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Fruits, Vegetables, and Seafood, Oh My! What Will Memphians Buy?: A Comparative Study of Shopping Habits and Food Access in Two Memphis Census Tracts

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Abstract

Food is undeniably one of the most important facets of daily life, not only due to its role in coping with or celebrating human emotions but also as a necessity of survival. However, the access and availability of food is not equal among populations, especially populations that are different in socioeconomic status. In this thesis, I ask and answer questions about the similarities and/or differences in the food choices, and the factors that contribute to these choices such as food access and accessibility, of two socioeconomically but geographically close census tracts in Memphis, TN. These food choices are framed in the context of healthy eating and the different influences that go into creating the concept of healthy eating.

Introduction

In this work I focus on whether food access, food choice, and food availability are similar and/or different between two socioeconomically different populations. To understand how the factors are shaped, I analyzed residents' income, geographical limitations, and the prices, varieties, and quality of foods offered in grocery stores. This work is also concerned with whether the residents of the census tracts practice eating healthy as defined by the United States Department of Agriculture, cultural constructions, personal viewpoints, or a combination of these ideas.

Literature Review

Dietary Guidelines

Dietary guidelines are composed by the USDA and the United States Department of Health and Human Services (HHS) in order to provide the public with recommendations on how to make their diets and daily lives healthy. Dietary guidelines recommend increasing intake of fresh fruits and vegetables, whole-grain products, seafood, lean meats, poultry, fat-free or low-fat milk, and fat-free or low-fat dairy products (USDA and HHS 2010). Fruit and vegetable consumption is important because these foods provide our bodies with magnesium, potassium, and vitamins A, C, and K while lean meats, seafoods, poultry, and protein foods provide vitamins B and E, and additional nutrients (USDA and HHS 2010). The American Heart Association also publishes its own dietary guidelines focused on heart health; their recommendations consist of reducing fats, cholesterol, salts and sodium, and sugars, while increasing fruits and vegetables, whole-grain and starch products, high fiber foods, lean meats, poultry, and seafood (AHA, 1996).

Perceptions of Eating Healthy

Valerie Richardson et al. (2009, p.50) use a definition provided by Duke University in her research of healthy eating perceptions stating, "'Healthy eating' is defined as how frequently you eat, the function food has in one's life, how one utilizes food and how one thinks about food". Perceptions of eating healthy are influenced by dietary guidelines, media, fads, culture, and personal preferences (Paquette, 2005). Food choices are influenced by individual assumptions about foods and whether they are contradictory to food rules or not, indicating control, power, knowledge, moral superiority,

high status, and restraint over one's own diet to produce a healthy body are extremely important concepts (Counihan, 1992; Paquette, 2005).

Food Trends: Fast Food/Restaurant Use

An extremely popular food trend today is consuming food away from the household at fast food/restaurant outlets (French et al., 2001). Fast food restaurants are known to feature high calorie and high fat foods at cheap, inviting prices, and regardless of dietary guidelines Americans are consuming this food at an increasing rate. The higher calorie and fat content of ubiquitous fast food has contributed to American obesity and health issues that have risen dramatically over the past few decades. Rates of fast food consumption and the geographical location for fast food restaurants are increased for non-white and low-income populations, but there have also been studies that reveal a lack of definitive evidence for relationships between fast food, race/ethnicity, and income (Block et al., 2004). As fast food chains are growing, expanding, and catering to customers' wants and needs, so are their menus; apple slices, salads, oatmeal, fat-free and low-fat milk, yogurt, and smaller kids portions are now common healthier menu options in chains such as McDonald's and Burger King.

Food in Low-Income Areas

Typically it has been shown that the foods, specifically fruits and vegetables, offered in low-income area grocery stores are commonly lower in quality and availability and higher in price, which often influences these residents to shop outside of their neighborhoods (Curtis & McClellan, 1995; Freedman & Bell, 2009; Goodman, 1968; Hendrickson et al., 2006; Valera et al., 2009). There is also research that addresses the belief that over time fruit and vegetable prices have increased while starch based and filler food prices have declined, which would greatly influence barriers to food availability and food access for lower income families (Curtis & McClellan, 1995). This finding suggests that lower-income families are at a greater chance to sacrifice fresh fruits and vegetables in their diet for more filling foods such as macaroni and rice. However, there has also been research that indicates that prices of commodities very seldom increase as the median income of surrounding families decrease and that prices of fruits and vegetables have actually experienced a price decline parallel with that of filler foods (Ambrose, 1979; Kuchler & Stewart, 2008). Low-income areas are not charged more for healthy or unhealthy food items based on their income levels but because of their available market-

place options (or a lack thereof).

Methodology

My research takes place in two Memphis census tracts 007200 and 007300 (Tract A and Tract B respectively) that are geographically close but socioeconomically and racially different; see Tables 1 and 2 (World Media Group, 2015) and Figures 1a and 1b.

Table 1: Income and Population Demographics

	Tract A	Tract B
Low-Income Population	248	681
Total Population	2,480	1,962
Poverty Rate	10.00%	34.70%
Median Household Income	$59,298	$21,711

Table 2: Racial Demographics

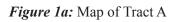|	Tract A	Tract B
Caucasians	92.10%	55.60%
African Americans	5.30%	37.40%
Hispanics	1.80%	2.10%
Asians	0.80%	3.80%

Figure 1a: Map of Tract A

Figure 1b: Map of Tract B

I created a map of the two census tracts overlain with 128 squares that measure roughly 400' by 400' on ground and contain approximately 20-25 houses from which I randomly selected a number of 4 or 5 squares per tract and went door-to-door with student volunteers, recruited from anthropology classes at the University of Memphis, with surveys. The survey was the primary method of data collection, each survey lasted approximately 10 minutes with 31 questions about food access, food choice, perspectives of eating healthy, and demographics. Groups of two volunteers,

with surveyor scripts and surveys, went door-to-door and asked residents if they were willing to participate in this research study after giving a verbal explanation of the study. I left a survey with willing residents, with an agreed scheduled pickup time, so that I could retrieve the completed survey if they did not wish to participate at that specific time due to time conflicts. Upon my return, if there was not a completed survey or note retracting their participation placed outside their residence in plain sight, I left a note indicating a new pick up date. The respondents were given two chances to place their completed surveys outside their apartment/house door for pickup. To ensure that as many residents as possible had a chance to participate, I varied the days and times the surveys were administered and we returned to each area at least twice.

After the survey process, respondents were asked to participate in an interview. The interview lasted approximately 20-25 minutes and consisted of 23 questions, featuring some of the same topics found in the survey but with more detail-oriented questions. A card with my information was left with the respondent if they did not want to participate in the interview at that specific time.

Methods of Analysis

I am operationalizing fast food consumption as an unhealthy eating behavior and consumption of organic foods as a healthy eating behavior based on embedded assumptions of the nutritional value of these foods. One reservation of this operationalization consists of a respondent answering that while eating at fast food venues they only consume salads, grilled chicken, and low-fat milk; if this is the case, fast food consumption will be recorded as healthy eating.

The survey data was input manually into Qualtrics, a software tool used to analyze data, and I compiled a Word document of descriptive statistics and a Word document of relevant information. Using the survey data and the relevant data document I created household level data summaries for every survey/household to improve my familiarity with the data as well as to help me identify potential relationships between data such as income and food choices, income and food access, and perceptions of healthy eating and food choices. In addition to these tools, I also used the USDA's Dietary Guidelines to operationalize eating a healthy versus unhealthy diet. For example, I focused on three types of food: vegetables, fruits, and fresh seafood as being a part of a healthy diet when comparing

the price, quality, and variety of frequently purchased foods across the tracts.

I used Google Map directions to evaluate the mean distances that residents have to travel to their frequently used grocery stores and fast food/restaurant outlets. These distances and times helped me to determine whether the tracts were traveling comparable distances to the stores and food outlets they were frequenting, indicating equal or unequal access. The directions show multiple travel distances and times to the destination, of which I took the average.

After completing this process for each of the household's frequented grocery stores I was able to arrive at final averages of distances and times traveled per household to frequented stores for the entire tract; I also used this process to get a final average of the distance and time traveled to frequented fast food/restaurant outlets for the entire tract.

Once this process was completed for each household I was able to calculate average distances and times to stores and food outlets to produce an average approximation for the distance and time it takes for the census tract as a whole to arrive at frequented stores and food outlets. After the calculations were completed for Tract A and Tract B, I was able to make comparisons in the distances and time traveled to both stores and food outlets.

There are some important reservations in the average distances and times the residents travel to their selected grocery stores and fast food/restaurants. Some of the survey respondents did not write down the specific store or food outlet that they frequent. In some instances this is not an obstacle because there is only one location in Memphis; such as RP Tracks. However, for stores such as Kroger and Fresh Market, and food choices like McDonald's and Chick-fil-A there are numerous locations that the residents could patronize. When there was not a specific address or location given for these types of businesses, I used Google Maps to find the location that was closest to the residents' households. Another reservation in this data is that I assumed the 'starting point' was the resident's household instead of another location such as their workplace or their personal preference, which would influence which store or food choice they frequent. Finally, the time it takes for residents to travel to their destinations will always be dependent on their travel speed and the amount of traffic or congestion.

While using Google Maps, I was able to view the descriptive cost of the resident's fast food/restaurant choices. I used this information to make descriptive averages of the approximate cost of the fast food/restaurant outlets the residents frequent per household and then for the census tract as a whole. A limitation of this approach is that Google Maps only provides price estimates on a 3 point scale while some fast food/restaurants do not have a cost designation. Furthermore, if a specific location/address is not given for a food outlet, I assumed the location of the fast food/restaurant outlet based on the closest distance to the resident's household.

By compiling the names of the stores and food products, I found the three most frequently visited stores for each of the two tracts and the three most frequently bought vegetables, fruits, and fresh seafood products. The two tracts share a common frequently used store (Kroger) meaning that I only traveled to five different stores instead of six different stores. I compared the prices for the most frequently purchased food items in Tracts A and B. This gave me the average prices for popular food products in each tract, which allowed me to see if there were price differences for the same products across the tracts. I made two trips to these stores several weeks apart in order to have a complete pricing data set not affected by sale/conditional prices. It is important to recognize that the prices, quality, and variety of fruits, vegetables, and seafood products are dependent upon factors such as seasonal availability, sales/specials, and the types of products the stores offer.

Furthermore, I used a TI-84 Plus graphing calculator to help determine if there were any correlations between factors such as a household's monthly income, a household's frequency of eating fast food, likelihood of purchasing organic foods, and the approximate distance traveled to grocery stores, fast food outlets, and restaurants. In order to do this, I coded resident's survey responses and data into exclusive digits. A 'yes' response to purchasing organic foods was coded as 1 while a 'no' was coded as 2, and a household with a monthly income of $1,200-$1,599 was coded as 8 while an income of $800-$1,199 was coded as 9, and so on. This process was carried out with other responses and data mentioned above such as approximate mileage to grocery stores, household monthly incomes, and the frequency of eating out. After each possible response was given an exclusive coded number, I graphed two factors of interest side by side and calculated their correlation to each other. I would then use the TI-84 Plus

calculator to calculate the amount of correlation. This process was carried out for all of the factors of interest to determine if any of these factors was impacted, affected, or predicted by another factor.

Statistics and Data

Demographics and Frequently Purchased Food Groups

As can be seen in Table 3 below, there are different racial makeups of the two tracts. Tract B has a lower number of Caucasians than Tract A but has a higher number of African Americans, Hispanics/Latinos, and Middle Easterners/Asians. A large proportion of survey respondents from Tract B were composed of Caucasians and Middle Easterners/Asians while almost all of the survey respondents from Tract A were Caucasians. Tract B respondents also had more diversity in their household monthly incomes, see Table 4 below. Interestingly, almost half of Tract B's respondents have household monthly incomes below $1,999 while more than half of Tract A's respondents have household monthly incomes of $4,000 or more. These monetary and financial differences materialize through how much of the household's monthly income is spent on groceries; 50% of Tract B's respondents spend below $350 per month for groceries while 50% of Tract A's respondents spend $501 or more per month on groceries; see Table 5 below.

Table 3: Racial Demographics of Surveys

	Tract A	Tract B
Caucasian	95% (20)	48% (19)
African American	5% (1)	5% (2)
Hispanic/Latino		3% (1)
Middle Eastern/ Asian		45% (18)

*21 answered from Tract A, 40 answered from Tract B; number of respondents in parentheses

Table 4: Household's Monthly Incomes

Monthly Income	Tract A	Tract B
$0-$399		3% (1)
$400-$799		5% (2)
$800-$1,199	5% (1)	8% (3)
$1,200-$1,599		18% (7)
$1,600-$1,999	11% (2)	13% (5)
$2,000-$2,399	5% (1)	
$2,400-$2,799		8% (3)
$2,800-$3,199	5% (1)	11% (4)
$3,200-$3,599	5% (1)	11% (4)
$3,600-$3,999	5% (1)	3% (1)
$4,000 or more	63% (12)	21% (8)

*19 answered from Tract A, 38 answered from Tract B; number of respondents in parentheses

Table 5: Household's Monthly Income Spent on Food

Monthly Spending	Tract A	Tract B
$51-$100		3% (1)
$101-$150		13% (5)
$151-$200	6% (1)	8% (3)
$201-$250	11% (2)	3% (1)
$251-$300	11% (2)	15% (6)
$301-$350		8% (3)
$351-$400	6% (1)	10% (4)
$401-$450	17% (3)	8% (3)
$451-$500		13% (5)
$501-$550	6% (1)	5% (2)
$551-$600	6% (1)	3% (1)
$601 or more	39% (7)	13% (5)

*18 answered from Tract A, 39 answered from Tract B; number of respondents in parentheses

Frequently Purchased Foods

Both Tracts A and B have many common frequently purchased food groups in which five food groups are identically ranked: fresh fruits, fresh vegetables, chicken products, dairy products, and snack foods, see Tables 6a and 6b below. The two tracts also share identical fresh fruits and fresh seafood choices, see Table 7 and 9 below, but different fresh vegetable choices, see Table 8 below. The respondents also frequent different grocery stores but the underlying reasons of grocery store choice are very similar, most being attracted by the close location, quality of food, and cheap product prices, see Table 10 and 11 below.

Table 6a: Frequently Purchased Food Groups for Tract A

Tract A	
Fresh Fruits	95.24% (20)
Fresh Vegetables	90.48% (19)
Dairy Products	76.19% (16)
Chicken	76.19% (16)
Snack Foods	66.67% (14)
Frozen Fruits & Vegetables	66.67% (14)
Red Meat	61.90% (13)
Canned Fruits & Vegetables	61.90% (13)
Fresh Seafood	42.86% (9)
Frozen Seafood	38.1% (8)
Canned Seafood	28.57% (6)
Frozen Meats	23.81% (5)
Other	23.81% (5)

Table 6b: Frequently Purchased Food Groups for Tract A and Tract B

Tract B	
92.5% (37)	Fresh Fruits
87.5% (35)	Fresh Vegetables
77.5% (31)	Dairy Products
65% (26)	Chicken
57.5% (23)	Snack Foods
47.5% (19)	Red Meats
45% (18)	Frozen Fruits & Vegetables
35% (14)	Fresh Seafood
30% (12)	Canned Fruits & Vegetables
22.5% (9)	Some Other Food Group
12.5% (5)	Frozen Meats
10% (4)	Frozen Seafood
7.5% (3)	Canned Seafood
2.5% (1)	Canned Meats

*Tract A had 5 non-specific answers, tract B had 9 non-specific answers; number of respondents in parentheses; each respondent allowed to answer with more than one category

Table 7: Top 3 Frequently Purchased Fresh Fruits for Tract A and Tract B

Tract A			Tract B	
Apples	100% (20)		Bananas	48.6% (18)
Bananas	65% (13)		Apples	48.6% (18)
Oranges	45% (9)		Grapes	29.7% (11)

*20 answered from Tract A with 4 non-specific answers, 37 answered from Tract B with 13 non-specific answers; number of respondents in parentheses

Table 8: Top 3 Frequently Purchased Fresh Vegetables for Tract A and Tract B

Tract A			Tract B	
Lettuce	36.8% (7)		Tomatoes/ Potatoes	25.7% (9) each
Onions	31.6% (6)		Carrots	20% (7)
Tomatoes/ Broccoli	26.3% (5) each		Peppers	20% (7)

*19 answered from Tract A with 5 non-specific answers, 35 answered from Tract B with 12 non-specific answers; number of respondents in parentheses

Table 9: Top 3 Frequently Purchased Fresh Seafood for Tract A and Tract B

Tract A			Tract B	
Salmon	55.56% (5)		Salmon	35.7% (5)
Tuna	55.56% (5)		Shrimp	28.6% (4)
Shrimp	33.33% (3)		Catfish	21.4% (3)

*9 answered from Tract A with 2 non-specific answers, 14 answered from Tract B with 7 non-specific answers; number of respondents in parentheses

Table 10: Top 3 Frequently Used Grocery Stores for Tract A and Tract B

Tract A		Tract B	
Kroger	95.2% (20)	Kroger	100% (40)
Fresh Market	47.6% (10)	Walmart	22.5% (9)
Whole Foods	38.1% (8)	Aldi's	17.5% (7)

*Number of respondents in parentheses; respondents allowed to answer with more than 1 store

Table 11: Reasons Why Grocery Stores are Chosen

	Tract A	Tract B
Close Location	100% (21)	88% (35)
Quality of Food	71% (15)	63% (25)
Cheap Prices	38% (8)	58% (23)
Good Sales	33% (7)	33% (13)
Other	10% (2)	20% (8)

*Number of respondents in parentheses; respondents allowed to answer with more than 1 reason

Fast Food and Restaurant Consumption

Around half of the fast food/restaurant outlets in both tracts fall into the moderately priced category, see Table 12 below. The two tracts also eat the same types of foods with ethnic foods being number one and salads, sandwiches, and hamburgers/cheeseburgers all being similar in percentages, see Table 13 below.

Table 12: Descriptive Price of Fast Food/Restaurant Outlets in Tract A and B

	Tract A	**Tract B**
$	31.48% (17)	45.9% (34)
$$	51.85% (28)	50% (37)
$$$	5.56% (3)	

*Number of food outlets in parentheses; 6 places unidentified in Tract A, 3 places unidentified in Tract B; respondents allowed to answer with more than 1 outlet

Table 13: Top 5 Foods Consumed While Eating Out/Getting Takeout in Tract A and Tract B

Tract A			**Tract B**	
Ethnic Foods	90% (19)		Ethnic Foods	65% (26)
Sandwiches	38% (8)		Fried Chicken	43% (17)
Salads	33% (7)		Sandwiches	40% (16)
Hamburgers & Cheeseburgers	24% (5)		Hamburgers & Cheeseburgers	33% (13)
Fried Foods	24% (5)		Salads	30% (12)

*Number of respondents in parentheses; respondents allowed to answer more than 1 food

Perceptions of Eating Healthy

Eating a well balanced diet of vegetables, fruits, a variety of proteins, fewer processed and fewer preservative-filled foods, fresh foods, and foods with low salt and fat content are some of the ideas and concepts that Tract A's residents have of what eating healthy is. Similarly Tract B's residents view eating enough vitamins/nutrients, vegetables, a well-balanced diet, proteins, watching calorie and fat intake, fewer sweets/sugars, and avoiding red meats as being associated with eating healthy, see Table 14 below.

Table 14: Perceptions of Eating Healthy in Tract A and Tract B

Tract A		Tract B	
Eating a Well-balanced Diet	52.38% (11)	Eating Enough Nutrients/Vitamins	26.3% (10)
Eating Vegetables	42.9% (9)	Eating Vegetables, Eating Well Balanced Diet	23.68% (9) each
Eating Fruits	33.33% (7)	Eating Proteins	21.05% (8)
Eating a Variety of Proteins	28.57% (6)	Eating No Sweets/ Sugars and Watching Daily Calorie and Fat Intake	18.4% (7) each
Eating Unprocessed Foods, Foods with Less Preservatives	23.8% (5)	Eating Fruits	13.16% (5)
Eating less salt, low/ less fat, and more fresh foods	19% (4) each	Avoiding Red Meats	10.5% (4)
Eating Moderate to Small Portions	14.29% (3)	Eating Carbs, Knowing What to Eat and When to Eat, Eating Smaller Portions, and Eating Unprocessed Foods	7.89% (3) each
Eating Less Sugar and Less Red Meat	9.5% (2) each	Eating Low Salt Foods, Eating Foods with No Additives/ Preservatives, Eating Organic Foods, and Eating Dairy Products	5.26% (2) each
Eating Fewer Fried Foods, Consuming less Caffeine, Having Adequate Fiber Intake, Eating Organically Raised Meats, and Providing Body with Nutrients	4.76% (1) each	Eating Low Carbs, Something You Should Do, Drinking Water	2.63% (1) each

*21 answered from Tract A, 38 answered from Tract B; number of respondents in parentheses; respondents allowed to answer with more than one definition

Prices of Frequently Purchased Food Items

The prices of 'fresh' seafood products are higher in tract A than in Tract B while the prices for organic and non-organic fruits and vegetables are cheaper for Tract B's residents, see Tables 15, 16, and 17 below.

Table 15: Average Price for Top 3 Fresh Seafood Products in Tract A and Tract B

	Tract A	**Tract B**
Tuna Steaks	$18.32/lb ($\sigma$= $6.13)	$13.99/lb
Atlantic Salmon	$9.99/lb ($\sigma$= $1.63)	$7.99/lb
Shrimp	$14.49/lb ($\sigma$= $2.06)	$12.49/lb ($\sigma$= $0.50)
Catfish	$7.99/lb	$7.99/lb

*Average approximate prices; stores chosen based on closest distance to residence if specific store/address not given

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Table 16: Average Prices for Top 3 Fruits (Non-Organic and Organic) for Tract A and Tract B

	Tract A	Tract B
Apples	Singles $1.81/lb, σ= $0.53; (Organic $2.32, σ= $0.41)	Singles $1.58/lb, σ= $0.09; (Organic $2.14, σ= $0.14)
	3lb Bag $6.24, σ= $1.78; (Organic $6.87, σ= $1.34)	3lb Bag $3.88, σ= $0.92; (Organic $5.74, σ= $0.24)
Bananas	$0.62/lb, σ= $0.04	$0.53/lb, σ= $0.08
	(Organic $0.79/lb, σ= $0.08)	(Organic $0.69/lb, σ= $0.01)
Grapes	Seedless $3.99/lb	Seedless $4.66/lb, σ= $1.34
	(Organic Seeded $4.99/lb)	2lb Bag $3.59, σ= $0.39
Oranges	Singles $1.33/lb, σ= $0.24	Singles $1.25/lb, σ= $0.25
	(Organic $1.82/lb, σ= $0.62)	(Organic $0.99)
	4lb Bag $4.49, σ= $0.50	4lb Bag $3.32, σ= $0.94
	(Organic $6.24, σ= $0.25)	(Organic $6.70, σ= $0.23)
Straw-berries	1lb $5.49, σ= $0.50	1lb $3.99, σ= $1.00
	(Organic $6.99)	
Blue-berries	6oz $3.99	6oz $3.99
	(Organic $4.49, σ= $0.50)	(Organic $4.73, σ= $0.26)
	16oz $4.74, σ= $0.25	16oz $3.49, σ= $1.00

*Average approximate prices; stores chosen based on closest distance to residence if specific store/address not given; organic prices in parentheses

Table 17: Average Prices for Top 3 Vegetables (Non-Organic and Organic) in Tract A & Tract B

	Tract A	Tract B
Lettuce	Head $1.89, σ= $0.54; (Organic $2.99) 8oz Shredded Bag $1.85, σ= $0.04	Head $0.99, σ= $0.14; (Organic $2.77, σ= $0.22) 8oz Shredded Bag $1.84, σ= $0.05
Onions	Singles $1.27/lb, σ= $0.27; (Organic $1.73/lb, σ= $0.21) 3lb Bag $2.69; (Organic $4.39, σ= $0.80)	Singles $1.30/lb, σ= $0.29; (Organic $1.84/lb, σ= $0.25) 3lb Bag $2.29, σ= $0.40; (Organic $3.38, σ= $0.38)
Broccoli	$1.87/lb, σ= $0.21; (Organic $2.92/lb, σ= $0.33)	$1.66/lb, σ= $0.21; (Organic $2.64/lb, σ= $0.14)
Tomatoes	$2.55/lb, σ= $0.98; (Organic $3.87/lb, σ= $0.54)	$2.24/lb, σ= $0.42; (Organic $3.49/lb, σ= $0.50)
Potatoes	Singles $0.99/lb; (Organic $1.89/lb, σ= $0.37) 5lb Bag $3.49, σ= $0.50; (Organic $6.74, σ= $0.43)	Singles $0.99/lb; (Organic $2.19/lb, σ= $0.30) 5lb Bag $2.98, σ= $0.77
Carrots	Singles $0.69/lb; (Organic $0.99/lb) 1lb Bag $0.99; (Organic $1.49)	Singles $0.66/lb, σ= $0.03 1lb Bag $0.89, σ= $0.10; (Organic $0.98)
Peppers	Singles $2.02 ea., σ= $0.90; (Organic $3.62 ea., σ= $1.27) Pkg Trio $4.99 (Organic $5.99)	Singles $1.40 ea., σ= $0.44; (Organic $2.21ea, σ= $0.93) Pkg Trio $3.22, σ= $1.36
Spinach	Bundled $1.79 ea., σ= $0.20; (Organic $2.25 ea., σ= $0.25) 10oz Bag $2.59	Bundled $1.59 ea.; (Organic $1.99 ea.) 10oz Bag $2.49, σ= $0.10

*Average approximate prices; stores chosen based on closest distance to residence if specific store/address not given; organic prices in parentheses

Tract B's residents have to travel an approximate 1.37 miles and 3.03 minutes longer than Tract A's residents to arrive at their top three frequented grocery stores, see Table 18 below.

Table 18: Average Distances & Times to Top 3 Frequented Grocery Stores in Tract A & Tract B

Tract A		Tract B	
Tract A		**Tract B**	
Kroger	1.13 miles (σ= .21 mi.); 3.62 minutes (σ= 1.11 min.)	Kroger	1.19 miles (σ= .6 mi.); 4.51 minutes (σ= 1.38 min.)
Fresh Market	2.89 miles (σ= .4 mi.); 6.99 minutes (σ= .84 min.)	Walmart	7.53 miles (σ= .03 mi.); 16.96 minutes (σ= .46 min.)
Whole Foods	4.23 miles (σ= .39 mi.); 11.57 minutes (σ= .32 min.)	Aldi's	3.64 miles (σ= .33 mi.); 9.80 minutes (σ= 1 min.)
Top 3 Frequented Stores	2.75 miles (σ= 1.7 mi.); 7.39 minutes (σ= 3.26 min.)	Top 3 Frequented Stores	4.12 miles (σ= 2.61 mi.); 10.42 minutes (σ= 5.1 min.)

*Average distances and times; stores chosen based on closest distance to residence if specific store/address not given

Discussion

My research indicates that Tracts A and B share many of the same food shopping characteristics such as their fruit and vegetable choices, store choice, traveling distances to grocery stores, and perceptions of what eating healthy means. Through the data collected it can be determined that there are no significant inequalities between the *quality* of produce products or the *traveling distances* to grocery stores or fast food/restaurant outlets. While there are differences in the *availability* of produce (organic and non-organic) and seafood, these differences were not statistically significant.

Both sets of residents say that they participate in a healthy eating lifestyle based on their individual definitions of what eating healthy is as well as definitions created by national health organizational definitions, such as the USDA and AHA. The ease of transportation allows both tracts the opportunity to participate in a diet/lifestyle consisting of quality fruits, vegetables, dairy products, seafood, and poultry. In terms of food access, each tract has access to supermarkets and grocery stores at close distances that feature healthy foods. The USDA's definition of food choice consists of choices being determined by factors such as product prices, family structure, nutritional information and time constraints.

Interestingly, there are some large differences in the average *prices* of fruits, vegetables, and seafood between the stores that the two tracts patronize. It is apparent that the food choices of Tract B's respondents are influenced by the price of the products they are consuming because of the distance they travel outside of their census tract to get to low priced stores like Walmart and their frequent use of low priced stores inside their tract like Aldi's. Tract A's residents frequent higher priced stores for their higher quality foods and 'fresh' seafood counter that makes the seafood appear fresher and healthier.

Both tracts report that they purchase and consume fruits, vegetables, and seafood on a regular basis, and, perhaps because they share a commonly frequented store (Kroger), both tracts have very similar rates of food availability. In these particular tracts, no strong correlations were found between factors like a household's monthly income, how much is spent on food monthly, if a household purchases organic foods, how often a household goes out to eat or gets takeout, or the distance they travel to grocery stores and fast food/restaurant outlets. The highest correlation was a 0.21 between a household's monthly income and how often they eat out or get takeout, which indicates that there is not even a moderate relationship between the two factors. These low rates of correlation are likely due to the wide diversity and equality of responses; there were no data trends that could be followed. A household that makes $2,000-$2,399 monthly has just as much of an opportunity to purchase organic foods as a household that makes $4,000 or more monthly. Similarly, a household from Tract A has approximately the same traveling distances as a household from Tract B regardless of external factors.

Conclusion

Residents of Tracts A and B share many of the same food shopping characteristics. Amongst their similarities are their fruit and vegetable choices, a store choice, traveling distances to grocery stores, and perceptions of what eating healthy means. Through the data collected it can be determined that there are no significant inequalities between the quality of produce products or the traveling distances of grocery stores or fast food/restaurant outlets. While there are some differences in the availability of some produce, organic and non-organic, these are few and far between and are not very significant to the ability of residents to still purchase and consume produce products. The data does suggest that Tract A residents, the higher income tract, are paying more for their fruits, vegetables, and seafood products. Both sets of residents participate in a healthy eating lifestyle based on their own personal and individual definitions of eating healthy as well as organizational and professional definitions. These two tracts have a seemingly positive relationship with food and do not experience a lack of food access or food availability. Overall, it seems that the literature describing low-income populations as being at a disadvantage compared to middle or high income populations in terms of being able to access affordable and quality of fruits and vegetables at a close distance to their residence is not apparent in my research. It is important to note, however, that these results are not representative of Memphis as a whole and that these results may not be replicated with other tracts.

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