? To address this question, this thesis will analyze data from the 2010 U.S. Census and 2006-2010 American Community Survey (ACS) estimates. In combination with this data we use the InfoUSA database which provides the location of food stores in Topeka. Together these provide a clear illustration of the distribution of food stores according to race and class in Topeka and Shawnee County Kansas.

Food consumption patterns have been identified as a crucial component in determining an individual's level of health and chances for succumbing to obesity, diabetes, and hypertension (See Chapter 2). In the current economic conditions funding for numerous community services related to health care are being cut. Yet, if programs are able to produce improved health outcomes, it would actually lead to greater cost efficiencies. According to a recent Gallup report (Witters, 2012) *the total obesity costs for the 190 U.S. metropolitan areas surveyed between January and December 2011 is \$80.4 billion*. For Topeka, Kansas alone obesity costs \$109.8 million, and, *if the proportion of obese residents could be lowered to 15%³ the city would save \$60.4 million* (Witters, 2012). This thesis does not claim or provide evidence that food environments themselves cause deleterious health outcomes like obesity. I will argue that healthy food stores are unequally distributed according to race and class and this has serious implications for a marginalized households' ability to procure healthy foods. More difficulty in procuring healthy foods means an added burden in terms of maintaining a biologically healthy diet and reducing one's chance of further difficulties in life that result from preventable, diet-related illnesses.

³This is a realistic improvement according to the Center of Disease Control and Prevention. Regardless, all but three metro areas were above the 15% obesity mark and Topeka earned the unflattering distinction as the eighth most obese metro area at 33.3% (Witters 2012).

Race and Class Segregation in the United States

A legacy of residential race and class segregation continues today in the U.S. despite improvements in civil rights and race relations. Several causal mechanisms are presented in the literature and are explained by a few theoretical orientations. This section will briefly describe theoretical developments that deal with these issues in an effort to bridge this vast literature on race and class inequalities with the literature dealing with food deserts and poor food environments. Food deserts are “areas characterized by poor access to healthy and affordable food (Beaulac et al. 2009: A105, emphasis by authors), and “areas with little or no provision of fresh produce and other health food” (Bader et al. 2010). Food deserts have been linked with residential segregation in the U.S. (Kwate 2008). Although such research efforts have only recently begun to develop and represent a small proportion of the overall “food desert” and food environment literature, they represent an important strand in generally understanding a variety of issues related to inequality and the accessibility and availability of important socially procured goods and services. Food is among the most important of these resources. This thesis attempts to more thoroughly understand the U.S. food desert phenomenon.

Cultural Attributions for Racial Inequality

In the general public and even within recent academic scholarship a “post racialized” view of American society has been emerging (Bobo 2011). Such views fall along a continuum. Most simply and least controversial is the optimistic perspective that the improvements in U.S. race relations seen since the black civil rights movement, most vividly represented by the election of Barack Obama as president in 2008, “signal a hopeful trajectory for events and social trends, not an accomplished fact of social life” (Bobo 2011: 13). More controversial is the view that “black victimology” narratives are waning in salience, meaning that black grievances about

inequality and discrimination today are at best passé and at worst “false assessments of the main challenges facing blacks in a world largely free of the dismal burdens of overt racial divisions and oppression” (Bobo 2011: 13). Another controversial view that has unfortunately gained traction among race and inequality scholars is the diminishing salience of the “black-white divide.” Here, the “level and pace of change in the demographic makeup and the identity choices and politics of Americans” are claimed as key mechanisms that are helping to reduce the ingrained physical and social boundaries between blacks and whites in the U.S. (Bobo 2011: 13-14). William Darity Jr. terms this the “new incorrect Harvard/Washington consensus on racial inequality” in his (2011) article published in the *Du Bois Review*. He takes Wilson’s (2009) book *More Than Just Race: Being Black and Poor in the Inner City* as a prominent example of work in this vein. Wilson (2009) omits wealth in his analysis thus concealing vastly disparate black and white wealth distributions in the process of discounting structural conditions as important causes of racial inequality. As per Darity (2011) “[B]lacks have less than ten cents in net worth for every dollar of wealth held by Whites” (Darity 2011: 474). Cultural factors “have no purchase in explaining racial differences in the three areas highlighted by Wilson: employment and earnings, educational attainment, and family structure” (Darity 2011: 470).

Several studies have demonstrated employer bias against black males (see for example Pager 2003), and that unemployment rates of blacks with some college education exceeds that of whites in the same age range that failed to finish high school (Bureau of Labor Statistics 2011). Added to this, increased educational attainment “does not insulate Blacks from discrimination” (Darity 2011: 471), meaning that even though black Americans go to college at a higher rate than socioeconomically similar whites (Mangino 2010), they are still more vulnerable to discrimination and inequality than whites. With respect to racial differences in family structure –

there basically are none. Even Charles Murray, controversial co-author of *The Bell Curve* (1994) acknowledges in a *National Review* (1986) essay that black and white “illegitimacy” have the same causal factors. Murray, traditionally critical of structural explanations of and solutions to inequality, even warns that differences in family structure are a function of “*class*” not race. Differences in family composition are not a function of racial differences in individual cultural behaviors, but are explained by aggregated social disparities resulting from socioeconomic status which is highly dependent on structural conditions (e.g., economic opportunities, access to education) and other characteristics beyond the control of the individual such as family wealth and the material and social conditions of the neighborhood in which one grows up.

The racial divide between black and white is still very salient today in the U.S. Despite the changing composition of racial demographics, race is an important determinant in levels of discrimination and income inequality, and being black (as compared to other racial and ethnic categories) remains a principal boundary to success despite their enduring presence within U.S. history. Overall, blacks face less discrimination and inequality today as compared to the past, but there remain durable patterns of black-white economic inequality that “are not overcome or eliminated even for the middle class and that still rest to a significant degree on discriminatory social processes” (Pattillo 2007; Bobo 2011: 14-15). New patterns of racial beliefs in the U.S. and historic patterns of racial discrimination are not distinctly southern problems that resulted from Jim Crow and its legacy. These are deep-seated, structural, and national issues. Thus the deleterious consequences of strongly ingrained beliefs and social patterns are also deep-seated and highly structural, and thus difficult to overcome.

Cultural behaviors do not help explain social disadvantage (Darity 2011). The “recrudescence of [this] older outlook” (Darity 2011: 470) is epitomized in President Obama’s

(2008) speech “A More Perfect Union,” which chastises black fathers for failing to take responsibility for their families, chastises blacks generally for falling prey to the psychology of “black victomology,” and chastises black youth for associating success in school with “acting white.” President Obama and others that buy-in to this “Harvard/Washington consensus” fail to take into account the importance of class in determining differential levels of inequality (in terms of employment, earnings, education, and family structure), and differing social and health outcomes This view overlooks the *fact* that class does not mediate patterns of inequality for blacks in the U.S. today (Pattillo 2007; Bobo 2011: 14).

Residential Race and Class Segregation in the U.S.

In order to explain the mechanisms that cause race and class residential segregation in the U.S., I will briefly discuss several theoretical models paying particularly close attention to black versus white racial disparities. The reason for this focus is that the particular context used for empirical analyses within this study, Topeka, Kansas, contains few “global neighborhoods” (Logan and Zhang 2010) or neighborhoods that contain individuals and families of numerous racial and ethnic backgrounds. As such, the black-white racial dichotomy is still prevalent in this location.

Spatial Assimilation, the Place-Stratification Model, and the Locational Attainment Perspective

One theoretical model that has helped researchers understand race and class neighborhood segregation or disparate “minority locational attainment” (Crowder et al. 2006: 73) is the model of spatial assimilation. This orientation shows that racial and ethnic minorities tend to convert economic and human capital into greater physical/residential proximity to the ethnic majority (Massey 1985; Crowder et al. 2006: 73). Why convert capital into moving within closer physical proximity to the racial/ethnic majority? Marginalized racial groups,

American blacks in particular, experience a “double consciousness” (Du Bois 1965 [1903]) in which their interests are split between appealing to the predominate white middle class, and appealing to “little man” blacks (Pattillo 2007). Predominately white and middle class neighborhoods tend to be “higher quality” or neighborhoods that “have a low percentage of families below the poverty level” (Logan 2011: 18); they tend to enable exposure and integration with the majority racial groups and more affluent classes thus providing potential access to more rewarding social networks; they provide less daily exposure to unhealthy behaviors (Cummins and Macintyre 2006; Pampel et al. 2010; Nettle 2011); they offer more accessible and available healthy foods and stores that offer such products on a regular basis (see for example Woldoff and Ovadia 2009: 70); they experience better protection from crime; and they enjoy a better range and higher quality of health services (Woldoff and Ovadia 2009: 70).

Curiously, as of Crowder et. al.’s (2006) publication, most applications of spatial assimilation theory did not take into account wealth as a determinant of residential location. In an effort to fill this void they report the results of a logistic regression analysis using longitudinal data on wealth by race from the Panel Study of Income Dynamics (PSID) and tract-level decennial census data. They find that while wealth disparities between blacks and whites continue to be pronounced, wealth is incapable of explaining “disparate neighborhood locations of black and Anglo families” (Crowder et al. 2006). Despite this criticism, the spatial assimilation model received some general support in earlier years, but it has proved “disappointing in accounting for the residential outcomes of African-Americans and African-origin Hispanics” (Woldoff and Ovadia 2009: 68). Conceptualizations of racial and ethnic composition of U.S. neighborhoods have become more nuanced as a result of the increasingly multi-racial and ethnic character of U.S. neighborhoods. There has been a subsequent

mainstream acceptance of racial and ethnic self-identification and acceptance of officially identifying as multi-racial and/or multi-ethnic. Because of this, conceptualizations of neighborhood race/ethnicity composition demands a complement to the spatial assimilation model in order to grasp the most accurate causal knowledge possible. This complement is found in the place-stratification model.

The place-stratification model asserts that despite economic, educational, or other socioeconomic factors, race/ethnicity “often continues to matter in determining where an individual lives” (Woldoff and Ovadia 2009: 69). Generally in the U.S., race is closely connected with biology, and ethnicity with one’s cultural identification. Race/ethnicity either together as one conflated concept or separated into distinct terms are ascribed characteristics. Disparities in housing and other resources, pinned to these ascribed characteristics as they have been in numerous studies in various locations (see for example Massey and Denton 1993; Pattillo 2007; Logan 2011), illustrate a deep structural cause for the disparate health outcomes and other social disparities that result. These deleterious nutritional, health, and social consequences will be discussed below. Specific socio-structural mechanisms, such as “redlining,” neighborhood disinvestment and the resulting decay of commercial and retail connections as well as the neighborhood infrastructure, “steerage,” “blockbusting,” and subprime lending are all structural (Massey and Denton 1993: 132-182; Pongracz 2004) and “laissez-faire” (Bobo 1997) discriminatory practices that have developed in the wake of decreased overtly racially discriminatory behaviors.

Racist home buying and lending practices coupled with the cultural and physical need for black families to relocate their households in more socially connected and resource-rich neighborhoods are structural forces that maintain and reproduce segregated neighborhood

compositions (Massey and Denton 1993; Pongracz 2004). The locational attainment perspective (Woldoff and Ovidia 2009) draws from both of these orientations. Cultural attitudes and residential tenure patterns that are largely determined by social structure work together to create an environment of residential race and class segregation in U.S. cities.

Invasion, Succession, and Buffering

Labor conditions have provided the material base for residential race and class segregation. In the early 1900s, industrialization and the subsequent move of many blacks from farm to city, and south to north, marked the beginning of black urban segregation in the U.S. Blacks had relatively low wage demands compared to the urban whites of the time and as a result were recruited as strikebreakers (Massey and Denton 1993: 28). This fueled animosity between working class blacks and whites and drove a racial wedge between black and white working class constituents. This began the pattern of U.S. residential segregation and it has been upheld by laissez-faire, socio-structural mechanisms. Thus the “invasion and succession” perspective, developed from early Chicago-school research efforts, holds that as blacks “invade”⁴ predominately white inner-city neighborhoods in search of better economic opportunities, whites move away to neighborhoods on the outskirts of town. Unfamiliar culture, social customs, and ingrained racist attitudes led many whites to feel uncomfortable in their own neighborhoods, and as more and more whites left the inner city more blacks entered. Inner city urban neighborhoods became much blacker in their racial composition (Massey and Denton 1993; Logan and Zhang 2010: 1070).

⁴ The terms “invade” and “attainment” seem to imply that being white and middle class and residing in close physical proximity to them is the ideal situation. These terms, though they might imply a bigoted perspective, instead serve a very “objective” purpose, because white and middle class neighborhoods tend to be areas where high quality food access and availability and positive social and biological/health outcomes are found (see Chapter 2).

Systematic physical thus social isolation guarantees that particular segments of the population are prevented from access to many benefits of modern society. Of particular interest to this study are marginalized households and their ability to procure healthy foods. Economic rationality has led many food stores to relocate to suburban areas in closer proximity to residents with higher incomes. This “grocery store redlining” is well documented by an ever-growing literature and is driven by similar structural mechanisms that cause neighborhood race and class segregation (e.g., racist attitudes and business practices leading to neighborhood disinvestment, residential redlining, “steerage,” “blockbusting,” and subprime lending; concentrations of poverty and affluence resulting from differential levels of black versus white wealth and the white flight from inner-cities in pursuit of higher-paying jobs and better access to other social resources). There are many consequences of residential segregation and inequality – unemployment, poverty, psychological dysfunction, poor schools, low home values, inferior services, and high crime (Massey and Denton 1993: 184). Residing within a food desert or a deprived food environment is perhaps one of the most important because 1) poor services, particularly those that provide healthy foods, appear to result from a confluence of causal mechanisms that lead to neighborhood segregation itself (Kwate 2008); and 2) because of the implications for personal health and length and quality of life that healthy food access and availability have.

Organization of the Thesis

The next chapter illustrates that poor food access and availability has been found to be associated with chronic (and preventable) diseases such as obesity, diabetes, and hypertension. Also, residing within a food desert is not necessarily the result of poor or mal-adaptive decisions. Rather, it is a consequence of deeper social mechanisms and structural conditions that fall

beyond the purview of individual agency, particularly the agency of individuals within marginalized races and/or classes. In Chapter 3, I present a rationale for focusing on Topeka, Kansas. I discuss measurement strategies and other methodological issues pertinent to this study. Chapter 4 discusses my findings in this particular location and how these relate to the burgeoning body of food environment scholarship. The findings and analysis are supplemented by GIS maps found in the Appendix. This project's shortcomings as well as ideas for future research are also discussed. For now let us turn to discuss food deserts in the U.S.

CHAPTER 2 – FOOD DESERTS AND THE U.S. FOOD ENVIRONMENT

Socioeconomic Status and Healthy Food Availability and Accessibility in the U.S. and Other Western Contexts

This chapter will review some key findings from the burgeoning field of food environment scholarship. It focuses on spatial and market-based research which dominate the published literature.⁵ Differing methodologies, conceptualizations, and areas of consensus and controversy will be discussed later. The purpose here is to briefly present differing findings between the U.S., United Kingdom (UK), Canada, Australia, and New Zealand and provide evidential impetus to better and more thoroughly understand the phenomenon of food deserts in the U.S.

Although the term food desert originated in Scotland in the early 1990s and was first published by the U.K. government's Nutrition Task Force (Cummins and Macintyre 2002: 436), it has gained its widespread use and conceptual salience in the U.S. This is evidenced by the massive number of research reports published by American authors (as opposed to authors in the UK, Canada, Australia, and New Zealand) dealing with food deserts (see Beaulac et al. 2009). Food deserts are: "populated urban areas where residents do not have access to an affordable and healthy diet" (Cummins and Macintyre 2002: 436); "areas characterized by poor access to healthy and affordable food (Beaulac et al. 2009: A105, emphasis in original); and "areas with little or no provision of fresh produce and other health food" (Bader et al. 2010). Individuals residing in food deserts are at a disadvantage in terms of mobility and accessibility, are economically disadvantaged, have poor nutrition as they are generally consuming cheaper and

⁵ See Beaulac et al. (2009) and Bader et al. (2010) for systematic reviews of mostly health and nutrition literature dealing with food environment methodology; see Goldsberry et al. (2010) for a critical assessment of three different GIS methods for measuring the food environment or "food/produce accessibility." See Charreire et al. (2010) for a review of studies using GIS methods gathered using social and health science databases.

more filling foods, and are geographically disadvantaged in terms of the number of choices of food stores in their general area of residence (Guy and David 2004).

Beaulac et al. (2009) conducted a systematic review of the literature from 1966 through September 2007. They classified and distilled the number of studies from an initial 106 to a sample of 49 according to country, context, and methodological approach. They reviewed thirty-four studies conducted in the U.S., 5 in the U.K., 6 in Canada, 3 in Australia, and 1 in New Zealand between 1966 and 2007. Reflecting the increasing interest in this topic and related problems, the number of studies conducted within this time-period has skyrocketed: from three studies published in the 1960s, two in the 1970s, two in the 1980s, 12 in the 1990s, to 29 after 2000. They argue that the data is indeed abundant and robust enough to conclude that “Americans living in low-income and minority areas tend to have poor access to healthy food” (Beaulac et al. 2009: A109). Evidence of the existence of food deserts in other countries is “sparse and equivocal” (Beaulac et al. 2009: A109).

Focusing on the effect of socioeconomic differences and health outcomes, Pampel et al. (2010) confirm Beaulac et. al.’s (2009) general findings. Studies on the U.K. and Australia reveal no “socioeconomic differences in food and supermarket availability, nor in fruit and vegetable consumption” (Pampel 2010: 360). In contrast, in the U.S. and Canada there is an association between “obesity and food quality, prices, and availability in a community” (Pampel et al. 2010: 360). Augmenting these findings of disparate access to healthy food according to SES and the association of such poor neighborhood food availability with stratified patterns of diet-related poor health outcomes, (e.g. obesity, diabetes, hypertension) is a copious body of evidence reported in scholarly health and nutrition journals (see for example Nestle et al. 1998; Cummins and Macintyre 2006; Moore and Diez-Roux 2006; Flora and Gillespie 2009; Schafft et

al. 2009). Because race has strong implications for determining SES in the U.S., as seen especially comparing blacks versus whites, there is always at least a minimal association between the presence of racial and ethnic minorities and poor food environments. Morland and Filomena (2007) and Franco et al. (2008) report in the *American Journal of Preventative Medicine and Public Health Nutrition* that access to full service retail food outlets offering fresh and frozen produce is better in predominantly white and higher income neighborhoods than in black, mixed race, and lower income neighborhoods. Within the relatively few supermarkets and grocery stores found in black, mixed race, and lower income neighborhoods, the amount and variety of healthy foods was recently found to be significantly lower than in supermarkets and grocery stores in predominately white and higher income neighborhoods located in large cities (Morland and Filomena 2007; Franco et al. 2008). These patterns are largely found in urban areas, though rural settings have received some attention and similar patterns have been uncovered. Differences in research findings between these types of locations (urban vs. rural) will be briefly discussed next.

Location Types

Large Urban Contexts

The bulk of recent food desert and food environment studies have described the geographic distribution of various types of food stores as well as the selection, quality, and price of different kinds of food found within them in a single large urban area.⁶ There is also research that analyzes customers' and food business proprietors' perceptions of the food environment

⁶ See for example Wrigley et al. (2002) and Leeds, England; Helling and Sawicki (2003) and Atlanta, Georgia; Guy and David (2004) and Cardiff, Wales; Pongracz (2004) and Durham, North Carolina; Moore and Diez Roux (2006) and Baltimore, Maryland, northern Manhattan and the Bronx, New York, as well as Forsyth County, North Carolina [Winston-Salem]; Galvez et al. 2007 and East Harlem, New York; Morland and Filomena 2007 and Brooklyn, New York; Franco et al. 2008 and Baltimore; Zenk 2009 and Detroit, Michigan; Nettle 2011 and Newcastle, England.

(Reisig and Hobbiss 2000 and Leeds, England; Charreire et al. 2010; Zenk 2011). The volume of these types of qualitative efforts is quite limited at this point.

The descriptive data produced by these and other methodologically mixed studies (Wrigley et al. 2002; Nord et al. 2010; Bader et al. 2010; Helling and Sawicki 2003; Whiting and Ward 2010; Thomas 2010) are used to assess the availability and accessibility of healthy foods between differing “neighborhoods” or “communities” according to SES composition of a particular area (measured by median income, wealth, education, job prestige, real differences in household and per capita income, and aggregate income of a particular area). Other indicators of the demographic composition and general characteristics of neighborhoods that have been hypothesized to have a significant effect on healthy food availability include: household size and members’ ages, residential density, median age of the head of household, real differences in consumption patterns (Helling and Sawicki 2003; 71), historical demographic trends in particular areas, residential turnover, population growth, amount of vacant space that could serve as food store locations, and neighborhood location relative to other “types” of neighborhoods. These types of data have also been used to describe the health outcomes of individuals in communities with differing demographic compositions and have established reliable evidence that illustrates systematic and stratified disparities in health outcomes among urban U.S. populations (Lake and Townshend 2006; Cummins and Macintyre 2006; Black and Macinko 2007; Pampel et al. 2010; Flora and Gillespie 2009; Nord et al. 2010). The validity and reliability of key conceptual as well as theoretical issues related to generating useful knowledge on food deserts/environments in the U.S. is discussed below. This will be followed by a chapter describing the case used for this thesis and the rationale for this selection. For the moment it will suffice to note that most research in this area has focused upon large cities with populations of 350,000 or more.

Rural Food Deserts

In a recent Brookings Institution report, Kneebone et al. (2011) show that during the 2000s the number of individuals residing in “high poverty” (20% or more individuals living below the poverty line) or “extreme-poverty” neighborhoods (where 40% or more of individuals live below the poverty line) rose by one-third (Kneebone et al. 2011: 1). Although they focus on metropolitan trends during the 2000s, Kneebone et al. (2011) find that concentrated poverty has been on the rise and the demographics of those residing in these areas are changing. On a national level, the Midwest and South have seen increases in concentrated poverty. Massive rural out-migrations to pursue more lucrative economic opportunities and the influx of immigrants and other economically and socially disadvantaged groups have contributed to increases in non-metro or rural poverty.

Class and race stratification are salient in explaining rural disadvantage. Racial stratification and highly uneven distributions of immigrants to U.S. destinations and physical and cultural isolation coupled with dominating absentee corporate owners makes it difficult for rural populations to access many of the goods and services that are ubiquitous in more affluent communities and neighborhoods. This includes access to healthy foods and health information and services. As food systems have become globalized and more closely follow the neoliberal model, average food store size has risen as has the distance individuals and families have to travel in order purchase food items (Schafft et al. 2009). As a result, a “disproportionate number of low-income people live in areas that have been abandoned by retailing” (Morton et al. 2005). Like inner cities, many rural areas’ food prices are higher, there is less variety, and there is less and a lower quality of fresh produce and meat compared to suburban and urban stores situated within more affluent neighborhoods and communities (Morton et. al.2005: 95). Using the state

of Pennsylvania, as a case, Schafft et al. (2009) found a positive relationship between food deserts and: higher rates of obesity, low-income/high poverty, high unemployment rates, low levels of education, presence of mobile homes and incomplete kitchens, and *rural* locations (Schafft et al. 2009: 164). Moreover, deprived food environments are associated with increased rates of overweight and obesity (p. 165, 171). Despite these convincing findings, race and ethnicity is completely absent from this analysis. This shortcoming, as well as the fact that there is far less food desert research on less populated areas in the U.S. point to a fertile research area that looks more closely at rural food deserts and how race/ethnicity as well as social class interact with the availability and accessibility of healthy foods.

Added to disparities in healthy food access and availability are cultural characteristics that make it difficult to provide food relief to members of some rural communities. In a 2010 article, Whiting and Ward show that in economically vulnerable communities that are traditionally reliant on a small diversity of industry for employment and that are likely to experience food insecurity, federal food assistance is eschewed because of economic and transportation restraints as well as socio-cultural norms that are opposed to such outside assistance (Whiting and Ward 2010: 501-502). Although this piece provides excellent information on barriers to relieving food desert symptoms in one rural community, few others tackle such issues (Morton et al. 2005; Schafft et al. 2009).

There is a dearth of explicit information on the historical and cultural causal mechanisms that have led to the relative “food desertification” of the U.S., particularly in rural contexts where populations have experienced disproportional amounts of poverty compared to urban populations and where, paradoxically considering the agricultural tradition of rural America, available and accessible healthy foods are relatively scarce. Added to this, traditional means of addressing

food insecurity, such as the Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps) and WIC (Women, Infants, and Children - food vouchers provided to impoverished mothers) cannot be used if there are no grocery stores within a reasonably accessible area. Furthermore, such food assistance strategies often do not match up with rural sensibilities regarding the acceptance of outside assistance, signaling the need for new and more integrative, holistic, creative, and context-specific food policies (Lang et al. 2009). Besides resistance to accepting food relief as it is administered under current policies, there are economic limitations such as a lack of communication technologies, and a lack of transportation, both of which are particularly common in rural settings (Whiting and Ward 2010: 501-502). Race is also curiously absent from research that addresses the deleterious symptoms of rural food deserts, although ethnicity has become a salient research issue as streams of immigrants have been diverted to rural communities by agricultural employers and particularly in recent decades by large, multi-national meat processing firms (Stull 1995; Broadway 2007; Barr 2008; Martin 2009).

Smaller Urban Contexts Within Largely Rural Regions

Research dealing with urban areas with populations of less than 350,000 has focused on consumer perceptions of the distance they must travel to food stores and how this varies by the levels of household food insecurity (Duvall et al. 2010; Goldsberry et al. 2010; Thomas 2010). There is limited data collection and discussion on race and/or ethnicity. Thomas (2010) finds that distance, as reported by food customers, was the most influential variable in terms of affecting choices of where to shop for food insecure households (p. 407). Goldsberry et al. (2010) and Duvall et al. (2010) focus on the reliability of “nutritional terrain” measurements (Goldsberry 2010). In one study the researchers test three different methods of calculating

food/produce accessibility; container method, weighted method, and cumulative distance method (Goldsberry et al. 2010: 490-493). In another, the authors show that physical similarities between food stores (e.g. supermarkets, convenience stores, and generalist grocers) do not necessarily mean similar food selection (Duvall and Howard 2010). “Ground-truthing” secondary data on food store locations by physically enumerating products within particular food store locations and physically identifying stores within a neighborhood or other level of measurement is the only way to guarantee an accurate and nuanced picture of food availability (Duvall et al. 2010: 536; Powell et al. 2011).

Overall, research on smaller urban areas has produced some very useful findings, particularly in regard to methodology. In the limited research on these types of locations, explicit connections between SES, race, and food availability have not been firmly established. Thomas’s (2010) finding that distance to food stores factors heavily in food insecure households’ decisions on where to shop, however, provides a valid connection between objective geo-spatial characteristics and its effect on food shopping behaviors. Counterintuitive to this is the finding that consumers do not always shop at the closest store (Thomas 2010: 406). This provides clear empirical evidence that physical proximity is “being balanced against other factors and is not the only concern influencing primary store choice” (p. 405). Thomas’s (2010) combination of survey and GIS methods allows for an overall quantitative description that is sharpened by a qualitative explanation. This mixed-methods approach appears to be the most appropriate in addressing such multi-faceted problems that surround the causes and consequences of food insecurity (Kelly et al. 2011).

Conclusion

SES and race disparities are found in all types of locations, though research is lacking in small urban areas (population of less than 350,000). One could argue that this focus is justified because of the huge proportional difference between the number of people residing in large cities like New York and Atlanta versus smaller contexts like Topeka, Kansas or other Midwestern cities that have populations of less than 300,000 (e.g. Cleveland, Ohio, Lexington, Kentucky, Cincinnati, Ohio, St. Paul Minnesota, Lincoln, Nebraska, and numerous others). But, the fact that such smaller contexts are *numerous* in the U.S. means there are a large number of Americans living within such contexts as compared to the larger urban contexts which, so far, dominate in terms of research attention.

Research efforts in this field are admittedly undeveloped and nascent (Beaulac et al. 2009; Goldsberry et al. 2010). Research methods have been advancing though there has been little measurement consistency and little to no generalizable knowledge that has resulted from these efforts (Glanz 2009: S96). Findings in this field cannot yet illuminate causal mechanisms in different locations other than the particular type(s) dealt with in particular studies. Theory is largely absent from this literature. Despite these shortcomings, these studies have produced invaluable descriptive knowledge that can inform such causal and theoretical studies. This thesis argues that because of the serious nature of the problems that are associated with food deserts and poor food environments, and the intense research attention and development that has occurred around these topics, it is time to address the fundamental, structural causes of food deserts so the problem can be more deeply understood and hopefully more effectively remedied. The next section will discuss the consensus and controversy in this field with an eye toward methodological and theoretical strengths and weaknesses.

Food Environment Methods and Theory

Since this particular field is still in early stages of development, most research is descriptive, reacting to and describing problems instead of elucidating and attacking causal mechanisms. Neighborhood racial composition and SES disparities are generally associated with poor food environments in all types of U.S. locations, although specific information on smaller urban areas is lacking. How have researchers come to these conclusions? What concepts are used, how are they measured, and what is their significance in understanding and systematically addressing disparate levels of available and accessible healthy foods according to race and class? What do food environment researchers agree and disagree on, and what is significant about the consensus and controversy that has arisen among food environment research?

Classifying Store Types: Secondary Data on Store Locations and Food Selection

In most research, data on food availability is obtained based on store types. Especially in studies that examine large urban areas, the number of different types of stores and the relatively vast geographic area in which they are located has made researchers reliant upon secondary data sources provided by firms like InfoUSA and Dun and Bradstreet (D&B) that specialize in maintaining current data on various types of businesses. Two problems stem from this methodological approach: 1) Does classifications of food stores represent an accurate proxy for the *types* of foods offered by each type of store? and 2) How accurate are the lists generated by these firms? The manner in which these difficulties are handled will have serious implications for any conclusions that researchers reach. Food store “access” or “availability” is the dependent variable in most food desert studies. In order to accurately describe such disparities, the number and “quality” of stores and availability and accessibility of healthy foods in a given geographic area must be conceptualized in a clear, accurate, and meaningful manner.

In the U.S., food stores have been uniformly classified using the Standard Industrial Classification code (SIC code) and also by the North American Industry Classification System (NAICS) since 1997. These codes provide a fairly consistent method for identifying the major products offered by each type of store. In their review article dealing with the validation of secondary commercial data sources on retail food outlets, Powell et al. (2011) present the following food outlet classifications:

Specialty food stores: bakeries, meat or fish stores, fruit or vegetable stores, candy or nut stores and coffee and tea stores.

Convenience stores: non-specialty food stores with two or fewer cash registers, no fresh meat and fewer than ten varieties of fresh fruits and vegetables.

Supermarkets: stores with a minimum of four cash registers, fresh meat, at least twenty varieties of fresh fruits or vegetables and at least two of the following features: butcher, deli or bakery.

Grocery stores: food stores that were not a specialty food store, convenience store, or supermarket (p. 1125).

These classifications are certainly not arbitrary, and are based on a systematic review of literature dealing with “retail food outlets” and data on outlet characteristics gathered by field workers from the inside of stores (Powell et al. 2011: 1125). Data on grocery stores and supermarkets are in the best agreement with the “ground-truthed” reality (Powell et al. 2011: 1127) compared to data on specialty stores, restaurants, and fast food outlets although the sensitivity of agreement was relatively low (46% for D&B; 54% for InfoUSA; Powell et al. 2011: 1127). The poor agreement between specialty stores and restaurants is dismissed as unimportant because grocery stores and supermarkets are most important for nutrition and obesity related studies (Powell et al. 2011: 1130). This illustrates an important oversight regarding specialty stores – although these types of food outlets do not offer the complete variety of food and nutrition one needs, they are significant locations for procuring food because they

offer “distinctive selections of produce items with strong social and cultural meanings” (Duvall and Howard 2010: 536) and are infrequently included in food environment research (Duvall and Howard 2010: 536).

Coupling secondary data sources and on-the-ground observations of product variety and quality, enumerating products (Duvall and Howard 2010), using internet resources, phone books, and current and historical health department listings (Powell et al. 2011: 1130) will allow researchers to validly operationalize healthy food availability/accessibility. These techniques will help provide an accurate proxy for the types of foods offered in each type of store and to validate the accuracy of secondary commercial data sources. The problem with this validation process is it is very labor intensive. This would be especially true in larger urban environments that can contain thousands of stores, many of which frequently close and change locations. The continued development of this field and its ability to fully understand and address the problems associated with food deserts will partly rely on the manner in which this measurement difficulty is addressed.

Food Availability vs. Food Accessibility

While describing food environments, researchers most often use the concept “food accessibility” although “food availability” is also interchanged, and Goldsberry et al. (2010) prefer “nutritional accessibility.” Any study should explicitly define their use of either concept. Despite their common use, such explicit definitions are largely missing. Goldsberry et al. (2010: p. 487) direct readers’ attention to environment and planning literature for an explicit conceptualization. Handy and Niemeir (1997) define accessibility as made up of three components: “the spatial distribution of potential destinations, the ease of reaching each destination, and the character of each destination” (Goldsberry et. al., p. 487). Applied to food

environments, measurements of accessibility must account for the “spatial arrangement of food retailers, the costs of travelling to any retailer and the foods *available* at each retailer”

(Goldsberry et al. 2010: 487; my emphasis).

As mentioned above, GIS methods have become increasingly common in these types of studies. They have major advantages, like measuring the food environment without using relatively arbitrary administratively defined geographic areas. Instead, GIS software allows researchers to estimate the density of outlets and quantify the distance from each individual residence to all types of food stores (Charreire et al. 2010: 1782). A significant disadvantage to this approach is an overly objective and ecological view of food accessibility because of this approach’s exclusive reliance on secondary, quantitative data. This results in mechanical definitions that may have little agreement with individuals’ perceptions and practices (Charreire et al. 2010: 1782) and/or the true distribution of food stores and the distribution of healthy foods that this implies, hence the importance of on-the-ground corroboration.

Whether researchers use the terms food or nutritional “availability” or “accessibility,” they must provide an explicit definition of the most appropriate term in order to establish some continuity between research that occurs within numerous disciplines and is published in a diversity of scholarly journals (although there is relatively little cross-referencing between disciplines). “Food availability” as I use it here refers to the mere presence of fresh and/or frozen fruits and vegetables within neighborhoods.

The underlying concern motivating all of this research is food security. Food security is defined by the United States Department of Agriculture’s (USDA) Economic Research Service (ERS) as “access by all members [of a household] at all times to enough food for an active, healthy life.” This includes adequate amounts of available and safe food, and assurance of the

ability to acquire desirable food in a socially acceptable manner (USDA, ERS, 2012). If these most basic conditions are not met a household is food *insecure*.

While hunger and mal-nutrition are more dire consequences of food insecurity than, for example, food consumption behaviors that likely lead to deleterious health outcomes like obesity, heart disease, or diabetes, inaccessible and unavailable healthy food is a salient problem in western, post-industrial nations, particularly the U.S. and locations within the Midwest U.S. where there tends to be more poverty (Logan 2011).

Physical V. “Social” Barriers to Healthy Food Availability

What determines the type of food store that individuals are most likely to visit when buying the bulk of their household’s food? In other words, what characteristics make stores most attractive and accessible to particular individual consumers?

Physical Proximity – The Most Objective Measure of Food Availability

Most GIS studies, the bulk of food environment research, use objective measurements of the food environment in order to describe the availability and accessibility of healthy foods. Charreire et al. (2010) characterize these measurements as being either proximity or density methods. The proximity approach “assesses the distance to food outlets by measuring distances or travel times.” The density approach “quantifies the availability of food outlets using the buffer method, kernel density estimation or spatial clustering” (Charreire et al. 2010: 1773). The advantage of this is that it allows researchers to measure food environments without using sometimes arbitrarily defined administrative areas like census tracts or blocks⁷ (Charreire et al. 2010: 1782). Many stores are located on the borders of administratively defined areas as are many residences and researchers must use creative controls to account for the fact that the

⁷ Although there are ways to supplement counts of food stores within, for example, census tracts to provide a more accurate count of available and/or accessible stores. More on this below.

distance from one residence to a particular kind of food store in a different tract or other administrative unit could be shorter than the distance to a store *within* an administrative unit. Also, individuals do not always shop at the closest store in terms of physical distance (Thomas 2010: 406). An increasing number of qualitative studies reveal the importance of balancing objectively defined physical proximity against other more subjective factors.

Subjective and other Non-Geographic Determiners of Food Buying Behaviors

Zenk et al. (2009) find that healthy food intake is associated with the presence of a large grocery store in the “immediate neighborhood” and *not* the objectively defined distance to stores. These findings stem from block-level data in Detroit, Michigan. Zenk et al. (2009) provide survey data regarding individuals’ reported strategies for obtaining food and their fruit and vegetable intake within a particular neighborhood. However, the presence of a large grocery store is certainly no guarantee of better health and higher levels of healthy food intake.

In a March 2012 article for *Grist* (grist.org), Tom Laskawy cites research from the *American Journal of Preventive Medicine* and the *Archives of Internal Medicine* that fails to illustrate a “link between proximity to supermarkets and healthy eating” (Laskawy 2012: 1). These types of “null findings” are often not reported or are ignored by policy makers and the media. While important to acknowledge this inconsistency in food environment research, concerns about the abandonment of marginalized neighborhoods by food retailing goes back decades (Laskawy 2012: 2) and is a serious problem that deserves concerted attention by researchers, policy makers, and activists. It is important to note here that the problems and social mechanisms associated with poor food accessibility and availability, consumption of low quality foods, and poor health are complicated and intertwined. The types and severity of problems varies by context.

In a later article, Zenk et al. (2011) provide evidence of social/subjective barriers to obtaining food (p. 290). Here, women in a poor and predominantly black neighborhood report multiple environmental barriers to obtaining food: material, economic, and social-interactional (p. 290). Dealing more specifically with healthy behaviors, which include buying and preparing healthy foods, Pampel et al. (2010) review sociology, economics, and public health literatures and identify nine categories of causal mechanisms regarding healthy behaviors (p. 353-362). The authors attempt to formulate an overall theoretical framework, though, it is admittedly difficult because the “literature has done little to systematically compare/contrast mechanisms” (Pampel et al. 2010: 362).

Regarding food desert literature more specifically, an over-reliance on quantitative case studies, and a reluctance to use “shoe leather” (Freeman 1991) and qualitative research (Oakes et al. 2009: S178) has resulted in an exclusive reliance on reliability at the peril of validity in measurement strategies (Oakes et al. 2009: S180). More efforts toward theoretical integration between different disciplines, validity testing and falsifiability efforts, and more focus on conceptual and theoretical thinking will improve the explanatory power of literature dealing with food and healthy behavior environments and the theory(ies) that develop around them (Oakes et al. 2009).

Travel Burden

Vehicle ownership, available and accessible public transportation, and safe neighborhoods are important conditions for determining access to healthy and affordable foods. These are resources that make other resources available, healthy and affordable food being the most important because of the universal need for its constant access. With a sprawling infrastructure and disparate geographic distribution of resources, access to transportation

resources determines the quantity and quality of accessibility to important social goods in the U.S.

Bader et al. (2010) combine physical proximity measures of healthy food access by race/ethnicity and neighborhood poverty levels with measurements of social barriers. This article, published in *Economic Geography*, represents a rare effort to develop an integrated methodological framework, although the “social” barriers included could also be conceptualized as indicators of “physical proximity accessibility.”⁸ Their “social barrier” measures include: vehicle ownership; accessibility by walking, subway, bus, walking or transit (p. 420); neighborhood homicide rates (p. 421); and expressway density and traffic accident density (p. 422). While these are important resources to own or have direct access to in order to provide accessibility to other crucial social resources, they fail to capture neighborhood residents’ subjective perceptions regarding healthy food accessibility.⁹ Regardless, when adjusting for traffic safety and small retailer access, Bader et al. (2010) find that disparities in access to food stores tended to decrease (p.424) and that failing to account for indicators of “travel burden” between advantaged and disadvantaged communities could mask disparities in food access (p. 424). Notably, in this particular analysis focusing on predominantly black neighborhoods in New York City, black neighborhoods have the lowest access to healthy foods *regardless of adjustments for their travel burden* (p. 424).

⁸ The term “social” is misleading here I believe. I prefer measures of healthy food availability and accessibility as falling somewhere within an ‘objective-subjective’ continuum. I believe this to be a more clear and explicit conceptualization: objective refers to mechanically and rigidly measured quantities of things with a “bird’s eye,” ecological perspective, and implies quantitative data analyses; subjective refers to perceptions and meanings created and maintained by actors within food environments and implies qualitative data analyses. This conceptual “mix-up” is illustrative of the theoretical neglect found within the literature (Oakes et al. 2009).

⁹ Not to mention consumers’ subjective perceptions on “healthy food” itself.

Inconsistent Measurements

Several studies have examined the differing output that various methods produce (predominantly geographic/spatial) (Cummins and Macintyre 2006; Beaulac et al. 2009; Goldsberry et al. 2010; Kelly et al. 2011; Powell et al. 2011). Beaulac et al. (2009) identify two different ways to approach food deserts and the “deprivation amplification” (p. 5) that results: a form of spatial inequality “whereby area-level deprivation compounds individual disadvantage” (p. 2), and, a market-based perspective that focuses on the prices of food items and how they differ according to location. Research using spatial methods has already presented robust and abundant evidence of deprivation amplification. Market-based approaches have yielded mixed results (Beaulac et al. 2009).

Kelly et al. (2011) advocate for more multi-dimensional approaches that identify food outlets and that look closely at the food products sold within these outlets (p. 1291). They also warn, similarly to Bodor et al. (2010), that some measuring tools capture unnecessarily complex and detailed information and this can often make facilitating understanding among the most important and involved segments of society more difficult. These constituencies are important in terms of affecting positive social change and include the public, researchers involved in extension, and activists (Howard 2009). Such unnecessarily complex data are also weak at identifying “on the ground” intervention points (Kelly et. al., 1291). Maps can improve clarity and organize a great deal of information into one easily understood page or series of images (Howard 2009).

Cummins and Macintyre (2006) briefly review abundant research that shows the relationship between income inequality and health in the U.S. Their review also reports that these same types of relationships have not been uncovered in western European contexts,

although most of this research uses cross-sectional data and most work has been done in the U.S. (p. 102).

Causal relationships and processes are most likely more dynamic than what can be captured with cross-sectional data. Research is emerging that utilizes historical and other types of data that get at socio-cultural and other mechanisms that have developed throughout history that are associated with unhealthy food consumption and food deserts (see for example Dunkley et al. (2004) and Whiting and Ward 2010). Standardized measures, clear and explicit concepts (Glanz 2009), and a synthesis of valid methodological approaches (Kelly et al. 2011) will help push this burgeoning field past largely descriptive accounts of food deserts into critical explanations that can uncover causes thus help produce more effective interventions.

Causation and Theory

The literature to date is largely atheoretical and focuses on measurement reliability at the peril of validity (Kelly et al. 2011). Particular knowledge of particular locations and contexts is abundant, but there is little to no explicit theoretical and logical connection made between particular and general knowledge. Without this theory-informed connection between the particular and the general, the body of work thus far has not given itself a chance to develop theoretical knowledge on causal mechanisms that operate in a variety of locations. These research efforts have only been able to inform *reactive* policy and activism. As more focus is put upon the underlying causal mechanisms that operate generally across food deserts in the U.S., policy and activism will be able to more effectively take action to remedy the fundamental inequalities that have solidified the pattern of disparate levels of food access and availability within U.S. neighborhoods.

This study is meant to be the groundwork for a “mixed methods” approach that combines quantitative and qualitative data analyses utilizing the strengths and accounting for the various weaknesses of previous research endeavors. One of the difficulties of this mixed approach is that examples of “on the ground,” inductive approaches are limited in regards to food insecurity issues. But there exists a long line of qualitative and ethnographic research that has led to great insights on how and why individuals make sense of their everyday experiences and the socio-structural significance of such decisions (see for example: Geertz 1973, Becker 1982, Macleod 1987). Some even deal directly with the food environment and healthy food movements (e.g. Johnston and Baumann 2009).

The goal is to produce general knowledge about the consequences and perhaps more importantly the *causes* of food deserts and the mechanisms that reinforce them in the U.S. through a nuanced understanding of particular contexts and the individuals within them. This thesis argues for a causal, theoretical, ‘preventative’ approach to food deserts as opposed to the largely (and necessarily because of the relative newness of such studies) reactive research efforts thus far.

Conclusion

Neighborhood racial composition and SES disparities are generally associated with poor food environments in all types of U.S. locations, although specific information on smaller urban areas is lacking. There are a few generally agreed upon methodological approaches in regard to understanding food environments. Most researchers rely on the type of food store as a proxy for the “quality” of foods or the presence of healthy foods. Data on food store types is usually procured via secondary sources. Despite this methodological dependency, there is a growing awareness of the importance for researchers to verify secondary data on the ground.

GIS mapping and statistical software has become increasingly common as researchers have benefitted from its capabilities of generating easy to present illustrations with large amounts of quantitative data. The problem is that this technique has placed a large amount of attention on measurement reliability and taken away focus from the broader historical context that U.S. food deserts are embedded within. This has led to the development of research that mainly concerns itself with the validity of questions and problems pertaining to particular contexts at specific times. The literature thus far has provided a valuably informative cross-sectional perspective of food environments. Evidence and explanations of the causes cannot be made explicit without a combination of methodological approaches.

CHAPTER 3 – METHODS, DATA, AND STUDY SITE

The reason for many of the above highlighted methodological shortcomings is that it is impossible to include everything in one particular study. A more explicit theoretical orientation would help situate future research within a framework that would be informative with respect to the most important indicators on what type of data to collect in each particular situation or context. This lack of an explicit theoretical orientation stems from a dearth of work that includes the historical socio-structural mechanisms that have caused the present disparate state of the U.S. food environment.

A historical and comparative analysis of Topeka, KS and the causal mechanisms that have led to the present condition of the food environment is beyond the scope of this study. Also, time and resources have not allowed for the collection of qualitative data in the form of questionnaires and interviews. This study is unable to illustrate the ideal mixed methods approach that it espouses. So, the goal of this study is to provide a broad quantitative illustration that can inform a historical analysis that includes qualitative data collection. This will allow for a richer and more nuanced illustration of a particular food environment and will provide evidence that will either support or refute the hypothesis that social mechanisms that cause and reinforce residential segregation also contribute to poor food access and availability for marginalized races and social classes. It will also lead to insights regarding *how* these mechanisms operate and how particular segments of the population navigate them (or not) on their way to purchasing, preparing, and consuming healthy foods.

Again, the theoretical research questions guiding this analysis are: what social mechanisms cause disproportional distributions of healthy food products within U.S. neighborhoods? How do these mechanisms operate? The empirical questions are: in a small

urban area in the Midwest, are stores that offer healthy foods (henceforth referred to as *full-service Retail Food Outlets [RFOs]*) unequally distributed across neighborhoods according to race and class? How does the generalization that “Americans living in low-income and minority areas tend to have poor access to healthy food” (Beaulac et al. 2009: A109) hold up (or not) in this context? Why?

Why Topeka?

Topeka, Kansas is a strategic case for addressing these questions for several reasons. In this section I present a methodological and theoretical rationale for this selection and support it with descriptive statistics from the 2010 U.S. Census and 2006-2010 American Community Survey (ACS) estimates. Following this I present a visual synthesis of data on the significant variables that have been discussed in relevant literatures and their association with the availability of healthy food within neighborhoods in this small urban location.

Establishing the Food Desert Phenomenon in Topeka, Kansas

Location Type and Context

Topeka represents a relatively small urban context. With a population of about 127,000, it is far less populated than larger urban contexts analyzed in much of the literature. As discussed above, the relevant unit of analysis within cities and towns is the neighborhood as it is the unit of physical and social space most immediately surrounding an individual and a household.

U.S. Census tracts provide a proxy for neighborhoods. Past studies have often included only the census tract within which someone lives as a measure of “neighborhood.” Following the lead of Logan (2011), I will use the census tract plus each adjacent tract in order to determine the number of full service RFOs in each “neighborhood.” This will add validity to this measure

as many people, even those in poverty, travel to neighboring tracts to procure resources. This is especially true of residents who live near to or on the border of neighboring tracts.

The borders of census tracts are relatively arbitrary though convenient for “neighborhood”-level analyses and certainly serve as an adequate proxy for the geo-spatial area most convenient to navigate by those individuals who reside within them (as well as the tracts immediately adjacent). Census tracts contain 3,000 – 4,000 people and are designed “to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions” (U.S. Census Bureau).

How to measure food availability and/or accessibility?

Food *accessibility*, or the ability for consumers to access stores and healthy foods, is not directly measured. Since I will be recording the number of valid food stores within each census tract or neighborhood and adding this number to the total healthy food stores in adjacent tracts, transportation and other *accessibility* issues will not be as salient. Food stores within one’s census tract should be fairly accessible with or without automobile access or other transportation arrangements. For this project I am simply measuring *food availability*, or the mere presence of full-service RFOs. This measure indicates the number of stores that offer a selection of fresh and/or frozen fruits and vegetables, which I am using as a proxy for healthy foods.

This minimal healthy food selection is first indicated by the type of food store: Grocers-Retail, Wholesale Clubs, Food Products-Retail, Food Markets, and Fruits, Vegetables and Produce. The locations, SIC codes, store classifications, as well as a host of other information regarding “food stores” were purchased from InfoUSA. Besides these store types, data on several other store types that often sell food products was gathered. These are: Convenience Stores, Service Stations-Gasoline and Oil, Cigar Cigarette and Tobacco Dealers, Sausages/Other

Meat Products Manufacturers, Meat-Retail, Seafood-Retail, News Dealers, and Department Stores (see Appendix A). Including these store types in the data purchase ensures that not a single store that might sell fresh and/or frozen produce was excluded from the final analysis. These stores that do not *certainly* sell fresh and/or frozen produce were “truthed” several ways: via telephone, a google maps search, by driving through the main thoroughfares of the tract in question and verifying the presence of stores and the quality of the food selection within them, and, from personal experience.¹⁰

A major advantage of this relatively simple indicator of healthy food availability is that it serves as a *distance* control, meaning that it easily indicates the amount of healthy food available within the shortest physical proximity. This measurement can do this without the use of GIS. Also, it indicates the *density* of healthy food availability. Especially within inner city tracts that are quite uniform in size, distance from food stores and the density of available healthy food is accurately captured by what could be viewed in other cases as arbitrary “neighborhood”/tract borders (see Appendix B for a map of Topeka broken into its 43 census tracts – note the relatively uniform size of the tracts that surround the city center).

Food *variety* is not available via secondary data sources. It is beyond the scope of this study to enumerate the various types of food available in each food store within each census tract. It is not the concern of this study to determine which neighborhood racial and income characteristics are associated with the best or worst *variety* of healthy foods, although a larger variety does imply better availability and higher chances for being able to prepare a larger diversity of healthy meals. This study is not so critical of variety – it is solely concerned with the availability (i.e. presence) of healthy foods thus the *possibility* for purchase and consumption.

¹⁰ My family and I lived in Topeka from 1989 to 2001.

Variety and *accessibility* are important issues but they cannot be addressed directly in this study. Despite this, some built-in “controls” allow these simple measurements to account for these issues though not in the most precise way. But, this study’s inability to enumerate and quantify variety and density will guarantee that the potential relationships between race and class segregation and food availability more striking; if residential race and income composition are found to be associated with healthy food *availability* as I define it, then it will be logical to assume that *variety* is also associated with race and income composition. If healthy food availability is lacking in neighborhoods with high proportions of marginalized citizens then there will be less potential for there to be healthy food variety, hence a food environment that is less encouraging of healthy food behaviors.

Strategic Research Methods

Neighborhood SES and Race Composition and Segregation – Conceptualizations from Previous Stratification and Food Desert Literature, and SES and Race in Topeka

Previous research that has focused on neighborhood food and shopping environments and disparities in access and availability according to race and SES has categorized these concepts differently. This is because of differing proportions of social classes and racial and ethnic groups found between different locations. This results in an array of different social conflicts and tensions depending on the location and its particular social and demographic characteristics.

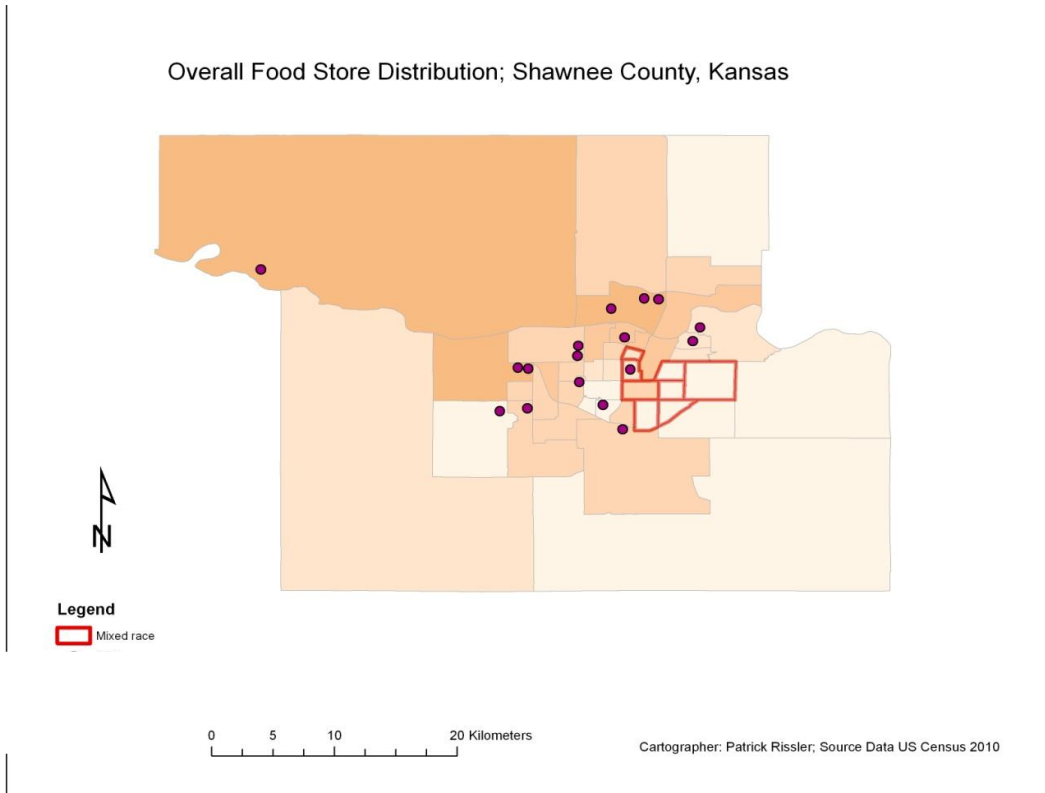
For Topeka, the racial composition of neighborhoods has been conceptualized as being “racially mixed” if the black household population makes up between 20 and 37% of the total household population of the census tract. If the population of black households is below 20% then the neighborhood is termed “white.” Not a single census tract in Topeka is comprised of more than 37% black households, the next highest neighborhood percentage of black households

being 26%. These racially mixed tracts have the highest proportions of black households in the city.

CHAPTER 4 – ANALYSIS, DISCUSSION, AND CONCLUSIONS

The following map illustrates the racial composition and overall distribution of food stores across Topeka and Shawnee County neighborhoods (also Appendix C.1). Racially mixed tracts are outlined in red. All other tracts contain less than 20% black households. Each purple dot represents a store that offers a minimal selection of fresh and/or frozen fruits and vegetables.¹¹ The different colored tracts indicate my conceptualization of full service RFO availability and are explained below in maps C.4 and C.5. What map 1 shows us is that food stores that offer healthy food are generally located outside of the mixed race cluster of tracts and are most heavily concentrated in neighborhoods to the west and north.

Map 1



¹¹ But they do not represent “full service RFO availability” as I have conceptualized it. This map merely shows the overall distribution of food stores. A map with full service RFO availability can be seen below.

Although the overall mean proportions of black and “other race” households (all other races besides black and white) is fairly even (.09 and .08, respectively), the “other” category is an aggregated concept that includes several other racial identifications.¹² Black and white are presently the most salient racial categories as few “global neighborhoods” (Logan and Zhang, 2010) have developed in this context.

If there is some sort of pattern to the distribution of full service RFOs according to socio-economic status it should follow the patterns of the relative socio-economic status of each neighborhood compared to city-wide averages (not compared to, e.g., state-wide, regional, or national averages). Median neighborhood household incomes were broken into thirds thus providing a low, medium, and high category. The lowest one-third (low) represents a neighborhood median income that falls between \$0 and \$33,022.67. 68.5% of black households and 41.5% of white households fall within this low category city-wide. The next one-third (medium) represents a neighborhood median income between \$33,023 and \$48,705. Overall, 11.4% of black households and 16.4% of white households fall within this medium category. The highest one-third (high) represents a median income that falls between \$48,706 and the maximum median neighborhood household income of \$150,455. 20.1% of black households and 42.1% of white households fall within this high category throughout Topeka.¹³ Black households are disproportionately low income, represent a lower percentage of medium income households than whites, and white households are more than twice as likely to be high income.

¹² These include: American Indian and Alaska Native, Asian alone, Native Hawaiian or other Pacific Islander, some other race alone, and two or more races (U.S. Census, 2010).

¹³ Data Source for city-wide household income categories: 2009-2011 ACS 3-year estimates. For convenience the scale used to express the percentage of black and white households that fall into low, medium, and high household income categories city-wide differs slightly from the scale derived from dividing neighborhood median household incomes into tertiles. This city-wide scale is: low: 0-\$34,099; medium: \$35,000-\$49,999; and high: \$50,000 and up. These are based on categories provided by the ACS and provide very close reflections of neighborhood median household income categories based on tertiles drawn from earlier 2006-2010 ACS 5-year estimates.

Neighborhood median income categories are then classified by race for each census tract or neighborhood. First is the distribution of black median household income (Appendix C.2).

Several tracts have high black median household incomes, but these are mostly scattered along the outside perimeters of the city center and these tracts have an extremely low percentage of black households (median = 5%, minimum = 0.4%, maximum = 10%). Low black median household incomes are numerous and all but two mixed race tracts have low black median household incomes.

Next is a map illustrating the distribution of white median household income (Appendix C.3). As with low black incomes, *high* white incomes are numerous and scattered throughout the city. In contrast to the distribution of low black income tracts, tracts with low white incomes are clustered in close physical proximity to one another. Almost every one of these tracts also has low black household incomes, and many are located in the cluster of mixed race tracts.

Of import is that though a couple of low white income tracts exist within the mixed race area, most low income white tracts are located to the northeast of this mixed race neighborhood cluster (Appendix C.5). This illustrates the importance of neighborhood racial composition as compared to SES in terms of determining the availability of healthy foods within neighborhoods. As this and the next two maps show *low income white tracts tend to have better food availability than low income black tracts*. Social class as measured by household income is somewhat important in determining food availability in this location, but the racial composition of a neighborhood appears more important.

Obviously numerous other indicators of socio-economic status should be included in order to provide a valid measure of “social class.” Some that have been used in previous research and have been hypothesized to be associated with food availability and accessibility

include: median housing value; housing status (either renter or owner); vehicle ownership; access to public transportation; and perceptions of personal safety while traveling by foot through one's neighborhood (or "travel burden"). Several of these variables measure wealth, a highly salient characteristic in determining one's access to various resources.

This present study includes only median neighborhood income to indicate socio-economic status or social class. This choice stems from two issues: first, 2010 tract-level data on median housing value and renter or owner status is not available as of this writing; and second, as Galvez et al. (2007) explain, other SES variables besides median household income are highly correlated with one another. Including other indicators of SES would be unnecessary. In fact, Moore and Diez-Roux (2006) do not distinguish between the effects of racial/ethnic composition and SES on food availability. This is for a similar reason – that the effects of SES are highly correlated with the effects of race/ethnicity.

Distribution of food stores in Topeka neighborhoods

The next maps illustrate my conceptualization of full service RFOs throughout Topeka and Shawnee county neighborhoods. Mixed race tracts are still highlighted in red. Food availability data is coupled with data on black and white median household income.

The map in Appendix C.4 illustrates the intersection of black household income and racial composition, and how this relates to full service RFO availability. Again, mixed race tracts are highlighted in red. This mixed race cluster of neighborhoods has two black middle-income tracts. All others are low black household income and have extremely low food availability as evidenced by lighter shading. The one tract that has food availability higher than 0-1.00 is a middle black income tract. The numbers in the legend represent the number of

healthy food stores located within a tract added to the number of stores located in all adjacent tracts.

Panning out from our focus on the cluster of mixed race tracts, we see that higher and middle black income tracts in the north and northwest have relatively high food availability. In neighborhoods outside of the cluster of mixed race tracts, low income black tracts (dotted texture) generally correspond with lower food availability as compared to the adjacent middle and high black income tracts. This map (C.4) supports the idea that household median income, or SES, mediates full service RFO availability.

The map in Appendix C.5 illustrates the intersection of white household income and racial composition, and how this relates to full service RFO availability. If we again focus on the mixed race tracts, we see three neighborhoods with low white household income. The other five tracts have middle white household income. Again, food availability is very low in all of these tracts. Most have zero full service RFO availability. Again the one exception is a middle income tract, this time middle white income.

Healthy food availability drastically improves as we shift from the cluster of mixed race tracts to the north and northwest. The highlighted tracts directly adjacent to the north of the mixed race tract cluster have incomes in the lowest third tertile yet enjoy much higher healthy food availability. This illustrates the mitigating effect that race has on improving healthy food availability in this type of location.

Comparing mixed race tracts with low white incomes and mixed race tracts with low black incomes shows that neighborhoods with low white median incomes have a larger proportion of tracts that contain a food store (33%) than those with low black median incomes

(17%). Race would appear to become more salient as SES goes down (as indicated by this comparison of “low” categories of black and white median household income).

Although some marginalized neighborhoods would appear to have better food availability as it is operationalized here, these maps reveal that low income blacks are segregated within inner city neighborhoods. Seven out of eight (88%) “mixed” race tracts have low black median household incomes. There is not a single “mixed” race tract along the perimeter of the city. There is a dearth of full service RFO availability within mixed race tracts in central and southeast Topeka as compared to white tracts in the west, northwest, north, and northeast.

Within the most marginalized neighborhoods in this city (mixed race and low income), full service RFO availability averages to be 1 while all other tracts have RFO availability nearly 4 times that (3.89). This most important piece of data shows that in Topeka, full service RFOs are unequally distributed “according to race and class,” and they are most disparately distributed among blacker and poorer neighborhoods (see Appendix C.4 illustrating mixed race and black low income neighborhoods and healthy food availability). Other areas, too, have extremely low healthy food availability, such as the most extreme northeastern, southwestern, and southeastern neighborhoods. All of the extreme southeastern, southwestern, and northeastern tracts have high white median income and low black median income, meaning white households will have an easier time accessing healthy foods in these areas than black households. If we look to the extreme northwestern neighborhood we see the only exception to low healthy food availability among large tracts on the outskirts of the city and county. This neighborhood has high white and black incomes, meaning that in this rare case of high food availability on the outskirts of town black and white households generally already possess the resources needed to procure healthy

food, even if it were to be less available. Also, as mentioned above, this neighborhood has an extremely small proportion of black households.

It is important to acknowledge that this simplified approach could be misleading. It fails to take into account other important variables that may be barriers to *accessing* healthy foods. Overall full service RFO availability will be the more valid measure in this case as we are examining the most economically marginalized neighborhoods. Individuals and households are less likely to possess the resources to purchase and maintain a motor vehicle. Public transportation can be a reliable alternative to owning a vehicle, but, Topeka has limited and poor quality public transportation. Data on wealth are missing here and could lend validity to the hypothesized causal relationships between SES, race, and healthy food availability. Although indicators of wealth are often associated with other SES indicators like household income, inclusion of the full-breadth of SES data would contribute to a more complete illustration of reality.

Implications for Systemic Health Outcomes Among Marginalized Populations

This research provides further evidence that those marginalized by race and class face physical/spatial boundaries in terms of accessing healthy foods. This and previous researchers' work at uncovering this systemic inequality sheds light upon problems of great concern in the U.S. Numerous researchers have documented stratified patterns of diet-related poor health outcomes (Nestle et al. 1998; Cummins and Macintyre 2006; Moore and Diez-Roux 2006; Flora and Gillespie 2009; Schafft et al. 2009). Deprived food environments are associated with increased rates of overweight and obesity (Schafft et al. 2009: 165, 171). Also, overweight and obesity can be associated with deprived food environments (Guthman 2011). It is beyond the

scope of this project to make implications about health outcomes as they relate to food environments in Topeka or vice versa.

Food environment and other types of research show that many of the causes of this systematic decline in health as the result of poor or low quality food intake are *structural*. These structural conditions extend beyond the control of individual consumers, particularly those on the margins. Social mechanisms that have led to segregated neighborhoods in the U.S., include “redlining,” neighborhood disinvestment and the resulting decay of commercial and retail connections and infrastructure; “steerage,” “blockbusting,” and sub-prime lending (Massey and Denton 1993: 132-182; Pongracz 2004), and these actions result in numerous social disadvantages. As discussed in Chapter 1, when those marginalized by race can locate themselves within close physical proximity to the dominant race it is easier to integrate and access more rewarding social networks. This racial residential integration tends to reduce daily exposure to unhealthy behaviors (Cummins and Macintyre 2006; Pampel et al. 2010; Nettle 2011), provide more accessible and available healthy foods and stores that offer these products on a regular basis, offer better protection from crime, and more and better quality health services (Woldoff and Ovidia 2009: 70). Food deserts are perhaps the most important deleterious consequence of residential segregation because of the universal need for food and the implications that healthy food intake has for health. This thesis in no way is advocating for a “one size fits all” approach to food deserts – that is to support the idea that more accessible stores and healthy food equals better health. The primary argument here is that the general food desert thesis, which posits that healthy food access and availability is systematically unequal, pans out in a smaller urban context. This means that marginalized citizens in large metropolises and smaller urban areas alike face rigid structural boundaries to participate in the burgeoning

“healthy food culture” or “healthism” (Guthman, 2011) that is decidedly a positive phenomenon in terms of biological health.¹⁴ Research that stems from this and other similar preliminary quantitative, foundational, and descriptive studies will provide a better and more well-rounded understanding of food deserts so that effective solutions can be pursued in the multitude of nuanced food environments in the U.S. Many food assistance strategies to date have been ineffective. We need more integrative, holistic, creative, and *context-specific* food policies (Lang et al. 2009). One of the points of this research is that context should be analyzed as locally as feasible. The overall structural mechanisms of how neighborhood segregation has developed and is maintained are relatively well-understood, and, it is generally agreed upon that food is unequally accessible and available according to SES and race. In the case of Topeka, a smaller urban context, we can see patterns similar to those in the large urban centers, which have dominated research attention to date.

Solutions will come with a more nuanced understanding of U.S. food environments as a whole, and this will result from a better understanding of the various types of contexts. This was the original purpose of this thesis – to explore whether the general patterns uncovered in food desert research are also found within a context-type that has been almost completely ignored.

This research shows that these patterns can also appear in smaller urban contexts. These cities have much smaller populations than the large metropolises that have been the focus of these types of studies. But, there are numerous small urban contexts particularly in the Midwest. This means that there are a great number of people in the U.S. that must navigate food deserts besides those in the location-types that have been the central focus. In Topeka, household median income (the proxy for SES) mediates full service healthy food availability (see map C.4).

¹⁴ But negative when it comes to reproducing societal discourses that promote neoliberal norms of self-efficacy, self-governance, and individualism. The problem is, “healthy food culture” and “healthism” are culturally specific norms that speak to those who are already relatively healthy (Guthman 2011: 60-61).

Healthy food availability is extremely low or non-existent in all but one mixed race tract. Not surprisingly, median household incomes are higher in this particular tract (but only for white households). Race has a mitigating effect on healthy food availability as evidenced by tracts directly north of the mixed race tract cluster. These tracts also have extremely low incomes (in the lowest tertile) but are overwhelmingly white and enjoy much higher healthy food availability (see map C.5). Neighborhoods with low white median incomes have a larger proportion of tracts that contain a food store (33%) than those with low black median incomes (17%). Race would appear to become more salient as SES goes down (as indicated by this comparison of “low” categories of black and white median household income). There is a dearth of full service RFO availability within mixed race tracts in central and southeast Topeka as compared to white tracts in the west, northwest, north, and northeast.

This type of research is still admittedly young and is undergoing methodological development (Beaulac et al. 2009; Goldsberry et al. 2010). There is still little measurement consistency and generalizable knowledge that has resulted (Glanz 2009: S96). The relatively simple yet rigorous methodology that this paper promotes should be fairly easily understood by researchers and the public alike. The visual element of the maps allows a relatively large amount of data to be presented succinctly. These techniques are also easily replicable using Geographic Information Systems (GIS) software, which is becoming increasingly common in the social sciences, particularly geography and sociology.

So, what social mechanisms cause the mal-distribution of healthy foods across U.S. neighborhoods and how do these mechanisms operate? This thesis and other food desert scholarship cannot yet offer a definitive answer to this theoretical question. It appears that the economic driving force of food production and distribution coupled with neo-liberal cultural

attitudes and practices has led to a very “rationalized” distribution of healthy foods. Healthy foods are generally more expensive than processed foods that are abundantly available within poorer neighborhoods. In order to capture the greatest market share, stores have had to locate themselves away from “undesirable” neighborhoods because of the lack of spending power in the surrounding community and the low likelihood that consumers with more spending power will be willing to travel there. This thesis puts forward the hypothesis that the social mechanisms that lead to neighborhood race and class segregation also contribute significantly to poor food environments within marginalized neighborhoods.

In a small urban area in the Midwest, are stores that offer healthy food unequally distributed across neighborhoods according to race and class? How well do explanations developed in the literature hold up in this context, and, why or why not? This thesis provides clear and easily interpreted evidence that stores offering healthy food are indeed unequally distributed according to race and class in Topeka, Kansas. There is certainly not a perfect correlation between race and SES composition of a neighborhood and healthy food availability but the evidence presented here agrees with findings from other food desert research – that poorer and blacker neighborhoods generally have less and lower quality food available within a close physical proximity of their residences and because of this face more obstacles in terms of accessibility. Households with higher incomes and more resources are less affected by lack of physical-proximity to healthy food stores. More income makes purchasing and maintaining a vehicle(s) much easier and relieves the distance obstacle that poorer families face. When shopping at a store that offers healthy food, more income allows an individual or household to purchase more healthy, fresh food as these are generally more expensive than less healthy and more processed foods.

Future Research

These findings point to the need for more thorough research in these types of contexts (small urban locations). Few previous research efforts have focused on this particular location-type, and what few findings there are fail to support assertions about the state of the U.S. food environment as a whole. This thesis provides some support and provides the framework for a project that can better analyze individual consumers' perceptions and how they navigate (or not) the various physical and cultural boundaries to purchasing, preparing, and consuming healthy foods. Future research needs to better understand the food environment *on-the-ground*. This means more intense engagement with local communities. This will help inform context-specific solutions and real engagement that can benefit researchers and subjects alike.

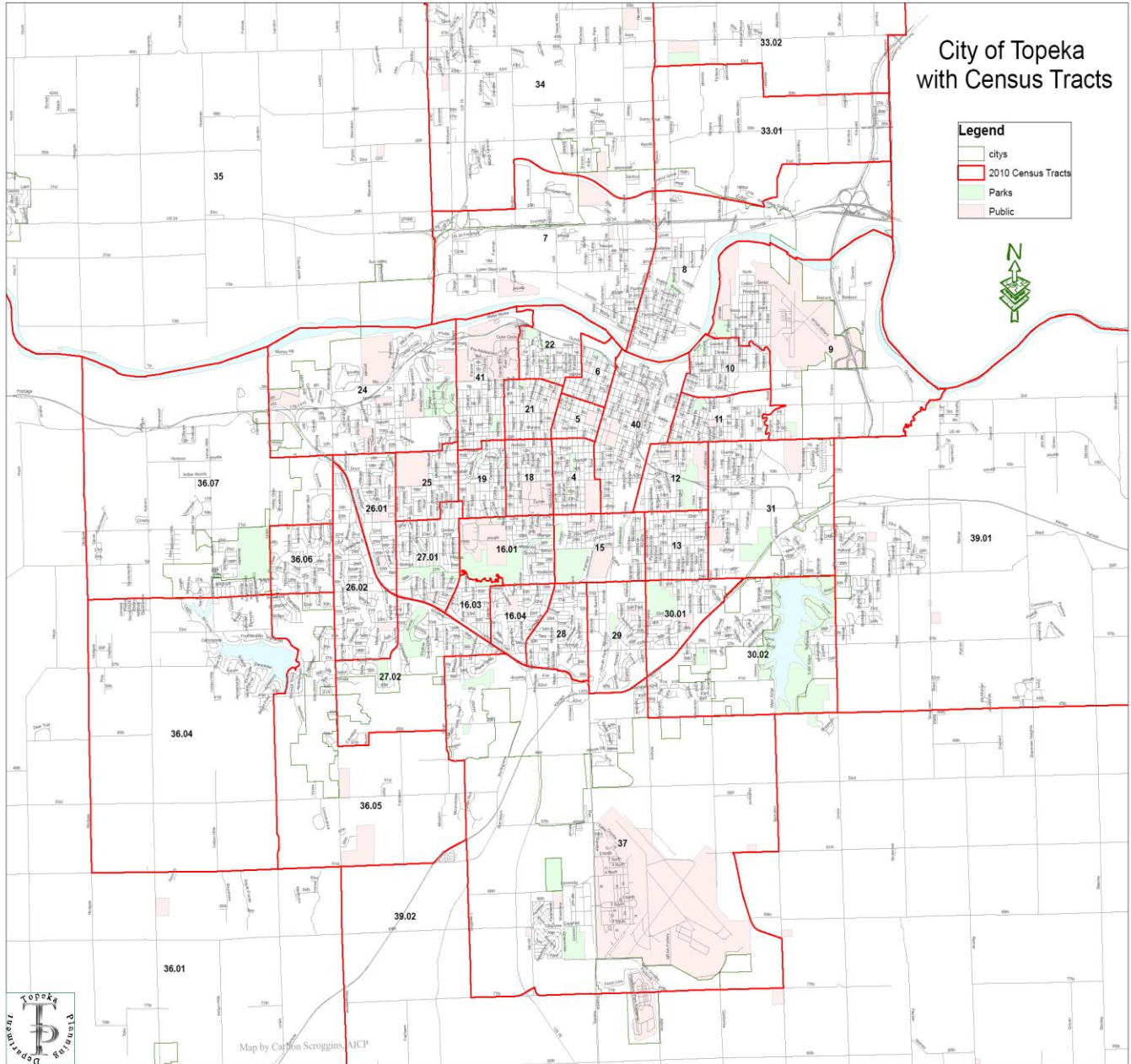
There needs to be more focus on explicitness and clarity in conceptualization. This will help encourage continuity among multi-disciplinary research efforts. Finally, historical and qualitative data need to be analyzed in order to provide a richer and more nuanced illustration of U.S. food environments and how they have developed. This more theoretical and mixed-methods approach, informed by a valid quantitative framework, will lead to insights regarding *how* these mechanisms operate and how particular segments of the population navigate them (or not); additionally, it will lead to improving food environments in a variety of contexts.

APPENDIX A – Store Types and Standard Industrial Classification (SIC) Codes

Store Type	SIC Code
Grocers-Retail	541105
Wholesale Clubs	531110
Food Products-Retail	541104
Food Markets	541101
Fruits, Vegetables and Produce	543101
Convenience Stores	541103
Service Stations-Gas and Oil	554101
Cigar, Cigarette and Tobacco Dealers	599301
Sausages/other meat products Manufacturers	201398
Meat-Retail	542107
Seafood-Retail	542101
News Dealers	599401
Department Stores	531102

APPENDIX B₁₅

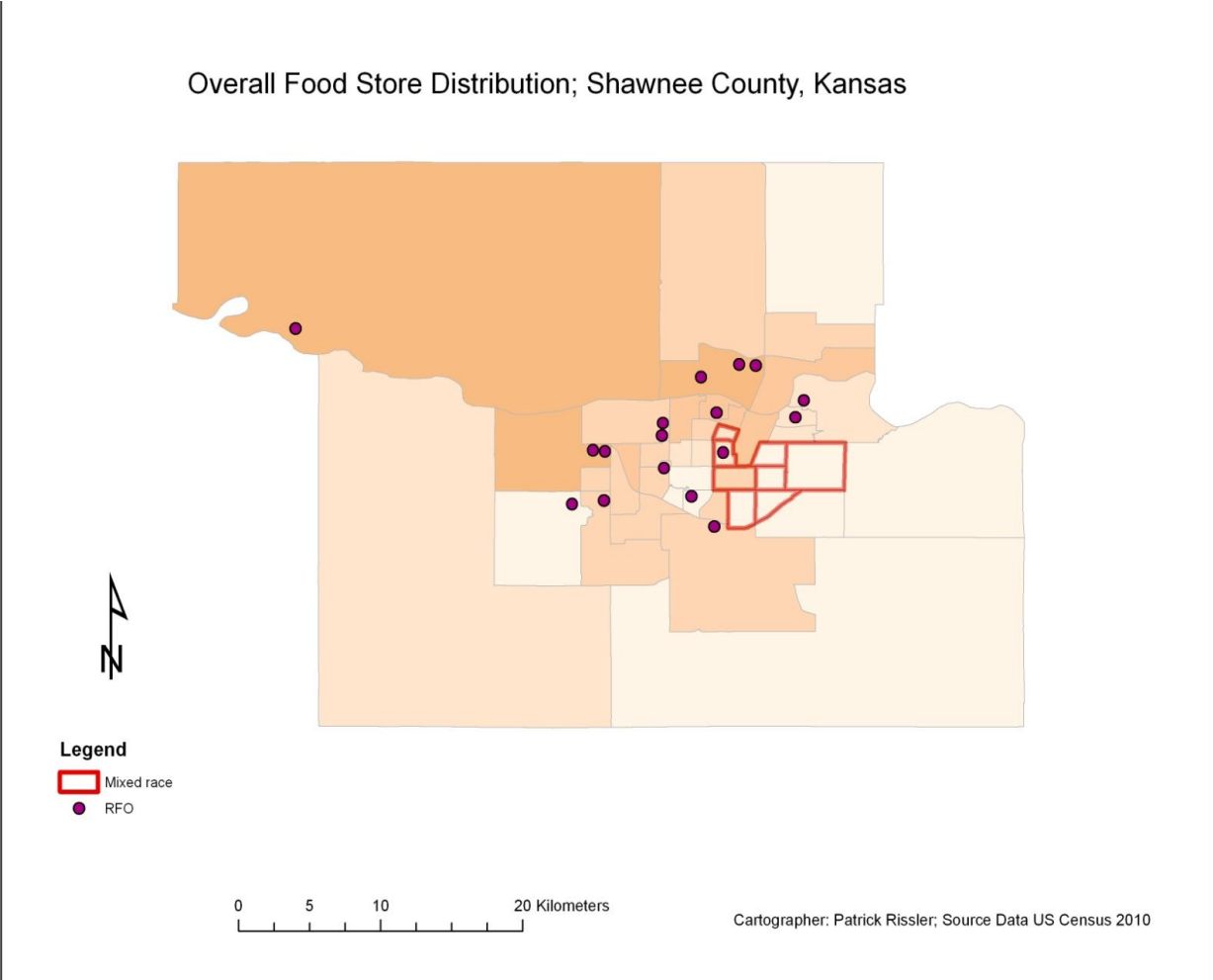
City of Topeka and Shawnee County U.S. 2010 Census Tracts



¹⁵ Thank you to Carlton Scroggins with the Topeka Department of Planning for generating this GIS map.

APPENDIX C.1 – TOPEKA CENSUS TRACTS WITH RACE, MEDIAN INCOME, AND OVERALL FOOD DISTRIBUTION¹⁶

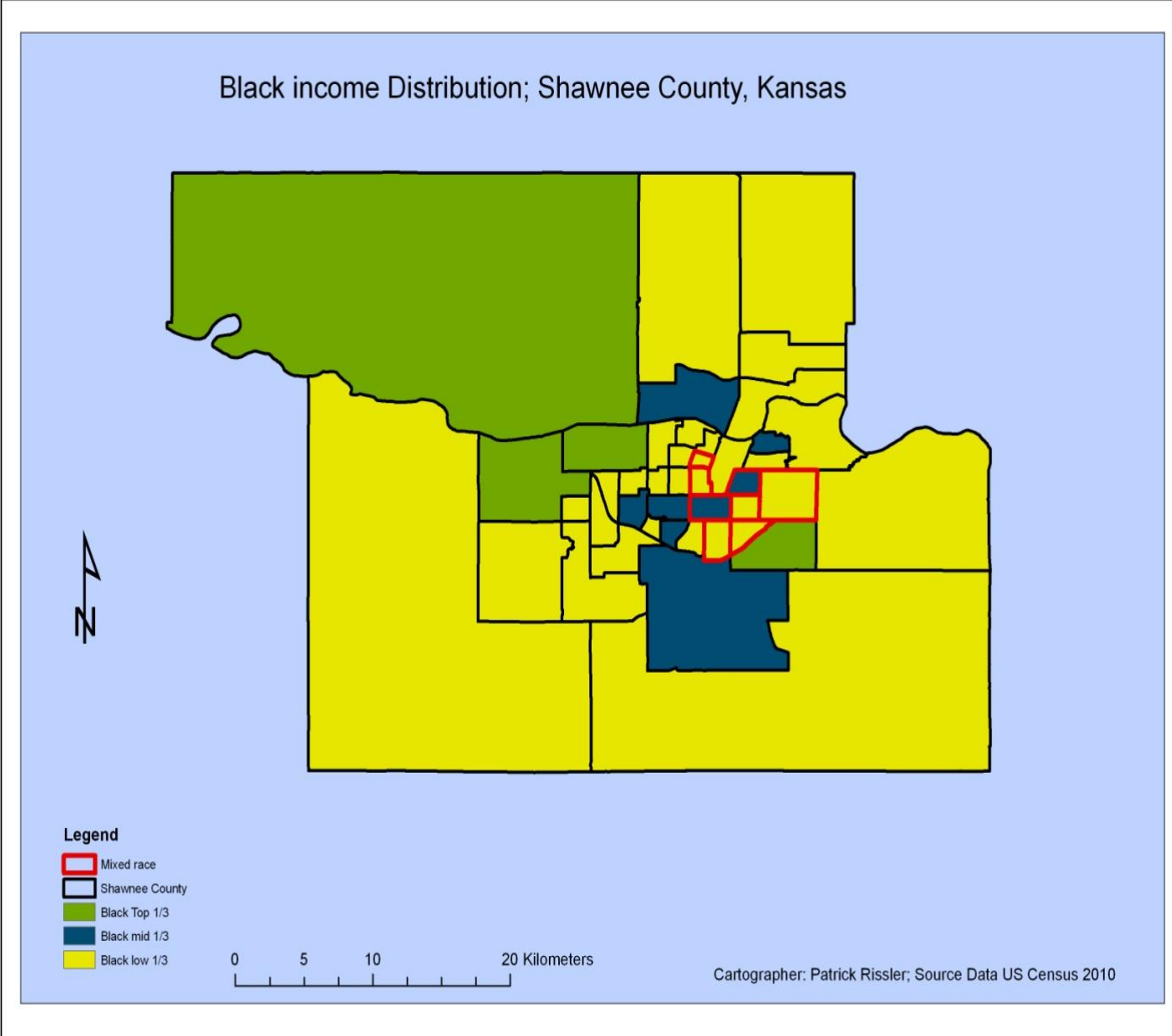
Map C.1



¹⁶ This is the raw total number of food stores that offer fresh and/or frozen fruits and vegetables within each census tract. Each purple dot represents one full service food store. This is not my conceptualization of full service RFO availability where food stores from adjacent tracts are added to the count of stores within particular tracts. The different colored tracts represent full service RFO availability. This is explained in the legend in Appendix C.5. Here the focus is on the overall distribution of stores.

APPENDIX C.2 (continued) – TOPEKA CENSUS TRACTS WITH DISTRIBUTION OF BLACK MEDIAN HOUSEHOLD INCOME¹⁷

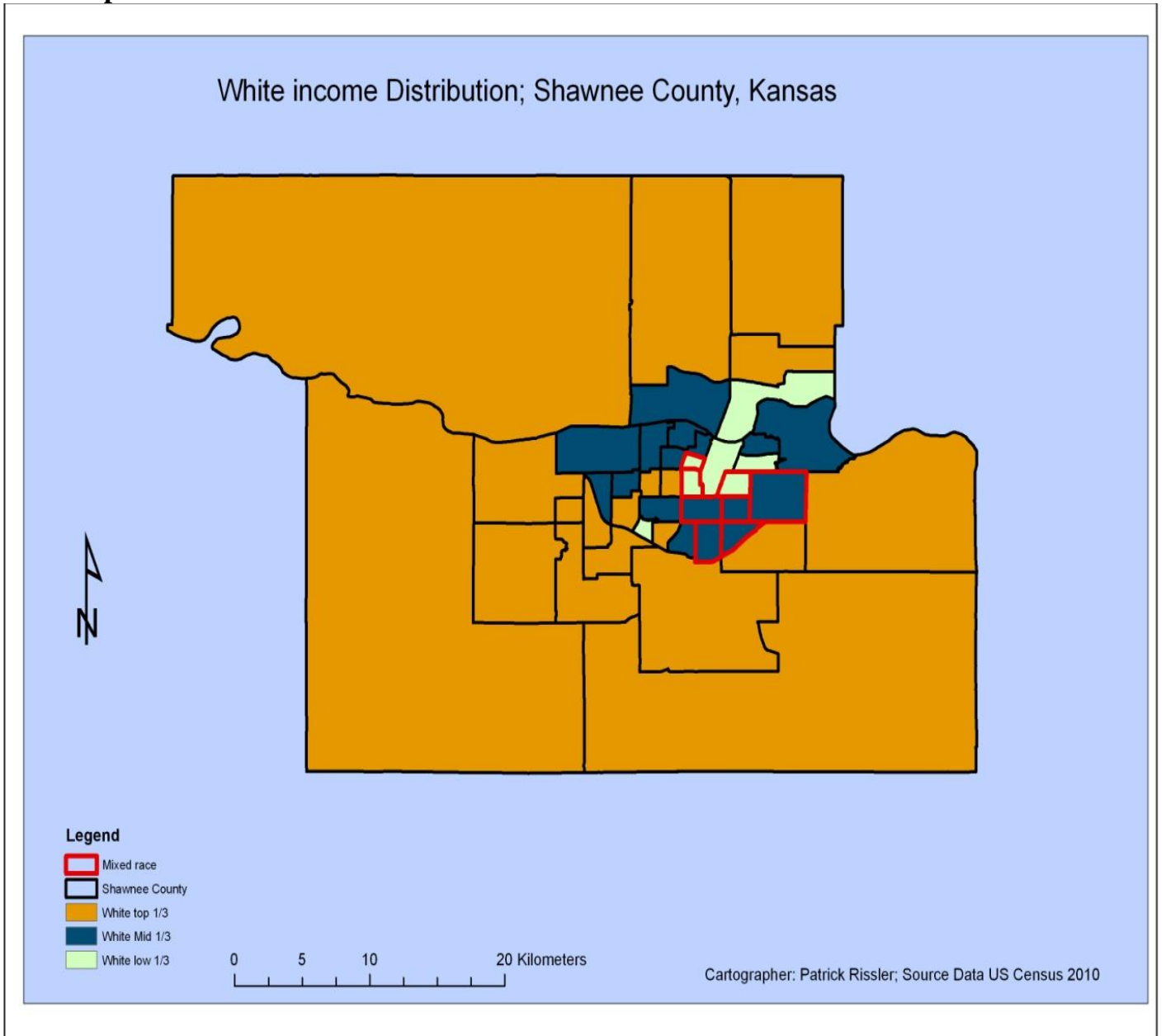
Map C.2



¹⁷ The data reflected in this and all other maps is based on the 2010 US Census and 2006-2010 ACS 3-year estimates.

APPENDIX C.3 (continued) – TOPEKA CENSUS TRACTS WITH DISTRIBUTION OF WHITE MEDIAN HOUSEHOLD INCOME

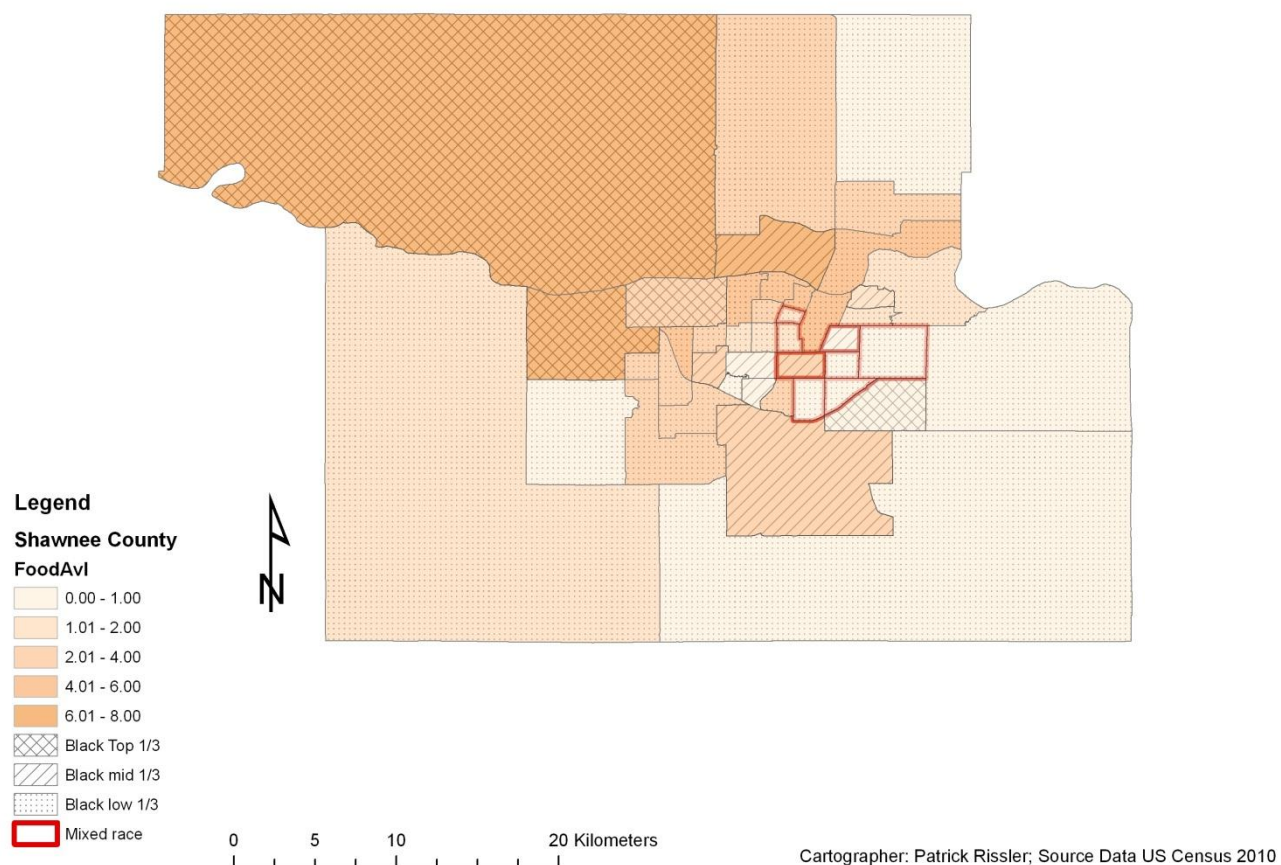
Map C.3



APPENDIX C.4 (continued) – TOPEKA CENSUS TRACTS WITH FULL SERVICE R.F.O. AVAILABILITY AND BLACK MEDIAN HOUSEHOLD INCOME¹⁸

Map C.4

Black Income and Availability Distribution; Shawnee County, Kansas

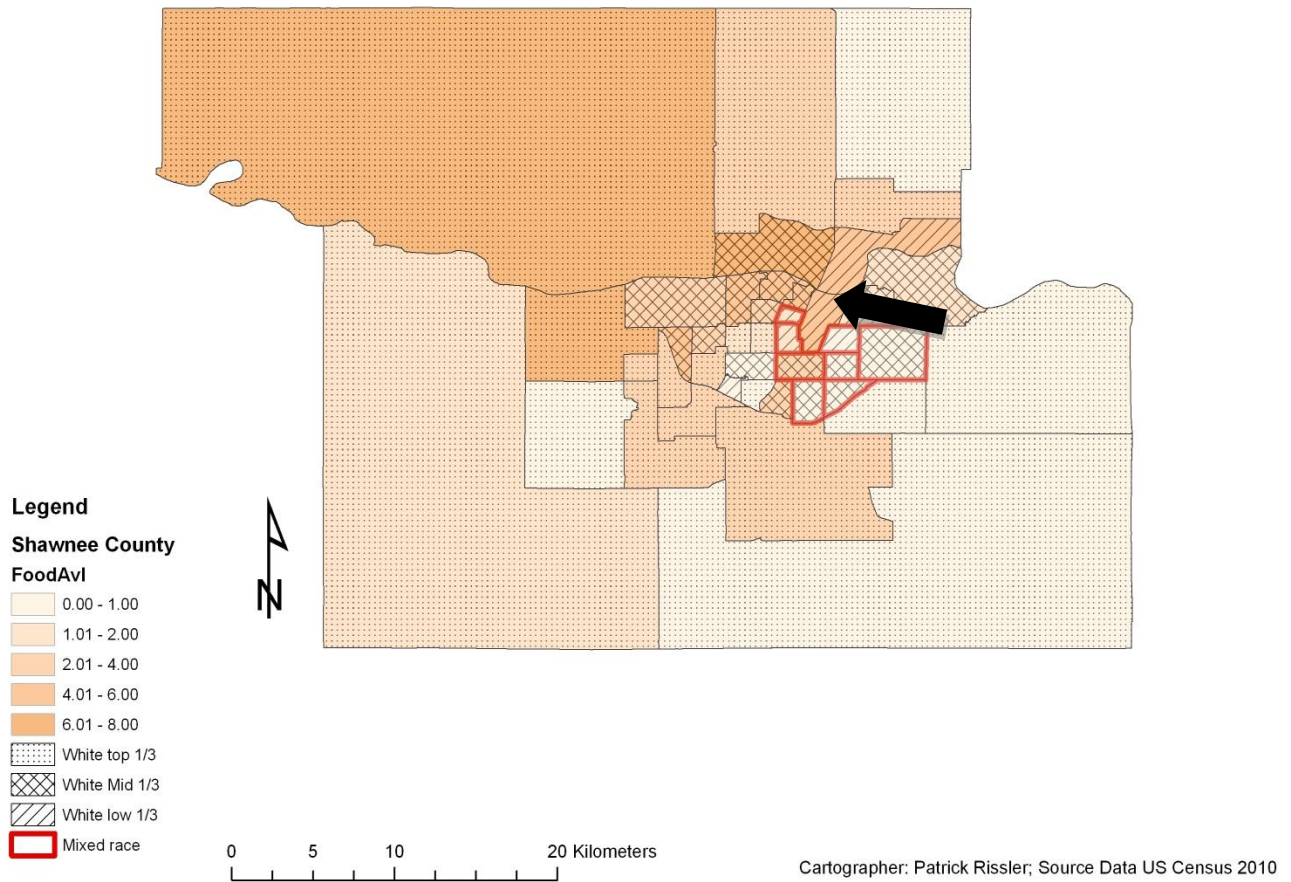


¹⁸ The numbers for food availability in the legend reflect my conceptualization of full service RFO availability. For example, if a tract has a food availability measurement of 4.01-6.00 that means that the number of stores within that tract added to the number of stores in all adjacent tracts equals 4.01-6.00.

APPENDIX C.5 (continued) – TOPEKA CENSUS TRACTS WITH FULL SERVICE R.F.O. AVAILABILITY AND DISTRIBUTION OF WHITE MEDIAN HOUSEHOLD INCOME¹⁹

Map C.5

White Income and Availability Distribution; Shawnee County, Kansas



¹⁹ The numbers for food availability in the legend reflect my conceptualization of full service RFO availability. For example, if a tract has a food availability measurement of 4.01-6.00 that means that the number of stores within that tract added to the number of stores in all adjacent tracts equals 4.01-6.00.

REFERENCES

- Bader, Michael D.M., Marnie Purciel, Paulette Yousefzadeh, and Kathryn M. Neckerman. 2010. "Disparities in Neighborhood Food Environments: Implications of Measurement Strategies." *Economic Geography*. 86(4): 409-430.
- Barr, Donald. 2008. "Race/Ethnicity, SES, and Health." Pp. 134-169 in *Health Disparities in the United States: Social Class, Race, Ethnicity, and Health*. The Johns Hopkins University Press.
- Beaulac, Julie, Elizabeth Kristjansson, and Steven Cummins. 2009. "A Systematic Review of Food Deserts, 1966-2007." *Preventing Chronic Disease*. 6(3): A105-A119.
- Becker, Howard S. 1982. *Art Worlds*. University of California Press.
- Bell, Michael Mayerfeld. 2004. *Farming For Us All: Practical Agriculture and the Cultivation of Sustainability*. The Pennsylvania University Press. University Park, Pennsylvania.
- Black, Jennifer L., and James Macinko. 2007. "Neighborhoods and Obesity." *Nutrition Reviews*. 66(1): 2-20.
- Bobo, Lawrence, Kleugel, James, and Ryan A. Smith. 1997. "Laissez-faire Racism: The Crystallization of a Kinder, Gentler, Antiblack ideology." Pp. 17 in *Racial Attitudes in the 1990s*, eds. Steven A. Tuch and Jack K. Martin. Oxford University Press.
- Bobo, Lawrence D. 2011 "Somewhere Between Jim Crow and Post Racialism: Reflections on the Racial Divide in America Today." *Daedalus*. 140(2): 11-36.
- Bodor, J. Nicholas, Donald Rose, Thomas A. Farley, Christopher Swalm, and Susanne K. Scott. 2006. "Neighbourhood Fruit and Vegetable Availability and Consumption: The Role of Small Food Stores in an Urban Environment." *Public Health Nutrition*. 11(4): 413-420.
- Broadway, Michael. 2007. "Meatpacking and the Transformation of Rural Communities: A Comparison of Brooks, Alberta and Garden City, Kansas." *Rural Sociology*. 72(4): 560-582.
- Bureau of Labor Statistics. 2011. Table 7. Employment Status of the Civilian Noninstitutional Population 25 Years and Over By Educational Attainment, Sex, Race, and Hispanic or Latino Ethnicity (2009, 2010). <ftp://ftp.bls.gov/pub/special.requests/lf/aat7.txt>. Accessed April 9, 2012.
- Charreire, H elene, Romain Casey, Paul Salze, Chantal Simon, Basile Chaix, Arnaud Banos, Dominique Badariotti, Christiane Weber, and Jean-Michel Oppert. 2010. "Measuring the Food Environment Using Geographic Information Systems: A Methodological Review." *Public Health Nutrition*. 13(11): 1773-1785.

- Cole-Frieman, Karl A. 1996. "The Ghosts of Segregation Still Haunt Topeka, Kansas: A Case Study on the Role of the Federal Courts in School Desegregation." *Kansas Journal of Law and Public Policy*. Fall (23).
- Crowder, Kyle, Scott J. South, and Erick Chavez. 2006. "Wealth, Race, and Inter-Neighborhood Migration." *American Sociological Review*. 71(1): 72-94.
- Cummins, Steven and Sally Macintyre. 2002. "Food Deserts – Evidence and Assumptions in Health Policy Making." *British Medical Journal*. 325(7361): 436-438.
- Cummins, Steven and Sally Macintyre. 2006. "Food Environments and Obesity – Neighborhood or Nation?" *International Journal of Epidemiology*. 35: 100-104.
- Darity Jr., William. 2011. "The New (Incorrect) Harvard/Washington Consensus on Racial Inequality." *Du Bois Review*. 8(2): 467-495.
- Du Bois, William E.B. 1965 [1903]. *The Souls of Black Folks*. Pp. 207-389 in *Three Negro Classics*. Avon Books. New York, NY.
- Dun and Bradstreet. www.dnb.com. Accessed 13 April, 2012.
- Dunkley, Bill, Amy Helling, and David S. Sawicki. 2004. "Accessibility Versus Scale: Examining the Tradeoffs in Grocery Stores." *Journal of Planning Education and Research*. 23: 387-401.
- Duvall, Chris S., Philip H. Howard, and Kirk Goldsberry. 2010. "Apples and Oranges? Classifying Food Retailers in a Midwestern U.S. City Based on the Availability of Fresh Produce." *Journal of Hunger and Environmental Nutrition*. 5: 526-541.
- Fisher, Tory C. "A Case Study on the Development of Desegregation in USD 501 in Topeka, Kansas, the Home of the Desegregation Movement." Master's Thesis, Kansas State University, 2011.
- Flora, Cornelia Butler, and Ardyth Harris Gillespie. 2009. "Making Healthy Choices to Reduce Childhood Obesity: Community Capitals and Food and Fitness." *Community and Development*. 40(2): 114-122.
- Franco, Manuel, Ana V. Diez Roux, Thomas A. Glass, Benjamin Caballero, and Frederick L. Brancati. 2008. "Neighborhood Characteristics and Availability of Healthy Foods in Baltimore." *American Journal of Preventative Medicine*. 35(6): 561-567.
- Freeman, David A. 1991. "An Example of Real Science Based on Observational Data: John Snow's Work on Cholera in 1855." Pp. 294-299, 304 in "Statistical Models and Shoe Leather." *Sociological Methodology*. 21: 291-313.

- Galvez, Maida P., Kimberly Morland, Cherita Raines, Jessica Kobil, Jodi Siskind, James Godbold, and Barbara Brenner. 2007. "Race and Food Store Availability in an Inner-City Neighbourhood." *Public Health Nutrition*. 11(6): 624-631.
- Geertz, Clifford. 1973. *The Interpretation of Cultures: Selected Essays by Clifford Geertz*. Basic Books.
- Glanz, Karen. 2009. "Measuring Food Environments: A Historical Perspective." *American Journal of Preventive Medicine*. 36(45): S93-S98.
- Goldberry, Kirk, Chris S. Duvall, Philip H. Howard, and Joshua E. Stevens. 2010. "Visualizing Nutritional Terrain: A Geospatial Analysis of Pedestrian Produce Accessibility in Lansing, Michigan, U.S.A." *Geocarto International*. 25(6): 485-499.
- Guthman, Julie. 2011. *Weighing In: Obesity, Food Justice, and the Limits of Capitalism*. University of California Press.
- Guy, Clifford M., and Gemma David. 2004. "Measuring Physical Access to 'healthy foods' in Areas of Social Deprivation: A Case Study in Cardiff." *International Journal of Consumer Studies*. 28(3): 222-234.
- Handy, S.L., and D.A. Niemeier. 1997. Measuring Accessibility, An Exploration of Issues and Alternatives. *Environment and Planning*. A(29): 1175-1194.
- Helling, Amy, and David S. Sawicki. 2003. "Race and Residential Accessibility to Shopping and Services." *Housing Policy Debate*. 14(1&2): 69-101.
- Herrnstein, Richard J. and Charles Murray. 1996. *The Bell Curve: Intelligence and Class Structure in American Life*. Free Press Paperbacks, New York.
- Howard, Philip H. 2009. "Consolidation in the North American Organic Food Processing Sector, 1997 to 2007." *International Journal of Sociology of Agriculture and Food*. 16(1): 13-30.
- InfoUSA. www.infousa.com. Accessed January 2012.
- Jackson, Wes, personal interview, April 11, 2012. The Land Institute, Salina, KS.
- Johnston, Josee, and Shyon Baumann. 2009. *Foodies: Democracy and Distinction in the Gourmet Foodscape*. Routledge.
- Kelly, Bridget, Victoria M. Flood, and Heather Yeatman. 2011. "Measuring Local Food Environments: An Overview of Available Methods." *Health and Place*. 17: 1284-1293.

- Kluger, Richard. 2004. *Simple Justice: The History of Brown v. Board of Education and Black America's Struggle for Equality*. Alfred A. Knopf: New York.
- Kneebone, Elizabeth, Carey Nadeau, and Alan Berube. 2011, November. "The Re-emergence of Concentrated Poverty: Metropolitan Trends in the 2000s." The Metropolitan Policy Program at Brookings.
- Kwate, Naa Oyo A. 2008. "Fried Chicken and Fresh Apples: Racial Segregation as a Fundamental Cause of Fast Food Density in Black Neighborhoods." *Health and Place*. 14(1): 32-44.
- Lake, Amelia, and Tim Townshend. 2006. "Obesogenic Environments: Exploring the Built and Food Environments." *The Journal of the Royal Society for the Promotion of Health*. 126(6): 262-267.
- Lang, Tim, David Barling, and Martin Caraher. 2009. *Food Policy: Integrating Health, Environment, and Society*. Oxford University Press.
- Laskawy, Tom. "More Evidence that Grocery Stores Alone Won't Solve the Obesity Crisis." *Grist*. 9 March 2012. Accessed online 11 March 2012.
- Lichter, Daniel T. and Kenneth M. Johnson. 2007. "The Changing Spatial Concentration of America's Rural Poor Population." *Rural Sociology*. 72(3): 331-358.
- Logan, John R. and Charles Zhang. 2010. "Global Neighborhoods: New Pathways to Diversity and Separation." *American Journal of Sociology*. 115(4): 1069-1109.
- Logan, John R. 2011. "Separate and Unequal: The Neighborhood Gap for Blacks, Hispanics, and Asians in Metropolitan America." US 2010 project. July: 1-22.
- Lyson, Thomas A. 2004. *Civic Agriculture: Reconnecting Farm, Food, and Community*. Tufts University Press. Medford, MA.
- Macleod, Jay. 1987. *Ain't No Makin' It: Leveled Aspirations in a Low-Income Neighborhood*. Westview Press. Boulder, Colorado.
- Mangino, William. 2010. "Race to College: The 'Reverse Gap'." *Race and Social Problems*. 2(3-4): 164-178.
- Massey, Douglas S. 1985. "Ethnic Residential Segregation: A Theoretical Synthesis and Empirical Review." *Sociology and Social Research*. 69(3): 315-350.
- Massey, Douglas S. and Nancy A. Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Harvard University Press.

- Martin, Philip. 2009. *Importing Poverty? Immigration and the Changing Face of Rural America*. Yale University Press.
- Moore, Latetia V. and Ana V. Diez Roux. 2006. "Associations of Neighborhood Characteristics with the Location and Type of Food Stores." *American Journal of Public Health*. 96(2): 325-330.
- Morland, Kimberly and Susan Filomena. 2007. "Disparities in the Availability of Fruits and Vegetables Between Racially Segregated Urban Neighborhoods." *Public Health Nutrition*. 10(12): 1481-1489.
- Morton, Lois Wright, Ella Annette Bitto, Mary Jane Oakland, and Mary Sand. 2005. "Solving the Problems of Iowa Food Deserts: Food Insecurity and Civic Structure." *Rural Sociology*. 70(1): 94-112.
- Murray, Charles. 1986a. "White Welfare, White Families, White Trash." *National Review*. March 28: 30-34.
- Nestle, Marion, Rena Wing, Leann Birch, Lorelei DiSogra, Adam Drewnoski, Suzette Middleton, Madeleine Signman-Grant, Jeffrey Sobal, Mary Winston, and Christina Economos. 1998. "Behavioral and Social Influences on Food Choice." *Nutrition Reviews*. 56(5): S50-S74.
- Nettle, Daniel. 2011. "Large Differences in Publicly Visible Health Behaviours Across Two Neighbourhoods of the Same City." *PLoS ONE*. 6(6): e21051.
- Nord, Mark, Alisha Coleman-Jensen, Margaret Anders, and Steven Carlson. 2010. "Household Food Security in the U.S., 2009." USDA ERS report. ERR-108.
- Oakes, J. Michael, Loïuse C. Masse, Lynne C. Messer. 2009. "Work Group III : Methodologic Issues in Research on the Food and Physical Activity Environments." *American Journal of Preventive Medicine*. 36(45): S177-S181.
- Obama, Barack. 2008. "A More Perfect Union." Speech given in Philadelphia, PA, March 18. <http://blogs.wsj.com/washwire/2008/03/18/text-of-obamas-speech-a-more-perfect-union/>. Accessed April 19, 2012.
- Pager, Devah. 2003. "The Mark of a Criminal Record." *American Journal of Sociology*. 108(5): 937-975.
- Pampel, Fred C., Patrick M. Krueger, and Justin T. Denney. 2010. "Socioeconomic Disparities in Health Behaviors." *Annual Review of Sociology*. 36: 349-370.
- Pattillo, Mary. 2007. *Black on the Block: The Politics of Race and Class in the City*. The University of Chicago Press.

- Pongracz, Petra. 2004. "Attracting Supermarkets to Underserved, Urban Markets – A Case Study in a Low-Income Neighborhood of Durham, North Carolina." Network of European and U.S. Regional and Urban Studies (NEURUS) papers. 15 March. Accessed online March 2, 2012.
- Powell, Lisa M., Euna Han, Shanon N. Zenk, Tamkeen Khan, Christopher M. Quinn, Kevin P. Gibbs, Oksana Pugach, Dianne C. Barker, Elissa A. Resnick, Jaana Myllyluoma, and Frank J. Chaloupka. 2011. "Field Validation of Secondary Commercial Data Sources on the Retail Food Outlet Environment in the U.S." *Health and Place*. 17: 1122-1131.
- Reisig, VMT, and A. Hobbiss. 2000. "Food Deserts and How to Tackle Them: A Study of One City's Approach." *Health Education Journal*. 59: 137-149.
- Schafft, Kai A., Eric B. Jensen, and C. Clare Hinrichs. 2009. "Food Deserts and Overweight Schoolchildren: Evidence from Pennsylvania." *Rural Sociology*. 74(2): 153-177.
- Stull, Donald D., Michael J. Broadway, and David Griffeth, eds. 1995. *Any Way You Cut It: Meat Processing and Small-Town America*. University Press of Kansas.
- Thomas, Brian J. 2010. "Food Deserts and the Sociology of Space: Distance to Food Retailers and Food Insecurity in an Urban American Neighborhood." *International Journal of Human and Social Sciences*. 5(6): 400-409.
- United States Census Bureau. North American Industrial Classification System (NAICS). Introduction. www.census.gov/eos/www/naics/. 10 September, 2009.
- United States Census Bureau. 2010. Summary File 1. <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>. Accessed Fall 2011 and Spring 2012.
- United States Department of Agriculture, Economic Research Service. September 7, 2011. "Food Security in the United States: Definitions of Hunger and Food Security." <http://www.ers.usda.gov/briefing/foodsecurity/labels.htm>. Accessed 15 April, 2012.
- Whiting, Erin Feinauer, and Carol Ward. 2010. "Food Provisioning Strategies, Food Insecurity, and Stress in an Economically Vulnerable Community: The Northern Cheyenne Case." *Agriculture and Human Values*. 27: 489-504.
- Wilson, William Julius. 2009. *More Than Just Race: Being Black and Poor in the Inner City*. W.W. Norton and Company Inc. New York.
- Witters, Dan. 2012. "More Than 15% Obese in Nearly All U.S. Metro Areas: Obesity Costs Cities an Estimated \$80 billion a year." The Gallup Inc. <http://www.gallup.com/poll/153143/Obese-Nearly-Metro-Areas.aspx#1>. Accessed March 13, 2012.

Woldoff, Rachael A. and Seth Ovadia. 2009. "Not Getting Their Money's Worth: African-American Disadvantages in Converting Income, Wealth, and Education into Residential Quality." *Urban Affairs Review*. 45(1): 66-91.

Wrigley, Neil, Daniel Warm, Barrie Margetts, and Amanda Whelan. 2002. "Assessing the Impact of Improved Retail Access on Diet in a 'Food Desert': A Preliminary Report." *Urban Studies*. 39(11): 2061-2082.

Zenk, Shannon N., Laurie L. Lachance, Amy J. Schulz, Graciela Mentz, Srimathi Kannan, and William Ridella. 2009. "Neighborhood Retail Food Environment and Fruit and Vegetable Intake in a Multiethnic Urban Population." *American Journal of Health Promotion, Inc.* 23(4): 255-264.

Zenk, Shannon N., Angela M. Odoms-Young, Constance Dallas, Elaine Hardy, April Watkins, Jacqueline Hoskins-Wroten, and Loys Holland. 2011. "You Have to Hunt for the Fruits, the Vegetables": Environmental Barriers and Adaptive Strategies to Acquire Food in a Low-Income African American Neighborhood." *Health Education Behavior*. 28: 282-292.