

FOOD ACCESS ON CAMPUS: A PLACE BASED SOCIO-SPATIAL METHOD
TO MEASURE STRUCTURAL BARRIERS WITHIN THE
CAMPUS FOOD ENVIRONMENT

A THESIS

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ABSTRACT

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FOOD ACCESS ON CAMPUS: A PLACE BASED SOCIO-SPATIAL METHOD TO MEASURE STRUCTURAL BARRIERS WITHIN THE CAMPUS FOOD ENVIRONMENT

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This study conceptualizes and pilot tests a place based socio-spatial method to measure food access on a university campus. Using a sociological case study, mixed-methods approach, this study combines spatial and ethnographic data collection methods and analytical strategies to describe structural barriers to food access on campus and within a quarter-mile walking distance from university housing. Spatial data, ethnographic data, and retail food establishment inventory results from the *Infrastructure Pedestrian Network Observation Tool* and *Campus Food Environment Measure* suggest three major areas of concern foods for students who live in university housing: (1) physical lack of access to food on campus, (2) food on and in proximity to campus is expensive, and (3) a serious lack of healthy and culturally appropriate. The Campus Food Environment Measure and inventory tools are available for use.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	iii
ABSTRACT	iv
LIST OF TABLES	ix
LIST OF FIGURES	x
Chapter	
I. HUNGRY FOR AN EDUCATION	1
Introduction	1
Background	2
Purpose	3
Problem Statement	4
Rationale.....	5
Thesis Organization	6
II. LITERATURE REVIEW	7
Defining Conceptual Constructs	7
Food Security and Food Insecurity	7
Social Structural Barriers to Food Insecurity Measures.....	8
Macro vs. Micro Focus	8
Defining Food Deserts and Food Swamps	9
Neighborhood Food Environment Structure	11
Walkability	12
Methods of Measurement	12
Measurement of Food Deserts	12
Geographical Information Systems (GIS)	13
College Student Food Insecurity	13
Rate of Food Insecurity among College Students	13
Barriers to Food Security and Food Access	14
High Cost of Attending College	14
Student Housing Factors	15

Student Transportation	16
Student Income and Employment	16
Adverse Health and Academic Consequences	17
Health Status	17
Student Drop Out/Stop Rate	18
Academic Achievement	18
Theoretical Orientation and Reflexive Statement	19
III. METHODOLOGY	23
Settings and Methods	26
Place Based Constructs	27
Walking and Fixed Spatial Distance	28
Study Design	30
Research Question and Potential Sub-Questions	30
Phenomenon and Participant Selection	30
Data	31
Field Site Selection	31
Sociological Case Study Data Collection	32
Online Data Collection.....	32
Ethnographic Data Collection Methods	36
Ethnography	36
Spatial Data Collection Methods	38
Measurement Instruments: Campus Food Environment Measures	38
Inventory Tools.....	39
Campus Food Environment Measure-Store Inventory	39
Campus Food Environment Measure-Restaurant Inventory	39
Campus Food Environment Measure-Vending Inventory	39
Campus Food Environment Measure-Pedestrian Observation Tool	40
Spatial Data Analysis Campus Food Environment Measure	40
Spatial Food Proximity and Density	40
Spatial Food Variety	41
Spatial Food Diversity	42
Ethnographic Data Analysis	42
Limitations	42

IV. CASE STUDY AT TEXAS WOMAN’S UNIVERSITY	
DENTON CAMPUS	43
Denton, Texas History	43
Food Insecurity in North Texas	44
Texas Woman’s University	46
Texas Woman’s University Campus Housing	50
On Campus Housing	51
Nelda C. Stark Residence Hall	51
John A. Guinn Residence Hall	52
Mary Gibbs Jones Hall	53
Lowry Woods Community	54
Grove Street Apartments	56
Off Campus Housing	57
TWU Select at Austin Place	58
TWU Select at Austin Villas	59
TWU Select at Bent Tree	60
TWU Select at La Maureta	61
TWU Select at Lone Star.....	62
TWU Select at the Vineyard	63
TWU Select at Withers Place	64
On Campus Food Retail Establishments	65
Baker’s Dozen	65
Chick-fil-A	66
Campus Bookstore	67
The Garden Room	68
The Underground	70
Java City	71
C3@ the Commons	72
Which Wich	73
Campus Vending Locations	74
Off Campus: Neighborhood Food Retail Establishments	76
CVS Pharmacy	77
Gana Shell Gas Station	78
Giuseppe’s Italian Restaurant	78
Guatelinda Café	79
Johnny Joe’s Quick Stop	79
Lenny’s Subs	79
Natural Grocers	80
Pizza Hut	80
Pizza Patron	80
Walgreens	80

V. FINDINGS	81
Ethnographic Findings	81
Inconsistencies in Educational Stickers	81
Inconsistencies in the Identification of Healthy Choices	83
Pedestrian Structural Barriers to Food Access	84
Spatial Accessibility and Availability Findings	89
Density Findings	90
Spatial Food Variety Findings	90
Spatial Food Diversity and Proximity Findings	91
Document Analysis Findings	95
University Housing Residency Requirements	95
Residential Segregation by Classification	97
External Environmental Structure-Student Place of Origin	98
Residence Hall Regulations: Cooking Policy Inconsistencies	99
Inconsistency, Average Cost of Fast Food versus Buying a Meal Plan....	101
VI. DISCUSSION AND RECOMMENDATIONS	104
Significance to the Discipline of Sociology	105
Significance to Case Study Participants.....	106
Recommendations	108
Place-Based Policy Recommendations	108
University Based Hunger Initiatives	108
Local, State, and Federal Hunger Initiatives	109
Implications for Future Research.....	110
Conclusion.....	111
REFERENCES.....	112
APPENDICES	
A. Definitions of Food Establishments.....	130
B. Campus Food Environment Measure: Vending Inventory.....	134
C. Campus Food Environment Measure: Restaurant Inventory	139
D. Campus Food Environment Measure: Store Inventory	143
E. Campus Food Environment Measure: Pedestrian Observation Tool.....	148
F. IRB Approval Letter.....	153

LIST OF TABLES

Table	Page
3.1 Locating Public Documents Online	33
4.1 Texas Woman’s University-Denton Campus Undergraduate Enrollment	47
4.2 Texas Woman’s University-Denton Campus Enrollment by Classification ...	47
4.3 Texas Woman’s University-Denton Campus Enrollment by Ethnicity	47
4.4 Texas Woman’s University-Denton Campus Enrollment by Residence	48
4.5 Texas Woman’s University-Denton Campus Enrollment Top Counties	48
4.6 Denton Campus Buildings and Abbreviations	49
4.7 Hours of Operation for The Baker’s Dozen	66
4.8 Hours of Operation for Chick-fil-A	67
4.9 Hours of Operation for the Campus Bookstore	68
4.10 Hours of Operation for the Garden Room.....	70
4.11 Hours of Operation for the Underground.....	71
4.12 Hours of Operation for Java City.....	72
4.13 Hours of Operation for C3 @ The Commons	72
4.14 Hours of Operation for Which Wich	74
5.1 Foods Labeled as Healthy Choices in Campus Vending Machines	84
5.2 University Residences and Number of Food Establishments by Type.....	91
5.3 Enrollment by Texas County of Origin and Rate of Food Insecurity.....	99
5.4 Average Cost for Campus Meal Plan and Local Fast Food	103

LIST OF FIGURES

Figure	Page
2.1	Creating a Campus Food Access Research Project 22
3.1	Conceptual Framework for Food Access 25
4.1	Texas Woman’s University Campus Map..... 45
4.2	Guinn Hall and Stark Hall 51
4.3	Jones Hall 53
4.4	Vending Area in Jones Hall..... 54
4.5	Vending Machines in Jones Hall 54
4.6	Lowry Woods Community 54
4.7	Grove Street Apartments 56
4.8	Austin Place Apartments 58
4.9	Austin Villas Apartments 59
4.10	Bent Tree Apartments 60
4.11	La Maureta Apartments..... 61
4.12	Lone Star Apartments 62
4.13	Vineyard Apartments 63
4.14	Withers Place Apartments 64
4.15	Student Union Building..... 65
4.16	Baker’s Dozen Food Counter 65
4.17	Chick-fil-A Food Counter 66
4.18	Snack Foods Sold in the Bookstore 67
4.19	Heat-Then-Eat Foods Sold in the Bookstore..... 67
4.20	Retail Stands 68

4.21	Tortilla Fresca.....	68
4.22	Grille Works	68
4.23	Toss it Up	68
4.24	Sushic Counter.....	69
4.25	Cafeteria Dining Area	70
4.26	Cafeteria Entrance.....	70
4.27	MCL Building.....	71
4.28	Java City.....	71
4.29	CFO Tower Building	72
4.30	Which Wich Counter	73
4.31	Refrigerated Case.....	73
4.32	HBD Vending Area	75
4.33	CFO Vending Area	75
4.34	Jones Hall Vending Area.....	75
4.35	ASB Vending Area	75
4.36	OBM Vending Area.....	76
4.37	Library Vending Area	76
5.1	Nutrition Facts	82
5.2	Balanced Choices.....	82
5.3	Choice Plus Snacks	83
5.4	Balanced Choices Vending Sticker	83
5.5	Intersection of University Drive and North Locust Street	85
5.6	Intersection at Administration Drive and North Bell Avenue.....	86
5.7	Student Paved Walkway.....	86
5.8	Crossing at MCL.....	86
5.9	Missing Pieces of Sidewalk.....	88

5.10	Oakland Avenue.....	88
5.11	Overgrown Landscaping	88
5.12	North Austin Street	88
5.13	Crossing Sign.....	89
5.14	My \$15.08 Lunch.....	102

CHAPTER I

HUNGRY FOR AN EDUCATION

INTRODUCTION

If knowledge is the light of life, how do hungry students navigate through murky food-swamp waters to emerge and find the light? Access to adequate quantities of quality food should be a basic human right (Eide *N.d*). Yet, food access inequalities exist across the United States (Coleman-Jensen, Gregory, and Singh 2014). Food access inequalities and hunger are rampant in Texas, the third highest rate in the nation (Feeding America 2015). In Denton County, 115,590 residents are at risk for hunger because they lack access to adequate quantities of food (Feeding America 2015b). Universities are not exempt from this trend (Gallegos, Ramsey, and Ong 2014). Food access inequalities impact both students and the university as a whole. Students with less access to healthy foods experience poor overall health status and impaired concentration (Gallegos et al. 2014; Skalicky et al. 2006; Maroto 2013). Coupled with financial difficulties (a significant contributing factor contributing to food insecurity in the first place), lack of food access leads to lower grade point averages (Patton-López et al. 2014), higher rates of study deferments (Gallegos et al. 2014), and higher drop-out rates before completing a degree (Orszag, Orszag, and Whitmore 2001), subsequently impacting a university's retention and graduation rates.

BACKGROUND

Texas is agriculturally abundant, yet despite this agricultural wealth, one in five Texans lives in poverty and is at risk for hunger (Texas Food Bank Network 2015). College students are not immune to this problem (Gallegos et al. 2014). The financial hardship from paying to attend a university (i.e. tuition, textbooks, housing) can increase budgetary demands that compete with food-buying power (Robb, Moody, and Abdel-Ghany 2012). Yet assuming that food insecurity among students is solely the result of relative poverty associated is too simplistic (Hughes et al. 2011). Therefore, while the rate of food security is an important indicator for identifying a household's economic access to food, by definition, this food security measure is not an accurate individual measure for the special population "college students" (Coleman-Jensen, Gregory, and Rabbit 2014). According to the United States Department of Agriculture (USDA) (2013), a household is defined as "a group of related or unrelated individuals who are not residents of an institution or boarding house but who are living as one economic unit. This means they generally reside in the same house and share expenses such as rent, utilities and food." The USDA's (2013) definition specifically excludes individuals such as college students who reside in university housing. Further, the current annual survey methods and questions the USDA uses are written to collect data on the household level and cannot accurately collect data for an individual college student who resides in university housing. For example, the USDA administers a survey to one adult respondent within a household. This adult answers survey questions such as,

In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (Yes/No).

In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (Yes/No).

(Coleman-Jensen et. al. 2014:3).

Additionally, their exclusive measure of financial access does not take into consideration the physical/geographic access to food environments (Bastian and Coveney 2013; French 2014).

Access to food within the geographical construct of the campus food environment is crucial for identifying structural facilitators and barriers to health for college students. Thus I propose a method to measure food access at the campus level that incorporates both sociological and spatial perspectives, which is necessary to change the general consensus that being "impoverished and hungry" is an acceptable part of the "student experience" (Chaparro et al. 2009). This study is an ethnographic account of food access at one Texas University. The guiding research question asks if the students who reside in campus housing have access to food within a reasonable walking distance of one-quarter mile.

PURPOSE

The purpose of this thesis is to examine and describe the social-spatial context of food access barriers within the food environment structure of a university setting for undergraduate students who live in university housing. To accomplish this objective, I examined the literature on the subject of food access inequalities to identify potential

spatial and structural facilitators that became the basis in my formulation of a method of measurement. Second, I developed tools to identify and describe food access points on and near campus. Third, I conducted an ethnographic socio-spatial analysis of potential food access for residential Texas Woman's University students to examine structural barriers to the physical availability of food within the campus food environment.

PROBLEM STATEMENT

An abundance of research regarding the determinants of household food insecurity has been conducted on the national and state levels. However, there is a scarcity of research at the county or campus level in North Texas, resulting in a limited understanding of campus-level indicators and determinants of food access inequalities. This limited information reinforces barriers between hunger relief initiatives and food insecure students. Access to food, water, and shelter are basic life necessities. Structural facilitators and barriers (i.e., geographic location, local resources, regulations/policies) exist that can impact students' potential access to nutritious foods (French 2014). Food access inequalities may perpetuate the cycle of poverty, as evidenced by the correlation between food insecurity and reduced scholastic achievement.

The development of a campus food access tool serves multiple purposes at the individual student level, minimizing suffering through improvement of food access, as well as the institutional level, improved student satisfaction rates, improved graduation rates. Most post-secondary educational institutions have campus-wide strategic plans that center on the academic success of their students; however, if students lack access to food, they may also lack energy, and concentration, receive lower grades (Maroto 2013). Thus,

by exploring student food access, administrators can identify potential facilitators and barriers to academic success and design evidence-based policies and programs for their campuses (Maroto 2013).

RATIONALE

Food access inequalities may perpetuate the cycle of poverty as evidenced by the correlation between food insecurity and reduced scholastic achievement. By conducting an ethnographic analysis of food access within the campus food environment, this study has the potential to make both immediate (local) and long-term (academic community) applied contributions. Locally, the study will provide timely-localized campus based data for Texas Woman's University and the Denton community. The Texas Woman's University-Denton campus, which houses approximately 2050 students, is located in the center of a food desert according to the USDA's Food Desert Atlas (2015). The findings from this study can be used to identify potential policy interventions to improve food access for Texas Woman's University's residential students. Further, the data collected can be used to cultivate and strengthen institutional, civic, and business partnerships that will benefit the community and facilitate opportunities for experiential learning for future students.

Nationally, this study adds to sociological research in the area of food access inequality. Further, the campus food access measurement tool developed and tested in this study can be used by other clinical sociologists, poverty researchers, or administrators to analyze food access on their college or university campuses. While designing a universal measure of food access, appropriate for all studies, may not be

realistic endeavor (Forsyth et al. 2006), in this thesis, I propose that using this study's *Campus Food Environment Measure* will create a methodologically consistent foundation of evidence, aimed at studying the unique characteristics of student populations and access to food. I posit that the systematic definitions of metrics can facilitate inter-study comparability between campus food environment research findings at different colleges and universities. Thus, this study creates a way in which academic institutions measure the structure of food access on their campus and share design interventions.

THESIS ORGANIZATION

Similar to the structure of a building, this thesis was constructed based on sound principles, with attention to detail, to ensure not only its structural integrity of but also maximized use. The foundation of this thesis is illustrated in the first three chapters. I introduce the topic in the first chapter. In chapter two, I review the current literature on college food insecurity and food access measures and I explain the conceptual framework and methodological principles on which this thesis is built in chapter three. In chapter four, I describe the case study field site and findings, and in chapter five I present discussions and implications for practice. In chapter six I draw conclusions and present recommendations.

CHAPTER II

LITERATURE REVIEW

In this chapter, I review current literature on food insecurity, hunger, food access issues, and adverse consequences for college students.

DEFINING CONCEPTUAL CONSTRUCTS

Food Security and Food Insecurity

The U.S. Department of Agriculture (USDA) defines the term *food secure* to mean that “all household members had access at all times to enough food for an active, healthy life” (Coleman-Jensen et. al. 2013:2). Therefore, the term *food insecure* means that “at some time during the year household members were, at times, unable to acquire adequate food for one or more household members because they had insufficient money and other resources for food” (Coleman-Jensen et al. 2013:8).

In 1995, the USDA first measured *hunger*, a term that has been replaced with food secure/insecure, with the Core Foods Security Module (CFSM) (Eisenmann et al. 2011). The Current Population Survey (CPS) continues to use this 18-item survey module to measure a household’s food security status by classifying households as “food-secure” (affirmative responses to two or fewer questions) or “food-insecure” (affirmative responses to three or more questions) (Eisenmann et al. 2011). The most recent CFSM survey administered in 2013 identified determinants of food insecurity such as poverty and membership within certain population sub-groups (i.e. single parent households and

unemployed) (Coleman-Jensen et al. 2014). University and college students often fall into several of these sub-groups (Gallegos et al. 2014). Student food insecurity may also be a continuation of life the student lived before arriving on campus (Huffman 2014).

Social Structural Barriers to Food Insecurity Measures

While measuring the rate of food insecurity is an important indicator for identifying a household's access to food, the food security measure does not always paint an accurate picture of college students. For example, Coleman-Jensen (2010) identified several ways in which the USDA food security measure is overly conservative and underestimates individual household members, in particular women. Bastian and Coveney (2013) agree and add that the current measure of financial access does not consider physical access to food or the cultural appropriateness of food. In creating the *Campus Food Environment Measure*, I carefully define the constructs within the measurement tool to minimize the gender inequality perpetuated by the current food security scale, as well as to minimize faulty assumptions which tend to frame food insecure individuals as deviants in many cultures (Bastian and Coveney 2013).

Macro versus Micro Focus

Historically, the frameworks from which food insecurity was studied used a regional or national focus, with the goal of determining the aggregate quantities of food required to feed the population (IFAD *N.d.*). From this perspective, policy could be enacted to provide mechanisms to account for fluctuations in the national food supply to minimize macro-level food shortages (IFAD *N.d.*). However, the macro perspective provides an oversimplified picture. While it is possible for a nation to produce a

sufficient amount of food on an aggregate level, yet still have individual members of that nation who are hungry. The United States is an excellent example of this. Southern California is an agriculturally abundant area surrounded by low-income neighborhoods with households that cannot afford to buy the produce they grow (Bruno 2013). For example, food insecure 19-year-old Santa Ana College student, along with 90 other families, goes to his local church to get a free box of over-ripe but usable fruit and vegetables (Bruno 2013). The left-over produce is donated weekly by local growers and supermarkets because it is not sellable, but is edible (Bruno 2013). The 19 year old college student said,

I love the fresh produce, said the Santa Ana College student...it gives me energy for school. I usually use it to make juice or smoothies (Bruno 2013).

While studying the issue at a macro level is important, the exploration of food insecurity on a disaggregated, micro level can lead to both a specialized framework to examine food insecurity within the community at the household level and appropriated interventions (IFAD *N.d.*).

Defining Food Deserts and Food Swamps

The term *food desert*, is a spatial metaphor used to designate a geographic area where a group of people lack access to healthy foods (Shaw 2006). Access, depending on conceptualization, usually includes multiple factors such as physical and financial access to foods (French 2014). Similar to the objectives of this thesis, one of Hubley's (2011) goals was to develop a geographic model of food access in Maine. She began by mapping the locations of grocery stores in Maine, using GIS while also gathering food

availability data. Hubley (2011) used the *Nutritional Environment Measurement Survey* as a model to develop the *Maine Nutrition Environment Measure Survey*. The result of the research was a map of Maine that categorized food access risks for different communities (Hubley 2011).

Conversely, Rose et al. (2009) coined the spatial metaphor ‘food swamp’, to characterize geographic areas that do not necessarily lack access to food but rather have an overabundance of convenience and fast-food restaurants. Food sold in convenience and gas-station markets generally sell high-calorie, energy-dense, less healthy, junk food relative to healthier food options (Cooksey Stowers 2015). In these areas, the high proximity to fast-food and snack-foods inundates healthier options (Rose et al. 2009; Ver Ploeg 2010).

Previous research has demonstrated a strong relationship between geographic location and economic indicators to characterize populations at the national and sub national scale (Lobao, Hooks, and Tickamyer 2007; Slack et al. 2009). Geographic space has been recognized by many sociological researchers as a key indicator for the study of inequalities (Lobao and Saenz 2002; Tickamyer 2000). Lobao et al. (2007) stress the importance of studying the geographic space in which the respondents are located. Further, they suggest that, by examining geographic space, one can gain a greater understanding of the dynamic association by which geographic entities both shape and are shaped by stratification (Lobao et al 2007; Ray 2012).

Neighborhood Food Environment Structure

Local food environments can influence access to healthy foods for food-insecure households (Freedman and Bell 2009). Analyzing data from this perspective can provide insight into how residing in low-income, food-insecure neighborhoods shapes or constrains food insecurity (Freedman and Bell 2009). Bauer et al. (2012) conducted a cross-sectional, cohort study among 454 kindergarten students (99.3% were American Indian) across 14 schools on the Oglala Sioux Tribe Pine Ridge Reservation in South Dakota. These researchers concluded that families on the Pine Ridge Reservation used convenience stores as a staple for purchasing food. This practice is common in neighborhoods with little economic infrastructure. Similarly, Freedman and Bell (2009) concluded that among the low-income, food-insecure, minority community they studied, convenience stores were the most prevalent types of stores used to purchase food. Bauer et al. (2012) reported that children from food-insecure families consumed more convenience store food, pizza, and fried chicken than food-secure children. Freedman and Bell's (2009) research indicated that these convenience stores "did not sell at least one fresh fruit or vegetable, lean meats, low-fat milk, or whole grain breads" (Freedman and Bell 2009:831; Ray 2012).

Freedman and Bell (2009) extended the research on physical access to food through in-store observations and by collecting qualitative data from participants at farmers' markets in food insecure communities in Nashville, Tennessee. Fifty-four percent of the food-insecure participants reported to researchers that they did not have

access to fresh fruit and vegetables in their neighborhood (Freedman and Bell 2009). The study further stated that,

While it is advantageous to include multiple measures of food access in obesity and food security research, if resources are constrained, then measures of perceptions of food access may sufficiently capture important features of local food environments (Freedman and Bell 2009:835).

Walkability

Gordon et al. (2011) found that most people are willing to walk 0.25 mile to buy food. Gordon and colleagues (2011) used GIS to quantify “accesses” with a quarter-mile walking path by measuring the street network in all directions from a center point. NJ Transit (1994) reported that a reasonable walking distance varies by topography, feelings of safety, aesthetically pleasing environment, and feelings of security. Humantransit.org (2011) argued that temporal distance may be a more reliable estimate of walking distance as it factors in potential obstacles such as busy roads, traffic lights, intersection wait times, and pedestrian right-of-way cross walks. According to BART (1979), the average person walks approximately 225 feet per minute, thus a 0.25-mile (1320 feet) walk would be approximately 6-10 minutes.

METHODS OF MEASUREMENT

Measurement of Food Deserts

The USDA measures food access and identifies *food deserts* by measuring low-access census tracts. The USDA used a 0.5 kilometer grid as the foundation for its geographic unit of analysis. They then measured the distance from the closest grocery

store to a designated point within a neighborhood. Neighborhoods that fell outside of the specified boundary on the grid were marked as low-access areas (USDA 2015).

Geographical Information Systems (GIS)

GIS is a computer tool that can analyze spatial data that then can be interpreted through relationships among patterns that are displayed as visual data within a mapping platform (French 2014). The most commonly used mapping platforms include ESRI-Arc 10, Google Map Maker, and Policy Map. French (2014) asserted that GIS provides a way in which researchers can compile data to map locations to visualize patterns that exist in physical and social environments. For example, researchers can use GIS to “geolocate and map off-campus food retailers in relation to college and university campuses as part of the school’s total food environment” (French 2014).

COLLEGE STUDENT FOOD INSECURITY

Rate of Food Insecurity among College Students

Several studies addressing food insecurity have found a higher prevalence of food insecurity among college students compared with the general population (Patton-Lopez et al. 2014; Hughes et al. 2011; Chaparro et al. 2009). Gallegos et al. (2014) found food insecurity among Australian college students is five times that for the general population. A study in Oregon found that 59 percent of college students were food insecure (Huffman 2014; Patton-Lopez et al. 2014); similarly, 45 percent of students were food insecure in Hawai’i (Chaparro et al. 2009). Another Australian study found that 46.5 percent of students were food insecure (Hughes et al. 2011). Daniel Lopez-Cevallos, associate director of research at Oregon State University Center for Latino/a Studies and

Engagement said, “Based on other research that’s been done, we expected some amount of food concerns among college students. But it was shocking to find food insecurity of this severity” (Huffman 2014:1).

To date, no national study has measured the food insecurity rate among all college students in the U.S. However, Feeding America (the United States’ largest emergency food network) recently released a national report that included characteristics of their adult student clients. Feeding America (2015a) estimated that 1 in 10 (5.8 million) of their 46.5 million clients are adult students. This number includes approximately 25.6 percent of households with at least one child and at least one adult student (Feeding America 2014b). Further, 31 percent of survey participants reported choosing between paying for food or paying for education (Feeding America 2014).

BARRIERS TO FOOD SECURITY AND FOOD ACCESS

High Cost of Attending College

Multiple studies suggest that students experience increasing levels of “relative poverty” as a result of educational financial commitments, such as tuition, textbooks (Castillo 2013; Gallegos et al. 2014; Robb et al. 2012). Public college and university tuition costs have increased 27 percent within the last five years (Cruz 2014). Ferrette (2013) adds that many scholarships and grants are for tuition only and do not cover living expenses. Dechellis (2014) interviewed Lauren McDermott, Director of the Tiger Pantry at the University of Missouri, who said:

Today's students are tasked with earning perfect grades, being active with extracurricular and holding down a job. Tuition is rising. Cost of living is rising. Debt is growing. Everything is working against us...Food is a privilege. We hope to change the perception of hunger on campus and offer resources to students, faculty and staff so that they can focus on the experiences uniquely available at Mizzou...The Tiger Pantry is a non-judgment zone which provides food assistance for those in need within the university's community (DescHELLIS 2014:1).

Gallegos et al. (2014) found that student's with income in the lowest tertile versus students with higher incomes were 80 percent more likely to experience food insecurity. Robbins (2010) adds that on-campus meal plans are often cost-prohibitive to students trying to stretch financial aid dollars. Ferrette (2013:2) interviewed a student who said "He knows of a fair number of students who use up their campus meal plan before the end of the semester and can't afford to buy groceries through finals."

Student Housing Factors

Gallegos et al. (2014) conducted a cross-sectional, web-based survey of 810 students attending a metropolitan university in Australia. This study compared students who were living at home to those who boarded or rented. Data indicated that students who lived on campus or rented housing were more likely to experience food insecurity than those who lived at home (Gallegos et al. 2014). Researchers speculated that it is likely that students who do not live at home receive less family financial support (Gallegos et al. 2014). As a result, these students are more likely to work at least part-

time and or seek student loans, grants, and scholarships (Gallegos et al. 2014). Similarly, Chaparro et al. (2009) found higher rates of food insecurity among students who lived on campus or off campus with roommates versus students who lived with family members. Feeding America (2014a) measured their client's access cooking tools and cold food storage. For example, access to equipment to cook food such as a stove, microwave, or hot plate, and having a refrigerator can increase food utilization and food security (Feeding America 2014a).

Student Transportation

Maroto (2013) emphasized the correlation between food insecurity among students living on campus and limited transportation. For example, when students were asked why did they not have enough food, 23 percent reported lack of transportation to purchase food (Maroto 2013). Language barriers, particularly among international students, coupled with limited transportation were identified as barriers to food access (Maroto 2013). These international students may not know where to buy healthy affordable foods.

Student Income and Employment

Perhaps counter intuitively, employed students were twice as likely to report food insecurity (Patton-Lopez et al. 2014). This suggests that financial assistance and employment do not meet the financial demands of attending a university or college for some students (Patton-Lopez et al. 2014). For instance, Caitlin, a student at both the University of North Texas and Texas Woman's University, is a full-time student enrolled in 18 hours who also works at 12 hours a week at the Blagg-Huey Library at Texas

Woman's University (Sandoval 2014). Caitlin said, "I want to be grown up. I need to experience what adulthood is going to be like. My job is allowing me to have independence, but at the same time I'm suffering" (Sandoval 2014). Likewise, 64 percent of students reported that employment increased their stress level (Dundes and Marx 2006). Gallegos et al. (2014) add that students who worked additional hours reported having less time to prepare meals, which added to the cycle of food insecurity. Mangan, Hughes and Slack (2010) argued that the first step in alleviating food insecurity was to increase students' awareness of the financial and other support services available to them.

ADVERSE HEALTH AND ACADEMIC CONSEQUENCES

Tarrant County College (TCC) Chancellor Erma Johnson Hadley said people with resources sometimes can't grasp that college students don't have enough money for books, state-mandated shots or food (Smith 2012).

Health Status

Gallegos et al. (2014) reported that food insecure students were twice as likely to report fair or poor general health. Additional studies indicated that food insecurity was associated with adverse health outcomes such as anxiety, anemia, chronic illnesses, depression, and obesity (Skalicky et al. 2006). Megan Patton-Lopez, an epidemiologist at Benton County Health Services in Oregon and lead author for a student-focused food insecurity research said

Sixty two percent of the students reported they couldn't afford balanced meals.

The quality of their diet is being impacted. It appears that many of the students are struggling to buy the healthy foods like fruits and vegetables and lean meats and this could affect their weight, although our study cannot confirm that (Stifferlin 2014:1).

Student Drop Out/Stop Rate

Gallegos et al. (2014) reported that financial difficulties were a key factor in student drop-out or stop-out. Food insecure students reported that their studies had been compromised because of financial difficulties. Students who worked more than 20 hours a week were more likely to drop out of university or college before completing a degree (Astin 1993; Orszag et al. 2001). For example, Davis, a 20-year-old University of North Texas student, is a former art student from the prestigious Savannah College of Art and Design (Sandoval 2014). He was forced to drop out for financial reasons, despite receiving a financial aid award for athletics (Sandoval 2014). In addition to his studies, Davis has the physically demanding job of peddling people around Denton in a Pedicab (Sandoval 2014). According to Davis, "I never know how much I'm going to make. Usually it's enough to pay my rent, but it's not always enough to eat" (Sandoval 2014).

Academic Achievement

Food insecure students were three times as likely to have deferred their studies due to financial difficulties (Gallegos et al. 2014). Patton-Lopez et al. (2014) conducted a cross-sectional, non-probability survey of 354 college students. Their results suggest that food insecure college students were less likely to report a Grade Point Average (GPA)

greater than 3.1. Astin (1993) found that in addition to the likelihood for a lower GPA, students who worked more than 20 hours in off-campus employment tend to interact less with faculty and participate in campus life than students who worked fewer hours. Maroto (2013) found that food insecurity impacted concentration levels and energy. For example, Raelynn, a sophomore at the University of North Texas must work multiple jobs, despite receiving substantial scholarships and financial aid package that includes free tuition (Sandoval 2014). Raelynn described her exhausting schedule. It begins with working at a Denton pre-school from early in the morning to 4pm (Sandoval 2014). Then she walks to her second job at McDonalds, where she works from 5:00 pm to 11:00 pm and then goes home to study (Sandoval 2014). Raelynn expressed that the endless cycle of sleep deprivation impacts her ability to concentrate during her classes (Sandoval 2014). Unfortunately, this struggle landed her on academic probation and in jeopardy of losing her scholarship (Sandoval 2014). The defeated student admitted that

Honestly, part of me wanted to lose my scholarship because at least then it'd be over. It's just so hard to keep going sometimes. I didn't have much growing up. What keeps me going is the hope that when I have my own children, they will never know pain or hunger (Sandoval 2014).

THEORETICAL ORIENTATION AND REFLEXIVE STATEMENT

I identify as a pragmatic humanist qualitative researcher who approaches social research from a situationalist orientation. Therefore, the philosophical underpinnings from the philosophical traditions of humanism and pragmatism guide my ontological, epistemological, and methodological assumptions (Savin-Baden and Major 2013). For

example, based on the ontological and positional assumptions of the pragmatist perspective, I take a subjectivist position towards research based on the assumption that reality is constructed by individuals and is practical (Savin-Baden and Major 2013). From an idealistic/subjectivist stance, “reality is subjective and is constructed by individuals and groups...and the knowledge is the meaning that participants assign to their lives- A product of their mind gained by learning about knowledge they have” (Savin-Baden and Major 2013:57). This situationalist orientation drives my belief that no ideal philosophical paradigm exists to “fit” all research studies. As a result, I select a philosophical research stance based on the context of each individual study (Savin-Baden and Major 2013).

For example, in this thesis, I adopt the philosophical paradigm of pragmatism to locate myself and to guide the approach and selection of research methods. The unique needs of this study precipitated my decision for a mixed method approach. Qualitative approaches to research generally focus on emic perspectives and have a subjective and personal orientation (Savin-Baden and Major 2013).

My research has a personal orientation that I acknowledge is inherently subjective. My qualitative research focuses on understanding food access barriers that exist for students who reside in university housing. In general, I am less interested in quantitative research that aggregates humans to the point that the face of hunger is no longer visible. In my view, quantitative research can be valuable when gathered in conjunction with qualitative data. This type of mixed methods research extends data

beyond the analysis of variable relationships that test cause and effect but rather thick-descriptive localized data. Further, I draw from a non-positivistic experiential epistemological foundation that posits knowledge is gained by experientialism. In other words, humans gain knowledge from the dynamic process of experience, including observing humans and their artifacts within their environment (Savin-Baden and Major 2013).

I acknowledge that a researcher's opinions and beliefs may impact or bias their research. To counteract potential bias, I make a concerted effort to read current articles about qualitative research methods to add tools to my qualitative research tool-box. Elliott, Ryan, and Hollway (2012) view reflexivity as a resource in the production of knowledge. They use reflexive field notes as a tool for conceptualizing data in the co-created space of researcher and research (Elliott et al. 2012). I find that a reflexive research diary is a useful tool for practicing reflexivity. Reflective research diaries are used by researchers to write in their thoughts, feelings, and observations after conducting interviews or observations (Walker, Read, and Priest 2013). In addition to reflection, I find that the diary is also helpful in keeping my, "don't forget about this" Post It notes that previously I had stuck to everything.

In sum, I approach research from a humanist and pragmatic perspective. From this perspective, I adopt the roles of participant and observer (Savin-Baden and Major 2013). Further, the philosophical paradigm of Humanism shapes the primary goal of my research/social action. I illustrate the way in which my philosophical stance and orientation towards the stance guided this project's design, shown in Figure 2.1.

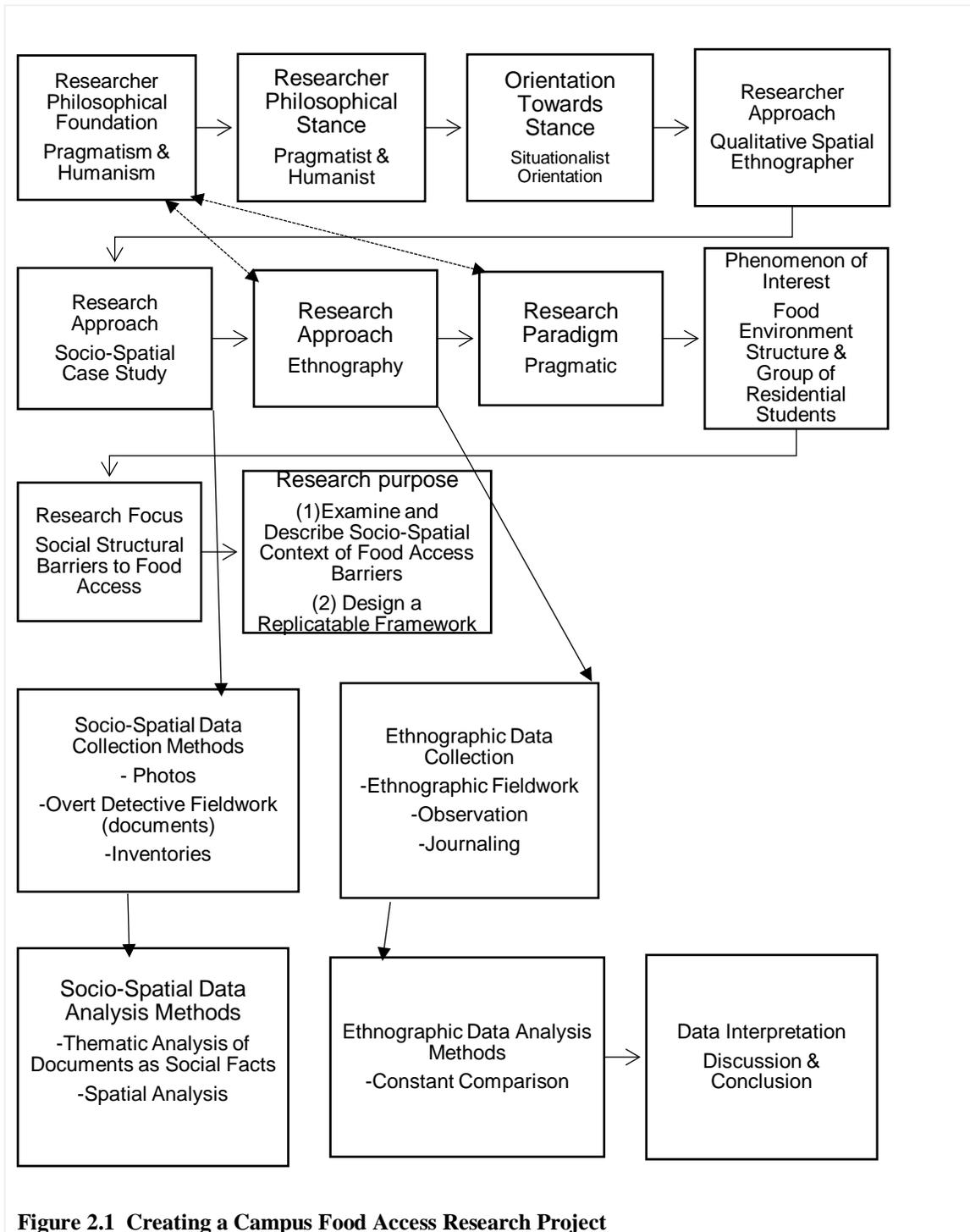


Figure 2.1 Creating a Campus Food Access Research Project

CHAPTER III

METHODOLOGY

This chapter describes the methodology, methods, and setting used in this sociological case study. I used mixed methods to examine and describe potential access to food at a university located in a neighborhood classified as a food desert by the USDA Food Research Atlas. Two objectives guided my research. The first was to create a framework researchers could use to identify and measure structural barriers to food access within university food environments. The second was to pilot-test the tool by conducting a case study on the Denton campus of Texas Woman's University.

For the past few years, I have been both a graduate student who takes classes at Texas Woman's University and an employee of the university. I serve as the undergraduate advisor for criminal justice. During that time, I have interacted with hungry graduate and undergraduate students. When I use the word "hungry" I do not mean that they were competitive, but rather they were physically hungry. More often than not, their hunger was attributed to lack of money to buy food and a lack of time to get to the grocery store to shop since the cheaper stores (i.e., Walmart and Kroger) are not in walking distance from the school. This pattern of dialog continued each semester even as new students came in. There seemed to be a consensus among students that they lacked access to food for one reason or another. I took a qualitative research methods class at Texas Woman's University in the fall semester of 2014. One of the course requirements

was to form a research team with classmates (most had three members). Then we were to conduct literature reviews and interviews. My research team was made up of two graduate students from the University of North Texas and myself. The focus of our qualitative research was graduate students' perspectives about hunger and food insecurity. Several points from this class project resonated with me and began to form my conceptualization for this thesis. First, hunger, food insecurity, and food access challenges existed not only at Texas Woman's University, but also at the University of North Texas and other colleges and universities across the United States. Second, a common theme expressed by participants of our class project was the lack of access to food on campus. Finally, if I wanted to truly capture a snapshot of what food access is like on campus, I needed incorporate multiple research methods to investigate the issue. As using secondary data and food access atlas data was inappropriate for these purposes, I needed to collect primary data. I wanted to actually walk the streets, identify food outlets that were in business, and then to measure the distances because of the campus structures that prohibit potential walking paths. Using Google Maps to simply measure street distance to street distance could not accurately represent the walking distance. Further, secondary data could not provide environmental observations, such as locations of crosswalks and shade that are important to students who are walking from campus housing to buy food.

My original thesis proposal included both surveying students to identify whether food insecurity exists on the Denton campus and to spatially map food access for the campus. My committee and I narrowed the focus so I could reasonably complete a thesis

in order to graduate. This is an important area of research. However, I intended to continue to build a research agenda in this area in my doctoral studies. In Figure 3.1 I show a conceptual framework for studying food access on a university campus.

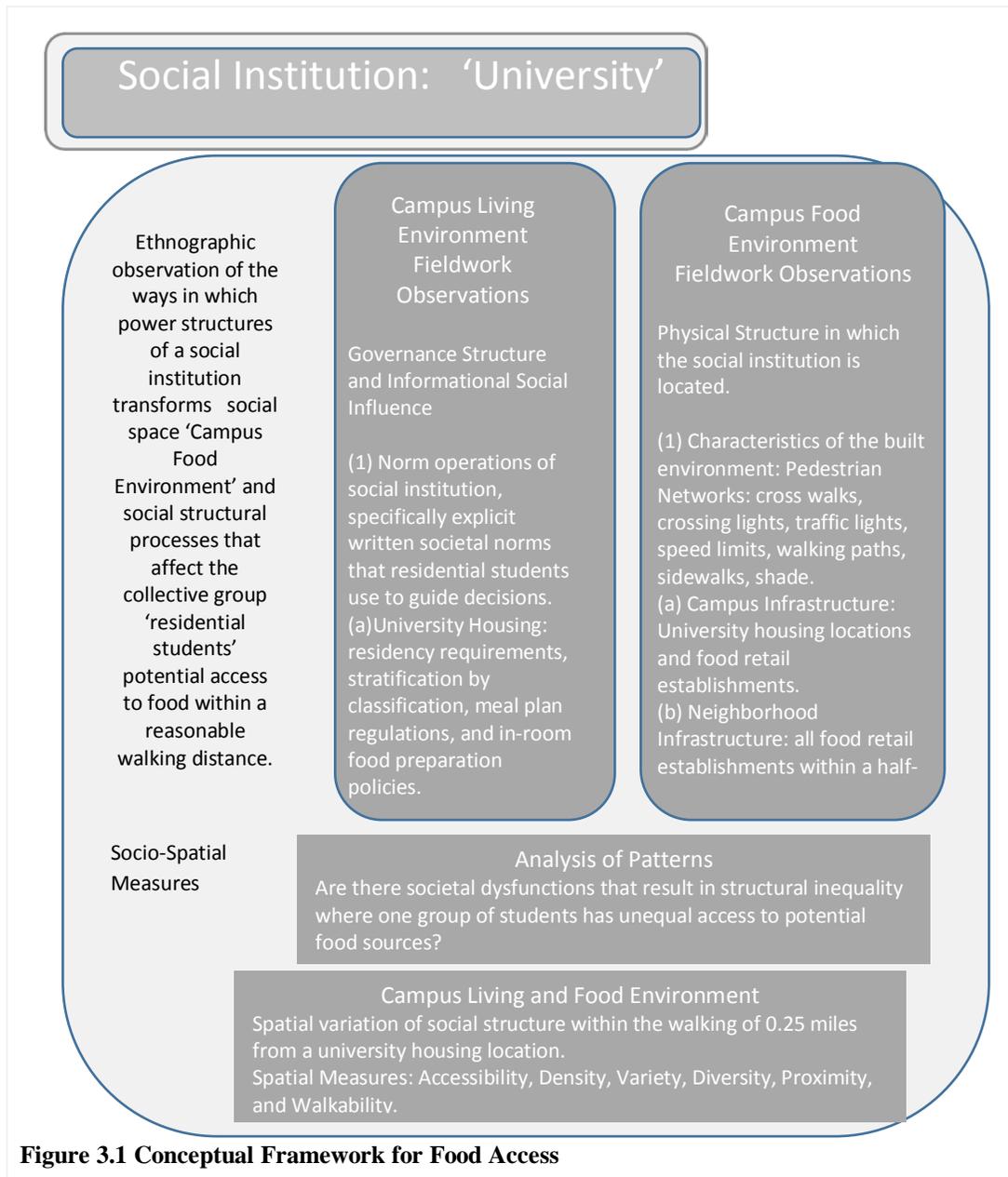


Figure 3.1 Conceptual Framework for Food Access

SETTINGS AND METHODS

This section describes the process of how and why I chose each research method as well as the principles that guided my research practices. According to Savin-Baden and Major (2013), qualitative researchers have an overwhelming number of choices to make when designing research studies. As a pragmatist with a situationalist orientation towards research, I used the philosophical paradigms and assumptions from the tradition of pragmatism to view food access. Through this lens, the ontological and epistemological assumptions are that “reality is that which is practical...and knowledge is derived from observation of interaction among a group of individuals and artefacts in their environment” (Savin-Baden and Major 2013:64). Therefore, in an effort to conduct quality research that adds to the discipline of sociology, I factored in the underlying principles of pragmatism and discipline of sociology while evaluating compatible research approaches.

After considering several approaches, I decided to use a sociological case study approach for this thesis. This type of case study draws from sociological theories to focus on the ways in which society and influences the phenomena in question (Savin-Baden and Major 2013). A sociological approach, for example, may examine the ways in which a social structure such as a university impedes or facilitates access to food on campus. Whereas a psychological approach might examine how a food insecure individual modified his or her behavior to adapt to lack of access to food. In the field of sociology, various definitions of “case study” exist. In this thesis, the term *case study* refers to a combined unique research approach and end-product narrative report (Savin-Baden and

Major 2013). For this study, I utilize the methods of both ethnography and geospatial analysis. The end-product, also known as case narrative, is the written report that describes the field observations and artifact analysis (Savin-Baden and Major 2013).

This case study approach could be replicated on other university campuses; this way, the method for measurement could potentially benefit more students. I envisioned the method of measuring potential food access to include inventory tools for on-campus and off-campus data collection, along with identifying constructs based on a review of literature and mixed methods, including spatial measures. Since most of the literature that I reviewed mentioned a tool for measurement but did not include the actual tool, in an effort to maximize benefit to the discipline of sociology, this thesis includes both. I found a website through a Google search (appliedresearch.cancer.gov/instruments) that listed several researchers' survey instruments. I reviewed the following instruments for this project: USDA Thrifty Food Plan Store Survey Instrument, San Diego Grocery Stores Data Collection Tool Final (Ayala), HEZ Grocery Store Checklist (Braunschweig-hez), and Nutrition Environment Measures Survey-NEMS (Glanz et al. 2007) to construct my own tool.

Place-Based Constructs

In my opinion, French (2014) conducted one of the most valuable food access studies on college campus to date. My decision to incorporate spatial analysis was based on the methodologically sound data collection methods from French's (2014) food desert thesis. These place-based factors were chosen based on literature with the objective of measuring the accessibility of food that is available to students within the geographic

location of campus (Horner and Wood 2014). I used distance-based measures to determine the distribution of food establishments (i.e., proximity and density).

Walking and Fixed Spatial Distance

True walking distance is often displayed on GIS maps with concentric circles. However, when drawing concentric circles, researchers are actually marking the “air distance” around a particular variable. Humantransit.org (2011) suggested that when researchers draw concentric circles to imply walking distance around a variable, unless it is drawn over a perfect pedestrian grid the air distance circle is not representative. Historically, if a researcher wanted to illustrate the walking distance of a quarter-mile, he or she would draw a 400m circle. However, a better approximation within a perfect pedestrian grid would be drawn with a 319m circle (Humantransit.org 2011). When the neighborhood a researcher is analyzing is an obstructed network, (such as Texas Woman’s University) the most accurate representation of walking distances should be drawn an ellipsis around the variable (Humantransit.org 2011). Smith et al. (2010) argue that it is essential for researchers to use road-based network distances versus straight-line distance (as the crow flies) for the most accurate and realistic results.

This thesis uses neither method for illustrating walking distance. I made this decision for several reasons. First, neither the university nor the neighborhood surrounding the university was not drawn on a perfect roadway grid system. Second, the university campus was designed with a complex system of pathways to enable students to walk between buildings on campus in the most direct manner. For this reason, I decided

to examine the actual shortest walking distance from the university housing to food resources using existing roads or pathways.

Reasonable Walking Distance. According to the *City of Denton's Mobility Plan*, "Pedestrian access should be provided to all destinations that are within walking distance (about one-quarter mile) of where people live and/or work" (Freese and Nichols 2012:21). Numerous researchers who study food access and pedestrian infrastructures use one-quarter mile walking distance as the distance humans are willing to walk (Hsu and Tsai 2014; O'Toole 2010; Wolch, Wilson and Fehrenbach 2002; Regional Plan Association 1997; Human Transit.org 2011; Ewing 1999). The standard measure of one-quarter mile is the most frequently cited walking distance (Humantransit.org 2011). The Regional Plan Association (1997) indicated that most people are willing to walk only a quarter-mile- a comfortable walking distance- approximately 5 to 10-minute walk. Ewing (1999) agreed that the expected walking distance should be calculated at a quarter-mile or less. The Mid-American Regional Council (*N.d.*) used a similar distance of 1,500 feet (0.28 miles) when measuring the distance that people are willing to walk to shop. However, some researchers, such as O'Toole (2010), reported that Americans are willing to walk only 600 feet (0.11 miles). These studies were based on an assumption of a comfortable walking distance for able-bodied people, thus there is a variation for people with physical limitations.

STUDY DESIGN

Research Question and Potential Sub-Questions

The main research question that signals what I want to examine and describe is, do the students who reside in campus housing have convenient walking access to adequate quantities of affordable, healthy, and culturally appropriate foods. In this project, “access” is defined as the ability of the residential students to have potential access to food retail outlets to purchase affordable and healthy food from sources on and near campus and within the walking distance of one-quarter mile.

The sub-questions include: (1) what potential sources of food exist within a reasonable quarter-mile walking proximity to campus housing, (2) in addition to what is spatially close, what is inside of the campus food environment (i.e., variety and diversity)?

Phenomenon and Participant Selection

Case studies guided by sociological perspectives, commonly select social structures as the phenomenon of interest (Savin-Baden and Major 2013). Similarly, this focus on structure is congruent with a pragmatic paradigm (Savin-Baden and Major 2013). I call attention to this fact because this project uses both sociological and pragmatic perspectives as the guiding philosophical foundations. Data collected at a micro versus over-aggregated macro sociological focus will generate a more accurate description of the local food environment. This view is supported in the literature by others (Ratcliff and Tiamzon 2012) who suggested that a sociological lens of food access is best viewed locally because it requires a focus on the individuals.

I agree with Ratcliff and Tiamzon, and argue that researchers need to connect at the micro-group level to gain understanding of structural barriers to potential food access.

Data

Fieldwork consisted of data collection of the two main place-based measures of access, the Campus Living Environment and the Campus Food Environment. These constructs were examined with distance-based measures (See Appendices A, B, C, D and E).

Field Site Selection

Texas Woman's University-Denton campus is located in an area that the USDA's (2015) Economic Research Service identified as food desert and area with low vehicle access. The official designation of food desert refers to a location classified as a "low-income census tract, where a significant number or share of residents is more than ½ mile from the nearest supermarket" (USDA 2015). The Texas Woman's University Office of Institutional Research and Data Management's Fact Book (2015) reported that, in 2014, the total enrollment for Texas Woman's University-Denton campus was 12,332 students, 95.3 percent (11,758 students) resided in Texas. This data, in conjunction with Feeding America's Map the Meal Gap 2015 data detailing the rate of food insecurity, and the percentage of the population likely income eligible for Federal Nutrition Assistance for all Texas counties, could potentially indicate a high number of students who were food insecure prior to enrolling at Texas Woman's University, signaling a potential lack of financial resources and family support to purchase food while attending Texas Woman's University (Feeding America 2015).

SOCIOLOGICAL CASE STUDY DATA COLLECTION

I used a mixed-methods approach that included ethnographic and socio-spatial methods to collect data for the campus living environment and the campus food environment. The ethnographic data collection consisted of fieldwork (i.e., reviewing websites, reviewing student handbooks) and observation (i.e., visiting each location, recording distances, using the *Campus Food Environment Measure*, and *Infrastructure: Pedestrian Network Observational Tool* checklist).

ONLINE DATA COLLECTION

In Table 3.1 I provide a list of the types of websites and an overview of the types of public documents that I found during the data collection phase of this project. My intent for sharing this information is not to limit a future researcher's approach to data collection but rather to provide an overview of the public documents I found. Thus, this table is intended to serve as a starting-point for researchers to design his or her detective fieldwork. The table shows the types of websites with an overview of the institutional departments, and the types of public documents or potential key words.

Table 3.1 Locating Public Documents Online

Types of Websites	Overview
University Website	<p>Marketing and Communication News releases, Texas Woman’s University history and update Website: http://www.twu.edu/twunews/press_releases/</p> <p>Virtual Campus Tour University buildings, residential hall and apartments Website: http://www.twu.edu/tour/</p> <p>Office of the Chancellor Strategic planning, communications from Chancellor Website: http://twu.edu/chancellor/default.asp</p> <p>Board of Regents Approved minutes, meetings, committee audits, and agenda Website: http://www.twu.edu/regents/</p> <p>Department of Public Safety Campus maps, Cleary act reports, sex offender reports, Denton crime reports Website: http://www.twu.edu/dps/</p> <p>Department of University Housing Housing service agreements, contracts, and rates, campus living handbooks, addendums, living option descriptions and floor plans, campus tours, move in documents, Website: http://www.twu.edu/housing/default.asp</p> <p>Office of Institutional Research & Data Management Institutional reports, data, and statistics Website: http://www.twu.edu/institutional-research/default.asp</p> <p>Office of Emergency Management Look for maps of buildings on campus to locate student lounges with vending areas Website: http://www.twu.edu/emergency/</p> <p>Office of Institutional Improvement Visioning and strategic planning initiatives, committee Reports, visioning forums, Website: http://www.twu.edu/visioning/</p>

	<p>SACS Accreditation-Southern Association of Colleges and Schools-Commission on Colleges (SACS) Reports, QEP Website: http://www.twu.edu/sacs/</p>
City of Denton	<p>City of Denton Planning Department GIS data downloads, interactive and downloadable maps, zoning information, neighborhood planning Website: http://www.cityofdenton.com/departments-services/departments-g-p/planning/gis-planning</p> <p>City of Denton Consumer Health Department Food inspection information, restaurant scores, codes and ordinances Website: http://www.cityofdenton.com/departments-services/departments-a-f/consumer-health/restaurant-scores</p> <p>City of Denton Active Transportation Department Pedestrian safety, projects and maps, municipal codes Website: http://www.cityofdenton.com/departments-services/active-transportation/pedestrian-safety</p>
Local News Papers	<p>Denton Record-Chronicle Website: http://www.dentonrc.com/</p> <p>The Lasso Student Newspaper Website: http://www.twulasso.com/</p> <p>North Texas Daily Website: http://ntdaily.com/</p>
U.S. Census Bureau	<p>State, county, and city statistics Website: http://quickfacts.census.gov/qfd/states/48/48121.html</p>
Google Search	<p>Search for news articles using the following key words, Campus Food Insecurity, University Food Insecurity, University Food Bank, Student Food Insecurity</p>

I collected and read official and unofficial Texas Woman’s University documents to identify ways that the university’s institutional policies and actions affect food access within the campus food environment. These documents were collected from the university’s website (see Table 3.1). I collected the following electronic documents:

- *Texas Woman's University 2013-2018: From Visioning to Integrated Planning*
Visioning Committee I Final Report and Appendix G Housing (Texas Woman's University 2012d)
- 2014 Fact Book: Denton Campus, Spring 2015 data (Texas Woman's University 2014, 2015)
- John Alonzo Guinn (Texas Woman's University N.d.)
- University Housing Guinn Hall Project, summer 2014 (Texas Woman's University 2014)
- News Releases: Student Input Driving Force behind Texas Woman's University New Residence Hall Opening in August (Texas Woman's University 2005)
- Compliance Certification Report (Texas Woman's University 2012)
- Action Item No. 16 Finance and Audit Committee (Board of Regents 2015)
- Campus Parking Map (Texas Woman's University 2015g)
- University Housing Guinn Hall Project (Texas Woman's University 2014)
- Housing Services Agreement (Texas Woman's University 2011)
- University Housing Handbooks: The Lowry Woods Community Handbook Addendum (Texas Woman's University 2015h)
- Lowry Woods Community (Texas Woman's University 2015i)
- Grove Street Apartments (Texas Woman's University *N.d.c*)
- Move In 2014 (Texas Woman's University 2014)
- Campus Living Handbook (Texas Woman's University 2014)

- Jones Hall (Department of University Housing 2015b)
- University Housing Rates Fall 2015-Spring 2016 (Texas Woman's University 2015c)
- Residence Halls and Apartment Communities with Floor Plans (Department of University Housing 2015e)
- Building Maps (Texas Woman's University 2015j)
- Visioning Committee 1 Final Report: Appendix G Housing (Berthiaume 2012)
- Food Restaurant Scores (City of Denton 2015)
- Update to the Pedestrian and Bicycle Linkage Component of the Denton Mobility Plan (Freese and Nichols 2012)

I selected the documents to analyze the ways in which the power structure of the social institution transforms the social space of the campus and social structural processes that affect the collective group 'residential students' access to food within a reasonable walking distance.

ETHNOGRAPHIC DATA COLLECTION METHODS

Ethnography

Ethnography is a methodological approach that studies and describes people (Howell 2013). Ethnographic research is the best approach for this project because it tends to be undertaken in the field with the goal of providing thick description and involves

investigation of social phenomenon through inductive processes rather than deductive processes and hypotheses testing; a tendency to deal with data that is

coded at the point of collection into categories, themes or typologies; investigation of small numbers of cases or one case in a very detailed fashion; and data analysis based on interpretations of meanings and action which involves the elevation of qualitative explanation over quantitative techniques (Howell 2013:118).

The fieldwork for this study included participant observation and description in the context of the campus food environment. I conducted walk-throughs while taking field notes, and I took photographs and videos to gather data on all on campus residences, food availability, and walking distance to each food establishment within one quarter-mile from university residences.

Infrastructure observations were guided by Sun, Oreskovic, and Lin's (2014) method for collecting walking data on a university campus. Sun et al. (2014) note the importance of pedestrian networks when examining a university campus and caution against using an analysis of only street networks (traditionally measured with GIS). Observation of pedestrian networks in addition to street networks provides a more complete description in campus environments (Sun et al. 2014). Further, Maghelal and Capp (2011) described commonly used physical constructs that they identified in their comprehensive review of literature: physical characteristics of streets and sidewalks, speed limits, space between vehicles and walkers, signals at cross walks, the number of intersections, the number of lanes in road, curb cuts, building distances from sidewalk grass buffer, street lights, trees for shade, weather/climate, sidewalk/walkway slope, traffic volume, a sense of security, attractiveness of architecture and landscaping, odor, and noise. Thus, my field notes

incorporated many of the observational constructs that were grounded in research. I used the *Campus Food Environment Measure-Pedestrian Network Observation Tool (CFEM-PNOT)* (See Appendix E).

SPATIAL DATA COLLECTION METHODS

Measurement Instruments: Campus Food Environment Measures

The study's methodology and instruments can be replicated at the institutional level to write policies that can minimize student suffering through improvement of food access. Most colleges and universities have campus-wide strategic plans that center on the academic success of their students; however, if students lack access to food they may lack energy and concentration, and may receive lower grades (Maroto 2013). Thus, by exploring the campus food environment, administrators can identify potential facilitators and barriers to food access for students (Maroto 2013).

I created the *Campus Food Environment Measures* to identify the potential access to food on and near campus. I created this series of instruments because the existing survey tools I reviewed did not collect data that would fully describe the unique food environment of a university. These instruments were used to collect data on all food establishments on campus as well as within one-quarter mile of campus. I collected data on the following measures of interest: food availability, food affordability, and food access within the geographic boundary of the Texas Woman's University-Denton campus.

INVENTORY TOOLS

Campus Food Environment Measure-Store Inventory

The *Campus Food Environment Measure-Store Inventory (CFEM-SI)* tool (see Appendix D) for surveying stores on and near campus (within one-quarter mile) which include location, pedestrian roadways (i.e., streets, speed limit, intersection crossings), hours of operation, type of store (i.e., supermarket, convenience, pharmacy, grocery/specialty), payment methods, availability of products, and observation experience (i.e., odor, cleanliness, data collection accuracy).

Campus Food Environment Measure-Restaurant Inventory

The *Campus Food Environment Measure-Restaurant Inventory (CFEM-RI)* tool (see Appendix C) for surveying restaurants on and near campus (within one-quarter mile) which include location, pedestrian roadways (i.e., streets, speed limit, intersection crossings), hours of operation, type of restaurant (i.e., full-service, limited service, cafeteria, snack/beverage bar, other), restaurant cuisine (i.e., American, burgers, chicken, deli/ sub sandwiches, pizza, sushi, coffee/tea, Mexican, Italian, other), payment methods, and observation experience (i.e., odor, cleanliness, data collection accuracy).

Campus Food Environment Measure-Vending Inventory

The *Campus Food Environment Measure-Vending Inventory (CFEM-VI)* tool (see Appendix B) for surveying vending areas on campus which include description of vending location, building hours of operation, type of vending machine, payment methods, healthy nutrition promotion, vending machine inventory (i.e., foods/beverages for sale), and observation experience (i.e., odor, cleanliness, data collection accuracy).

Campus Food Environment Measure-Pedestrian Observation Tool

The *Campus Food Environment Measure-Pedestrian Observation Tool (CFEM-POT)* tool (see Appendix E) for surveying pedestrian networks on campus on and near campus (within one-quarter mile) which include physical characteristics of streets and sidewalks (i.e., grass buffer, cross walk signals, intersections, lanes in road, curb cuts, street lights, shade trees, weather/climate, sidewalk/walkway slope, traffic volume, sense of security, attractiveness of architecture and landscaping, odor, noise, speed limits).

I accessed the City of Denton Consumer Health Department website at <http://www.cityofdenton.com/departments-services/departments-a-f/consumer-health> and then accessed the restaurant scores from their April 2015 report for a current list of food service establishments in Denton. From that list, I selected establishments that were located within one-quarter mile of the campus. From this list, I typed each establishment's address along with each Texas Woman's University campus residence addresses into Google Maps and selected the option for walking. Each food establishment that was within one-quarter mile of campus housing was added to the campus food environment map and list of establishments to survey.

SPATIAL DATA ANALYSIS CAMPUS FOOD ENVIRONMENT MEASURE

Spatial Food Proximity and Density

When calculating spatial accessibility researchers commonly use the measures of “proximity and density”. Burgoine, Alvanides, and Lake (2013) defined food outlet proximity as the distance to the food resource. I define the measure, *proximity*, as the distance from each food establishment to a university sponsored student residence. I

calculated proximity using a minimum distance method. This is accomplished by assessing the shortest path (i.e. Manhattan distance using city block or street) (McKinnon et al. 2009).

My rationale for including density, variety, and diversity analysis is because when looking at access it is not only important to look at the proximity, what is spatially close, but rather what is inside of the geographic area of interest. I define “density”, as the number of *all* food establishments that are available to students on campus. I used the longitude and latitude coordinates for each housing location in conjunction with the road-based pedestrian network to identify all food retail establishments within one-quarter mile from each university housing location. The total number of establishments equals the spatial food density for students who live in university residences.

Spatial Food Variety

I define “variety”, as the type of all food establishments on campus. Including the categories of foods available at each food establishment and culturally appropriate options. Meaning, variety is the assessment of the overall availability of different types of food establishments (McKinnon et al. 2009). I identify the mean proportions of types of food establishments in the density calculation. Types are classified into the following categories: Cafeterias, Convenience Stores, Drug Stores, Full-Service Restaurants, Grocery Stores, Limited-Service Restaurants, and Vending Machines (see Appendix A for definitions of food establishments).

Spatial Food Diversity

“Spatial food diversity” is defined as the density of all food retail establishments and number of different cuisine classifications of each establishment. Cuisine classifications include: American, burgers, chicken, deli/sub sandwiches, pizza, sushi, coffee/tea, Guatemalan, Mexican, Italian, and Greek. Not that these are all the available options for students within the study area.

ETHNOGRAPHIC DATA ANALYSIS

I use an emic perspective to analyze the ethnographic data from my observations. I use a classification scheme drawn from categories such as experiences in everyday life, the environment, economy and demographics (Savin-Baden and Major 2013). When analyzing documents, I use emergent codes that arise from constant comparison (Savin-Baden and Major 2013).

LIMITATIONS

I acknowledge that data from this measure is representative of food resource “exposure”, meaning proximity to food within the campus food environment does not assume use of food resources. Burgoine et al. (2013:7) noted factors such as “transportation preference, motivation to walk, economic factors, and neighborhood perceptions” that contribute to access that are not evaluated within a geographic perspective. Further, this is an aggregate assessment that describes data about the food campus food environment area and possible access students have to food purchasing opportunities, may not reflect actual access of food by students (Horner and Wood 2014).

CHAPTER IV

CASE STUDY AT TEXAS WOMAN'S UNIVERSITY-DENTON CAMPUS

This chapter describes the details of the case study and provides an inventory of the campus food environment and university housing options available to students who are required to live on campus.

DENTON, TEXAS HISTORY

In 1846, the Texas Legislature voted positively to form Denton County. The City of Denton was incorporated 20 later, in 1866, and served as the county seat (Odom 2010a). The city was named after John B. Denton, a Texas militia captain and a lawyer (Bates 1918). In 1890, North Texas Normal College was established, followed 13 years later, in 1903, by the establishment of the Girls' Industrial College (Odom 2010b). The city of Denton is home to the University of North Texas and Texas Woman's University (Odom 2010b). The presence of the two universities, with their combined enrollment of over 48,000 students (Texas Woman's University 2014, University of North Texas 2013), influences the city's culture, economy, and demographics (Odom 2010b; Clower and Hendershot 2011). In 1866, Denton county was comprised of 100 acres of land and had 361 residents (Clower & Hendershot 2011), whereas today, the land area of Denton County is approximately 88 square miles and its estimate population is 753,363 (U.S. Census 2015). The City of Denton has a population of 123,099 (U.S. Census 015), and the 13th fastest growing city in the nation (United Way of Denton County 2011).

FOOD INSECURITY IN NORTH TEXAS

The North Texas Food Bank (NTFB) is a non-profit organization that specializes in programs to alleviate hunger in this region (North Texas Food Bank 2015). NTFB's service area includes Grayson, Fannin, Lamar, Delta, Denton, Collin, Hunt, Hopkins, Rockwall, Dallas, Kaufman, Ellis, and Navarro counties. Recent data reported by Feeding America (2014) found that within this food bank's service area, 14,500 (5.2 percent) of adult clients self-identified as full-time students and 8,300 more (3 percent) identified as part-time students. When asked about trade-offs between food and other expenses, within the past 12 months, 31 percent of NTFB client households reported choosing between paying for food and paying for school loans, tuition, or other educational expenses (Feeding America 2014).

Approximately 29,500 Denton county residents annually access a NTFB food pantry (Feeding America 2015b). When asked health status questions, 57 percent reported household members in poor health; 34.9 percent with diabetes, 84.1 percent high blood pressure, and 34 percent reported that no household member has health insurance (Feeding America 2015b). In Denton County, 1,163 adult clients reported making spending trade-offs between buying food and paying for educational expenses in the past 12 months (Feeding America 2015b).

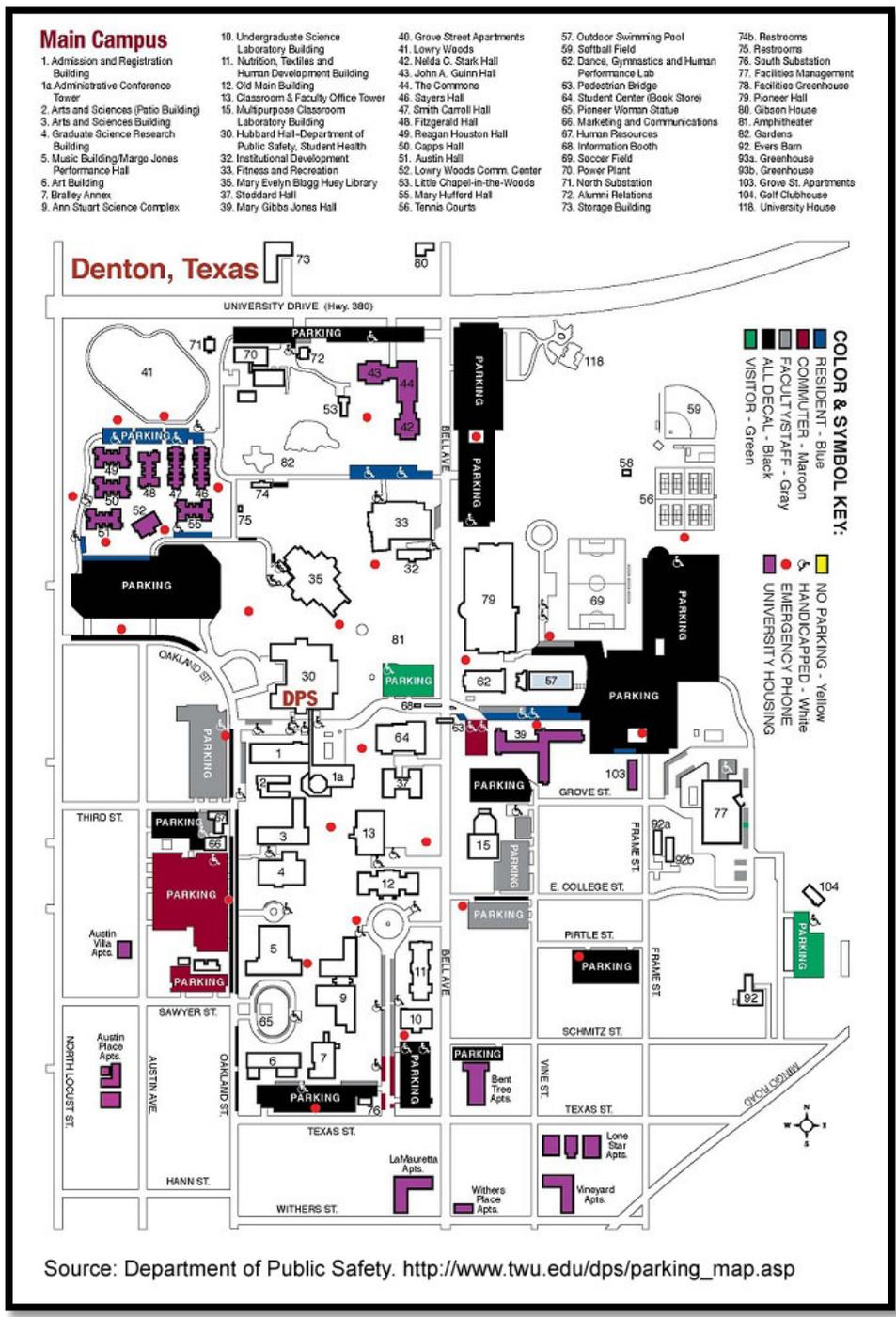


Figure 4.1 Texas Woman's University Campus Map

TEXAS WOMAN'S UNIVERSITY

“Scientia Lumen Vitae-Knowledge is the Light of Life” is the motto printed on the Texas Woman’s University seal (Texas Woman’s University 2015k). Texas Woman’s University was established in 1901 as The Girls Industrial College (Texas Woman’s University 2015b). Only a few years after, in 1905, the name changed to The College of Industrial Arts (Texas Woman’s University 2015b). As more time passed, the demand for graduate-educated women grew. In 1930, graduate study programs were established, and in 1953 the first doctoral degrees were awarded. During this time, the college underwent two more name changes, first to the Texas State College for Women and then to Texas Woman’s University (Texas Woman’s University 2015b). In 1972, the historically single-sex university began to accept both women and men (who qualified) into the Graduate School and the Institute of Health Sciences, and in 1994 acceptance was expanded to include all programs at Texas Woman’s University (Texas Woman’s University 2015b).

Texas Woman’s University has three campuses. One campus is located in Dallas Texas, another is located in Houston Texas, and the main campus is located in Denton Texas (Texas Woman’s University 2015b). The Denton campus is situated on approximately 259.23 acres of land, and includes 58 buildings (Texas Woman’s University 2013:347). I provide Figure 4.1 to show a map of Texas Woman’s University-Denton campus. In Table 4.1, I provide a breakdown of the fall 2014, undergraduate enrollment by full-time and part-time status and gender. In Table 4.2, I present fall 2014 enrollment data by classification. In Table 4.3, I highlight fall 2014 undergraduate

enrollment by student ethnicity. Tables 4.4 and 4.5 summarize Denton campus enrollment by state and county, fall 2014.

Table 4.1 Texas Woman’s University-Denton Campus Undergraduate enrollment

Part-time		2,756
	Female	2,397
	Male	359
	Total	8,813
Full-Time		5,433
	Female	4,846
	Male	624
	Total	8,813

Source: Texas Woman’s University, Office of Institutional Research & Data Management, Fact Book 2015

Table 4.2 Texas Woman’s University-Denton Campus Enrollment by Classification

FTIC	2,059
Sophomore	1,546
Junior	2,079
Senior	2,821
Post-baccalaureate	308
Masters	2,917
Doctoral	602
Total	12,332

Source: Texas Woman’s University, Office of Institutional Research & Data Management, Fact Book 2015

Table 4.3 Texas Woman’s University-Denton Campus Enrollment by Ethnicity

White	3,480	40.9%
African-American	1,922	22.6%
Hispanic	2,153	25.3%
Asian/Pacific Islander	716	8.4%
Amer Ind/Alaskan Native	118	1.4%
International	71	0.8%
Other	45	0.5%
Total	8,813	100%

Source: Texas Woman’s University, Office of Institutional Research & Data Management, Fact Book 2015

Table 4.4 Texas Woman’s University-Denton Campus Enrollment by Residence

Texas	11,758
Out-of-state	373
International	201
Total	12,332

Source: Texas Woman’s University, Office of Institutional Research & Data Management, Fact Book 2015.

Table 4.5 Texas Woman’s University-Denton Campus Enrollment Top Counties

Dallas	3,480
Denton	1,922
Tarrant	2,153
Collin	716
Harris	118

Source: Texas Woman’s University, Office of Institutional Research & Data Management, Fact Book 2015

Table 4.6 lists and compares the names of buildings located on the Texas Woman’s University-Denton campus and the abbreviations commonly used by administrators and students. More often than not, campus building abbreviations are used on campus maps, on flyers, and on campus related websites rather than the buildings official name. When conducting campus based research it is important to use the same terminology used by staff and students to not only maintain consistency but also to facilitate accessibility when reporting findings of the information by using terminology that is familiar.

Table 4.6 Denton Campus Buildings and Abbreviations

Official Building Name	Also Known As	Abbreviation
Administration Conference Tower	Clock Tower	ACT
Admissions and Registration Building		ADM
Fine Arts Building	Art Building	ART
Arts and Sciences Building		ASB
Ann Stuart Science Complex		ASSC
Classroom and Faculty Office Building		CFO
The Commons		
Dance, Gymnastics, and Human Performance Laboratories		DGL
Fitness and Recreating Building		
Graduate Science Research Building		GRB
Greenhouse		
Grove Street Apartments	Grove Street	
Hubbard Hall		HH
Nutrition, Textiles, and Human Development Building.		HDB
John A. Guinn Hall	Guinn Hall	
Little Chapel-in-the-Woods	Little Chapel	LC
Lowry Woods Community	Lowry Woods	
Mary Eleanor Brackenridge Student Union	Student Union or Student Center	SU
Mary Evelyn Blagg Huey Library	Blagg-Huey Library	BHL
Mary Gibbs Jones Residence Hall	Jones Hall	JH
Multipurpose Classroom Laboratory Building		MCL
Music Building		MUS
Nelda C. Stark Residence Hall	Stark Hall	
Old Main Building	Old Main	OMB
Patio Building		PB
Pioneer Hall		PH
Redbud Theater Complex		RDB
Stoddard Hall		SH
Undergraduate Science Laboratory Building		ULB

Source: Texas Woman's University 2015e

TEXAS WOMAN’S UNIVERSITY CAMPUS HOUSING

The Department of University Housing is a large department that employs over 120 staff members, operates 7 days a week 24 hours a day, and manages housing for approximately 2000 students (Berthiaume 2012). The department has 21 buildings to house students (Berthiaume 2012). Approximately half of the buildings are university-owned and located on the Denton campus; the other half (called TWU Select Apartments) are located close to campus and are under a long-term agreement for “management services” with Scott Brown Properties (Texas Woman’s University 2011).

Texas Woman’s University offers a variety of campus living options that range from traditional dormitory-style living, such as Guinn, Stark, (see Photo 2) and Jones Halls (see Photo 7), to apartment-style communities such as Lowry Woods, Grove Street Apartments, and the TWU Select properties. Dr. Berthiaume, Director of University Housing, noted the following trends as part of the 2012 Visioning Committee I Final Report: “TWU students have indicated they want to live on campus all four years, many residential students do not have vehicles, and there is an increased need for students to be employed” (Berthiaume 2012:81).



Figure 4.2 Guinn Hall and Stark Hall

ON-CAMPUS HOUSING

Nelda C. Stark Residence Hall

Nelda C. Stark Residence Hall (Stark Hall), shown in Figure 4.2, is a 21-story residential building that is located on the Texas Woman's University-Denton campus (Texas Woman's University 2013). The building was designed to accommodate 640 residents with double and triple occupancy sized rooms (Texas Woman's University 2013). While the building was constructed with private bathroom for each room, it was not designed with a dining hall (Texas Woman's University 2013). Students who reside in Stark Hall are required to purchase a meal plan (Texas Woman's University 2015c).

The construction of the sky-scraper, began in 1965 and was completed in 1967 for \$3.2 million dollars (Texas Woman's University *N.d.*). The building was the first skyscraper to be built in the city of Denton (Texas Woman's University 2013). The residence hall was named in honor of Nelda Childers Stark, a Texas Woman's University alumna and benefactor (Texas Woman's University *N.d.*).

John A. Guinn Residence Hall

John A. Guinn Residence Hall (Guinn Hall) is a 24-story residence building that is located on Texas Woman's University-Denton campus on East University Drive (Texas Woman's University 2013). When Guinn Hall was completed in 1969, it was the tallest residence hall in the United States (Texas Woman's University 2013). The residence hall was named in honor of Dr. John Alonzo Guinn, the sixth President of the Texas State College for Women (Texas Woman's University *N.d.*). Today, it is "the tallest building between Dallas and Oklahoma City" (Texas Woman's University 2013). The residence hall was not built with a dining hall. Students who reside in Guinn Hall are required to purchase a meal plan (Texas Woman's University 2015c).

According to documents reviewed, during the summer of 2014, Guinn Hall underwent a major interior renovation (Texas Woman's University 2014). The renovations included replacing flooring in the elevator/atrium area and the hallway, electrical upgrades, and light fixtures on the 12th floor lounge (Texas Woman's University 2014). The student room renovations included painting the walls, and installing new desks, bookshelves, beds, dressers, and micro-fridges (Texas Woman's University 2014). Both Guinn Hall and Stark Hall, are adjacent to a building called the

Commons (Texas Woman's University 2013). The Commons houses a computer lab, the C-Store, and spaces for social activities (Texas Woman's University 2013).

Mary Gibbs Jones Hall



Figure 4.3 Jones Hall

Mary Gibbs Jones Hall (Jones Hall) is located on Texas Woman's University-Denton campus, on Administration Drive, across the street from the Dance-Gymnastics Laboratory Building. In Figure 4.3, I show a photograph of a partial view of the exterior of Jones Hall. Each room is designed for double occupancy (with a community bathroom) and is furnished with beds, desks, dressers, and micro-fridge (Texas Woman's University 2015b). In addition to serving as a residential hall, the three-story building also serves as office space for multiple Texas Woman's University departments. For example, on the second floor of Jones Hall, there is a service area where all students, faculty, and staff go to have photo identification cards issued (Texas Woman's University

2013). The building does not have a cafeteria or restaurant. However, there is a vending area located on the first floor that can only be accessed by Jones Hall residents and staff. Figures 4.4 and 4.5 are photographs that show the private vending area where residents can purchase soda and snack foods. Students who reside in Jones Hall are required to purchase a meal plan (Texas Woman's University 2015c).



Figure 4.4 Vending Area in Jones Hall

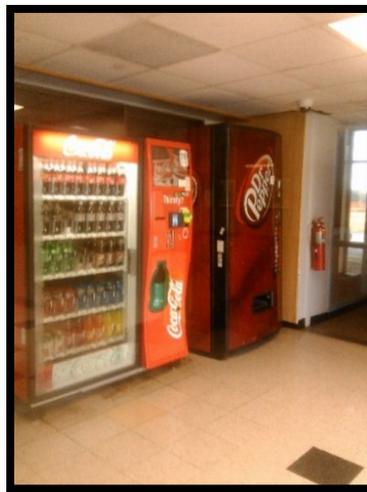


Figure 4.5 Vending Machines in Jones Hall

Lowry Woods Community



Figure 4.6 Lowry Woods Community

The Lowry Woods Community is an apartment-style residence hall located on Texas Woman's University-Denton campus, on Oakland Avenue (Texas Woman's University 2005). In Figure 4.6, I show a photograph of the exterior of the Lowry Woods Community. The community was designed by Rees Associates, Inc. of Dallas and built by Carlton Construction (Texas Woman's University 2005). Construction began in 2004 and was completed in 2005 at a cost of \$13.9 million (Texas Woman's University 2005). The seven three-story buildings have 168 units, which could house approximately 314 residents (Texas Woman's University 2005). The complex was named Lowry Woods because of the wooded area next to the community (Texas Woman's University 2005). The buildings located within the complex were each named after residence halls that were demolished on campus.

The community features two-bedroom and three-bedroom units with two full bathrooms (Department of University Housing 2015). Each apartment also has a kitchen equipped with a refrigerator, a stove and an oven (Department of University Housing 2015). The Lowry Woods Community also has a community center that houses The Clubhouse an afterschool program, a computer lab, and lounge (Department of University Housing 2015b). The community center does not house a community dining hall. Students residing in Lowry Woods, below Texas Woman's University residency requirements, are required to purchase a Meal Plan (Texas Woman's University 2015c).

Grove Street Apartments



Figure 4.7 Grove Street Apartments

Grove Street Apartments are located behind Jones Hall on Grove Street, in Figure 4.7. The apartment complex is two-stories and has four apartments (Texas Woman's University *N.d.c.*). Each apartment features two-bedrooms and a full kitchen equipped with a refrigerator, stove and oven (Texas Woman's University *N.d.c.*). Grove Street apartments are located 1,158.47 feet, walking on a combinations of paths and roadways from the student union – the central location to purchase food on campus. Students residing in Grove Street Apartments, who are subject to the TWU's residency requirements, are required to purchase a Meal Plan (Texas Woman's University 2015c).

OFF-CAMPUS HOUSING

In addition to the University owned housing located on the Denton campus, Texas Woman's University offers off-campus University Housing. The off-campus apartment

units provides TWU the opportunity to expand the student housing program without building new residential halls. Dr. Nicholas reported that Texas Woman's University personnel works and lives at the complexes (Marketing and Communication 2013). According to the 2013 *Campus Living Handbook*, published by the Department of University Housing, maintenance and custodial work for TWU Select Apartments are coordinated by Scott Brown Properties (5).

On April 1, 2011 Texas Woman's University entered into a housing services agreement with Scott Brown Properties, Inc. that was set to expire on May 31, 2015(TWU 2011). Section 9 of the services agreement specifies that "the agreement is not a lease, but rather an agreement for management services" (Texas Woman's University 2011:5). The following 'Program Properties' are included in the initial the off-campus student housing agreement:

- Bent Tree apartment complex, located at 1000 N. Bell Avenue
- Lone Star apartment complex, located at 600 Texas Street
- Austin Place property, located at 1005 N. Austin Street (Texas Woman's University 2011:9,14)

A news release dated February 25, 2015 reported that Texas Woman's University entered into a second agreement with Scott Brown Properties for three additional apartment complexes (Marketing and Communication 2013). The addition of these three properties increased TWU's student housing program by 74 beds.

- Withers Place apartments, located at 517 Withers Street
- La Maureta apartments, located at 417 Withers Street

- Vineyard apartments, located at 902 Vine Street, in August 2013, (Marketing and Communication 2013).

TWU Select at Austin Place



Figure 4.8 Austin Place Apartments

TWU Select at Austin Place are university managed apartments that are located off campus on North Austin Street. See Figure 4.8. This property consists of 10 650 square-foot two-bedroom two bathroom apartments and nine 490 square-foot one-bedroom one bath apartments, each feature a full kitchen (Texas Woman’s University 2015e). Austin Place apartments are located 2,186.25 feet, walking on roadways, to the student union, the central location to purchase food on campus. Students residing in Austin Place, who are below Texas Woman’s University residency requirements, are required to purchase a Meal Plan (Texas Woman’s University 2015c).

TWU Select at Austin Villas

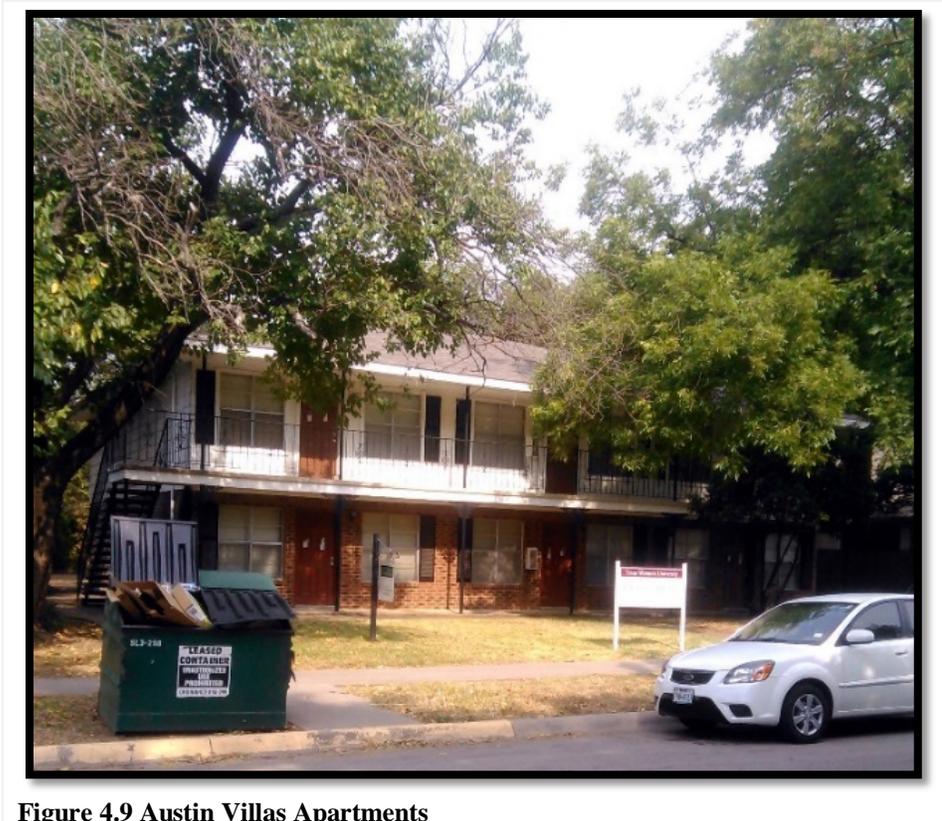


Figure 4.9 Austin Villas Apartments

TWU Select at Austin Villas are university managed apartments that are located off campus on North Austin Street. See Figure 4.9. This property consists of six 732 square-foot two bedroom apartments (Texas Woman’s University 2015e). Each apartment features one bathroom and a full kitchen (Texas Woman’s University 2015e). The Austin Villas Apartment complex is located 1,696.14 feet, walking on roadways, to the student union, the central location to purchase food on campus. Students residing in Austin Villas, who are below Texas Woman’s University residency requirements, are required to purchase a Meal Plan (Texas Woman’s University 2015c).

TWU Select at Bent Tree

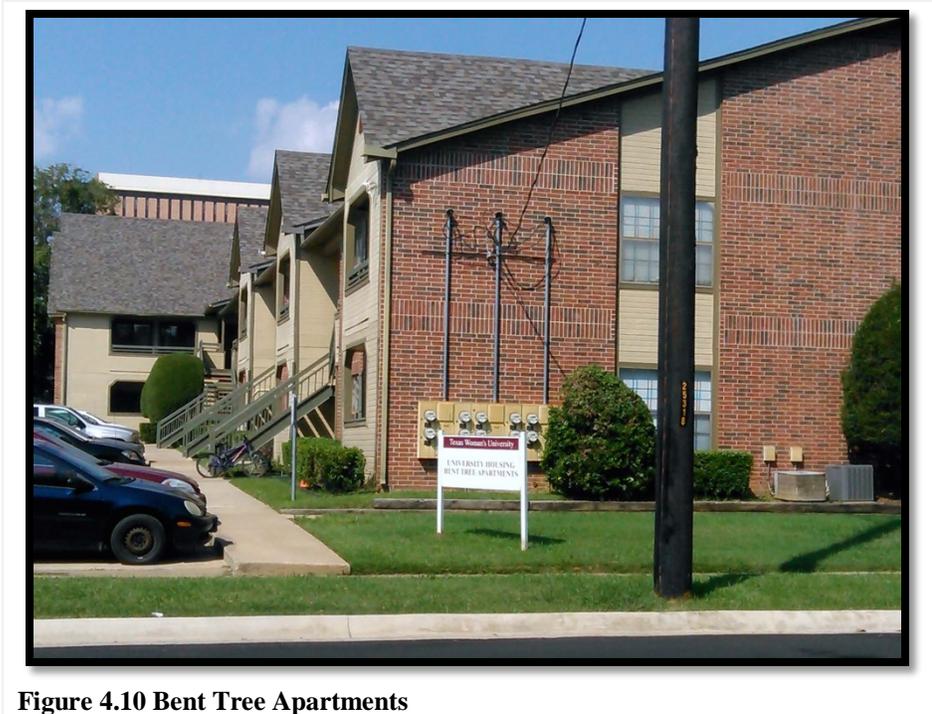


Figure 4.10 Bent Tree Apartments

TWU Select at Bent Tree Apartments are university managed located off campus on North Bell Avenue, in Figure 4.10. This property consists 20 apartments in total each features a full kitchen (Texas Woman’s University 2013; 2011). Some of the units are 600 square foot shared one-bedroom one bath apartments and 935 square foot shared two-bedroom two bath apartments (Texas Woman’s University 2015e). Bent Tree Apartments are located 1,791.35 feet, walking on roadways, from the student union, the central location to purchase food on campus. Students residing in Bent Tree, who are below TWU’s residency requirements, are required to purchase a Meal Plan (Texas Woman’s University 2015c).

TWU Select at La Maureta

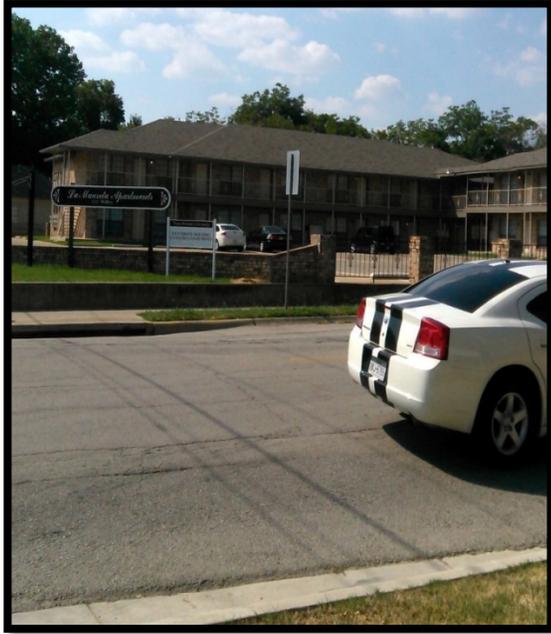


Figure 4.11 La Maureta Apartments

TWU Select at La Maureta are university managed apartments located off campus on Withers Street, in Figure 4.11. This property consists of shared one-bedroom and shared two-bedroom apartments (Texas Woman’s University 2015c). La Maureta Apartments are located 1,997.27 feet, walking on roadways, from the student union, the central location to purchase food on campus. Students residing at La Maureta, who are below TWU’s residency requirements are required to purchase a Meal Plan (Texas Woman’s University 2015c).

TWU Select at Lone Star



Figure 4.12 Lone Star Apartments

TWU Select at Lone Star are university managed apartments located off campus on Texas Street. See Figure 4.12. This property consists of 464 square foot private one-bedroom, 850 square foot shared two-bedroom, and 609 square foot shared one-bedroom apartments (Texas Woman's University 2015e). There are 34 apartments in total (Texas Woman's University 2011). Lone Star apartments are located 2,226.56 feet to the student union, the central location to purchase food on campus. Students residing at Lone Star Apartments, who are below Texas Woman's University residency requirements, are required to purchase a Meal Plan (Texas Woman's University 2015c).

TWU Select at the Vineyard



Figure 4.13 Vineyard Apartments

TWU Select at The Vineyard are university managed apartments located off campus on Vine Street, in Figure 4.13. This property consists of two apartments a 792 square foot two bedroom apartment and a 661 square foot two bedroom apartments (Texas Woman's University 2015e). Both apartments feature one bathroom and full kitchen (Texas Woman's University 2015e). Vineyard apartments are located 1,729.25 feet, walking on roadways from to the student union, the central location to purchase food on campus. Students residing at Vineyard Apartments, who are below Texas Woman's University residency requirements, are required to purchase a Meal Plan (Texas Woman's University 2015c).

TWU Select at Withers Place



Figure 4.14 Withers Place Apartments

TWU Select at The Withers Place are university managed apartments located off campus on Withers Street, in Figure 4.14. The property consists of 1001 square foot two-story, two-bedroom apartments (Texas Woman's University 2015e). Each apartment features two bathrooms and a full kitchen (Texas Woman's University 2015e). Withers Place Apartments are located 2,225.46 feet, walking on roadways to the student union—the central location to purchase food on campus. Students residing at Withers Place, who are below Texas Woman's University residency requirements, are required to purchase a Meal Plan (Texas Woman's University 2015c).

ON CAMPUS FOOD RETAIL ESTABLISHMENTS

Photo 16 shows the Student Union building that is located on Texas Woman's University-Denton campus. The basement of the student union houses The Underground cafeteria. The first floor of the Union houses the campus book store. The second floor houses Baker's Dozen, Chick-fil-A, and the Garden Room.



Figure 4.15 Student Union Building

Baker's Dozen



Figure 4.16 Baker's Dozen Food Counter

The Baker's Dozen is located inside of the Student Union building on the second floor near the Garden Room fast food court. Baker's Dozen is a fast-food counter sells hot drinks such as Starbuck's coffee, espresso, cappuccino, Tazo tea, and cold drinks such as frappucinos, and smoothies. Baker's Dozen also sells pre-packaged coffee-shop food items, pastries, muffins, and bagels (see Figure 4.16). Baker's Dozen hours of operation, are shown in Table 4.7.

Table 4.7 Hours of Operation for The Baker's Dozen

Fall 2015	Summer 2015
Monday-Thursday: 7:00 am-2:00 pm Friday: 7:00 am – 1:30 pm Saturday and Sunday: Closed	Monday – Friday: 7:30 am – 1:00 pm Saturday & Sunday: Closed

Source: <http://twu.campusdish.com/Locations/BakersDozen.aspx>

Chick-fil-A



Figure 4.17 Chick-fil-A Food Counter

The Chick-fil-A counter is located on the second floor of the Student Union next to the Garden Room food court. The fast-food counter, shown in Figure 4.17, sells fried chicken sandwiches, fried chicken nuggets, fried potato sliced into waffle shapes, and soda. Chick-fil-A hours of operation are shown in Table 4.8.

Table 4.8 Hours of Operation for Chick-fil-A

Fall 2015	Summer 2015: Beginning June 1, 2015
Monday – Thursday: 10:30 am – 6:00 pm	Monday – Friday: 11:00 am – 1:30 pm
Friday & Saturday: 11:00 am – 1:30 pm	Saturday & Sunday: Closed
Sunday: Closed	

Source: <http://twu.campusdish.com/Locations/ChickfilA.aspx>

Campus Bookstore

The campus bookstore is located inside of the Student Union, on the first floor, and sells a wide selection of convenience-store foods. The book store shelves are lined with easy to prepare heat-then-eat pre-packaged foods, cup-o-soup, ravioli, oatmeal, snack cakes, cookies, ice cream, chocolate bars, candy, slim jims, nuts, pretzels, fruit cups, potato chips, soft drinks, sports drinks, and other corn-sweetened beverages.

Figures 4.18 and 4.19 provide visual examples of foods sold in the bookstore. Campus Bookstore hours of operation, are shown in Table 4.9.



Figure 4.18 Snack Foods Sold in the Bookstore



Figure 4.19 Heat-Then-Eat Foods Sold in the Bookstore

Table 4.9 Hours of Operation for the Campus Bookstore

Fall 2015	Summer 2015-Beginning June 1
Monday – Thursday: 8:00 am to 5:00 pm	Monday – Wednesday: 8:00 am to 6:00 pm
Friday: 8:00 am – 3:00 pm	Thursday: 8:00 am to 5:30 pm
Saturday and Sunday: Closed	Friday: 9:00 am to 3:00 pm
	Saturday and Sunday: Closed

The Garden Room

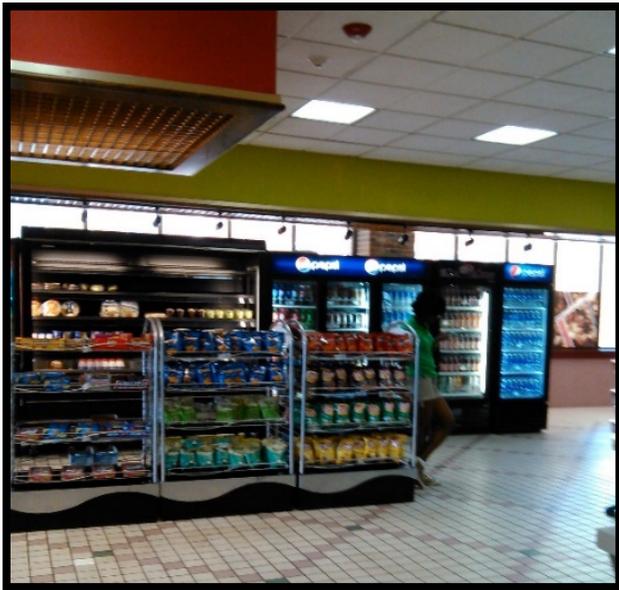


Figure 4.20 Retail Stands



Figure 4.21 Tortilla Fresca



Figure 4.22 Grille Works



Figure 4.23 Toss it Up



Figure 4.24 Sushic Counter

The Garden Room fast food court is located inside of the Student Union building, on the second floor. The food court is a large room with themed fast food counters around the perimeter and a bank of drink machines in the center. The fast-food counters include Toss it Up, Sushic, Grille Works, and Tortilla Fresca. Once students enter the food court, they stand in line at the fast-food counter of choice to select their food. Once finished making all of their food choices, the student stands in a second cashier line to pay. Figure 4.20 shows the retail stands displaying four shelves of snack cakes, eight shelves of chips, and a refrigerated unit filled with pre-packaged foods and drinks. The Toss It Up menu consists of American-style cuisine such as salads and pastas. Figure 4.23 shows the Toss It Up counter. The Sushic counter is actually a licensed food manufacturer with the State of Texas. Figure 4.24 shows the Sushic counter. The Grille Works menu consists of American-style cuisine such as hamburgers, fried chicken sandwiches, and French fries. Figure 4.22 shows the Grille Works counter. And the Tortilla Fresca menu includes Tex-

Mex cuisine such as tacos, burritos, quesadillas, and nachos. Figure 4.21 shows the Tortilla Fresca counter. Garden Room hours of operation, are shown in Table 4.10.

Table 4.10 Hours of Operation for the Garden Room

Fall 2015	Summer 2015
Monday – Thursday: 8:00 am – 7:30 pm	Monday – Friday: 7:30 am - 1:30 pm
Friday: 8:00 am – 2:00 pm	4:30 pm - 6:30 pm
Saturday & Sunday: Closed	Saturday & Sunday: 11:00 am - 1:30 pm
	4:30 pm - 6:30 pm

Source: <http://twu.campusdish.com/Locations/TheGardenRoom.aspx>

The Underground

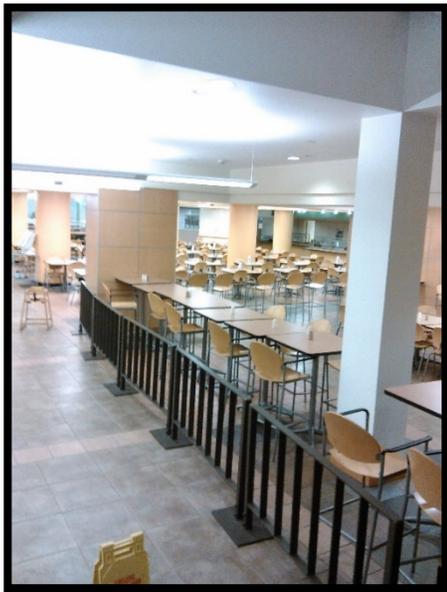


Figure 4.25 Cafeteria Dining Area

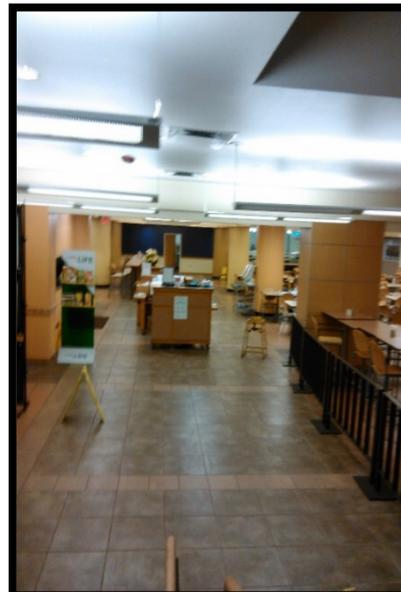


Figure 4.26 Cafeteria Entrance

The Underground cafeteria is located in the basement of the Student Union. I offer Figures 4.25 and 4.26 to illustrate the cafeteria dining area. The windowless cafeteria has two main food lines. One food line runs along the back wall and the other along the wall located to the right. The all-you-can-eat cafeteria serves the bulk of the meals for students who are required to purchase meal plans. The cafeteria serves breakfast, lunch, and dinner. The food selections vary daily.

The Underground hours of operation are shown in Table 4.11.

Table 4.11 Hours of Operation for the Underground

Fall 2015	Summer 2015
Monday - Thursday: Breakfast: 7:00 am – 9:30 am Lunch: 11:00 am – 2:00 pm Dinner: 4:30 pm – 8:00 pm Friday: Breakfast: 7:00 am – 9:30 am Lunch: 11:00 am – 2:00 pm Dinner: 4:30 pm – 7:00 pm Saturday & Sunday Brunch: 11:00 am – 1:30 pm Dinner: 5:00 pm – 7:00 pm	Closed for the summer

Source: <http://twu.campusdish.com/Locations/TheUnderground.aspx>

Java City



Figure 4.27 MCL Building

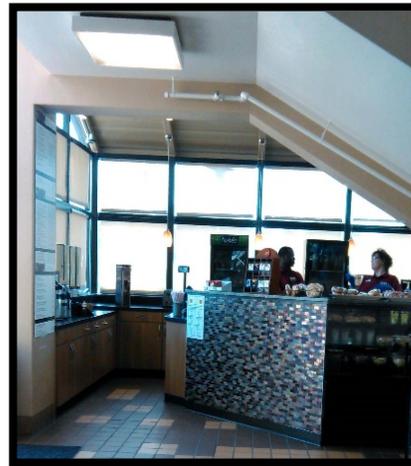


Figure 4.28 Java City

Java City is located inside of the MCL building, 1314 Bell Avenue, in the back corner of the first floor. I provide Figures 4.27 and 4.28 to show the MCL building and the Java City food counter. The menu at Java City includes coffee, tea, pre-packaged snacks, and cold foods. Java City hours of operation, are shown in Table 4.12 on page 72.

Table 4.12 Hours of Operation for Java City

Fall 2015	Summer 2015
Monday – Thursday: 7:00 am – 7:00 pm Friday: 7:00 am – 1:30 pm Saturday: Open based on Saturday class schedule Sunday: Closed	Closed for the summer

Source: <http://twu.campusdish.com/Locations/JavaCityMCL.aspx>

C3 @ the Commons

The C3@ the Commons Store is located inside of the Guinn-Stark Commons building at 1721 Bell Avenue. The small store sells heat-and-eat convenience food, snacks, and beverages. C3@ The Commons hours of operation, are shown in Table 4.13.

Table 4.13 Hours of Operation for C3@ The Commons

Fall 2015	Summer 2015
Monday – Wednesday: 11:00 am-11:00 pm Thursday: 11:00 am – 9:00 pm Friday: 2:00 pm – 9:00 pm Saturday: 5:00 pm – 9:00 pm Sunday: 5:00 pm – 11:00 pm	Closed for the summer

Source: <http://twu.campusdish.com/Locations/C3TheCommons.aspx>

Which Wich

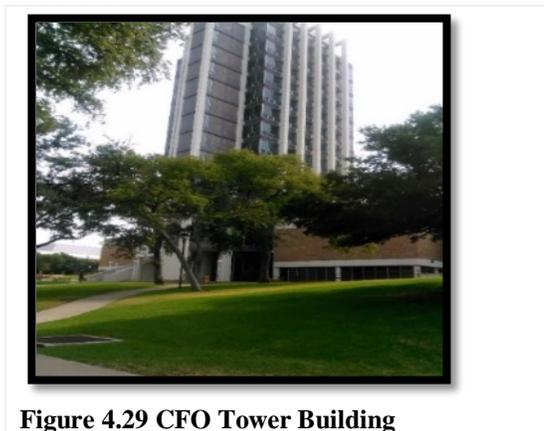


Figure 4.29 CFO Tower Building

Which Wich is located inside of the CFO Building, on the first floor, 1315 Bell Avenue, in Figure 4.29. Photo 30 shows a walking path leading to the CFO building. The menu includes sandwiches, salads, and pre-packaged cold foods. Patrons mark a pre-printed bag with what they want included on their sandwich or salad. This location also has a refrigerated case that sells Sushic products as shown in photo 25. Which Wich is a popular food retail establishment. Photo shows the Which Wich counter. The Monday-Thursday lunch rush is from about 11:30 to 1:00, and often results in a line that extends from the Which Wich counter and winds around the elevator bank. After the student waits in the line to order and pay, he or she is asked to move away from the food counter to wait for his or her name to be called once their order is ready. Occasionally the wait time reaches 20 minutes or more. Which Wich hours of operation, are shown in Table 4.14 on page 74.



Figure 4.30 Which Wich Counter

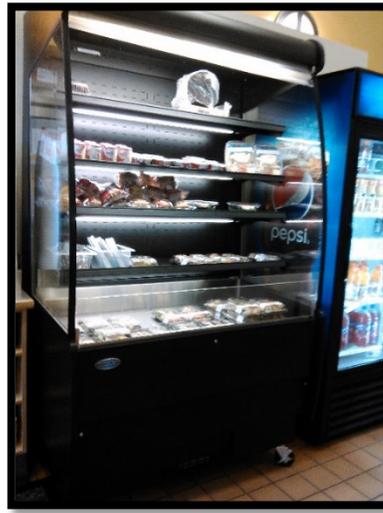


Figure 4.31 Refrigerated Case

Table 4.14 Hours of Operation for Which Wich

Fall 2015	Summer 2015-Beginning June 1
Monday – Thursday: 7:00 am – 8:00 pm Friday: 7:00 am – 1:30 pm Saturday & Sunday: Closed	Monday – Thursday: 7:00 am – 7:00 pm Friday: 7:00 am – 1:30 pm Saturday & Sunday: Closed

Source: <http://twu.campusdish.com/Locations/WhichWich.aspx>

Campus Vending Locations

I walked through each building on campus to identify public vending areas. Then using the *Campus Food Environment Measure-Vending Inventory* I collected data about the vending location, number of vending machines, type machine (beverage or food), payment methods, if the machine displays message promoting healthy food choices, and the products sold. Data suggests a high prevalence of vending machines as a food source located on the Denton campus. Public vending areas were identified in the following buildings: Admission and Registration Building (ADM), Administrative Conference Tower (ACT), Arts and Sciences Building (ASB), Music Building, Ann Stuart Science Complex, Nutrition, Textiles, and Human Development Building (HDB), Old Main Building (OMB), CFO Tower (CFO), Multipurpose Classroom Laboratory Building (MCL), Blagg Huey Library, and Student Union (SU). See Figures 4.32, 4.33, 4.34, 4.35, 4.36, and 4.37.

There are two types of vending machines located on campus, they include beverage and food machines. The beverage machines sold soda, water, energy drinks, lemonade, and coffee drinks. The food machines sell potato chips, corn chips, crackers, pretzels, pork rinds, cookies, cupcakes, snack cakes, rice crispy bars, granola bars, candy, and gum. None of the food vending machines sell fresh foods.



Figure 4.32 HBD Vending Area

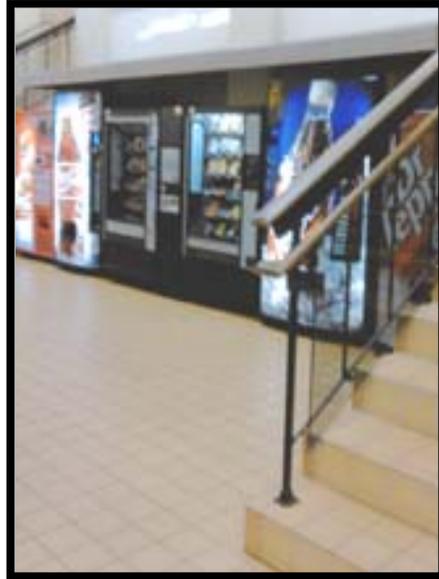


Figure 4.33 CFO Vending Area

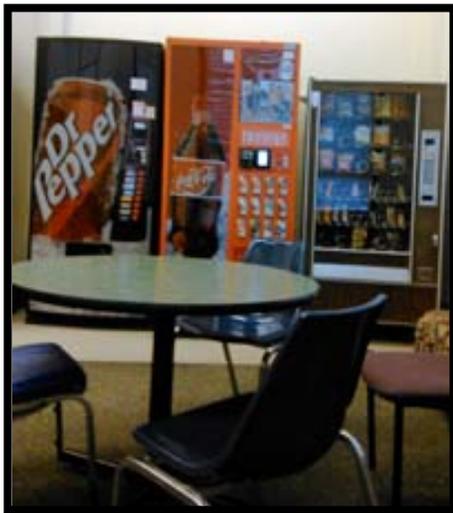


Figure 4.34 Jones Hall Vending Area



Figure 4.35 ASB Vending Area



Figure 4.36 OMB Vending Area



Figure 4.37 Library Vending Area

Most of the food vending machines were embellished with stickers to designate ‘healthy choices’. In theory, there appears to be no down-side to a program that informs students about how to make healthy food choices. However in practice data suggests inconsistencies in the programs educational stickers and in the identification of ‘healthy choices’ sold inside the machines.

OFF CAMPUS: NEIGHBORHOOD FOOD RETAIL ESTABLISHMENTS

Data collection for off campus food retail establishments was collected in two phases. An online search of restaurants near Texas Woman’s University led me to the City of Denton’s website and the restaurant scores that they publish monthly. I used this list to identify locations that I thought might be close to Texas Woman’s University. Then I walked through the surrounding areas with a Wheel Master Pro measurement tool to identify places that were within one-quarter mile. During the month of August 2015, 10 retail food establishments existed within one-quarter mile walking distance, using roads or university paths, from at least one university housing location. The list includes:

CVS Pharmacy, Gana Shell gas station, Giuseppe's Italian Restaurant, Guatelinda Café, Johnny Joe's Quick Stop, Lenny's Subs, Natural Grocers, Pizza Patron, Pizza Hut, and Walgreens. During the second phase, I used the list of off campus food retail outlets to visit each location and complete a *Campus Food Environment Measure-Restaurant and Store Inventory* for each location.

CVS Pharmacy

CVS Pharmacy is located at 116 West University Drive, Denton, Texas 76201. Their website is http://www.cvs.com/stores/cvs-pharmacy-address/116-University-Drive-Denton-TX-76201/storeid=6856?WT.mc_id=LS_GOOGLE_6856. CVS is open 24 hours a day, 7 days a week. I walked to this location from Lowry Woods Apartments. I walked on the path through Lowry woods, then crossed the intersection at Locust Street and University Drive, and then walked through the parking lot of Natural Grocers. The intersection was difficult to navigate. There is a push button for crossing the street; however, it took a while for the light to turn, and when it did, the crossing light did not seem to last long enough to get across the six lanes of traffic driving at 35 miles per hour. In addition to being a pharmacy, CVS also sells beauty products, household items, heat-then-eat foods, snack foods, and drinks. No fresh fruit or vegetables were sold at this location. The store accepts the following payment methods: credit/debit cards, cash, and SNAP card. The Supplemental Nutrition Assistance Program (SNAP) is a hunger safety net program administered by the U.S. Department of Agriculture (Benefits.Gov 2015). Qualifying individuals receive a monthly stipend that they can use to purchase food. Program participants use their SNAP card to pay for food items.

Gana Shell Gas Station

Gana Shell gas station is located at 1823 North Elm Street, Denton, Texas 76201. This gas station is within walking distance of Lowry Woods; however, it requires crossing two main intersections and walking along University Drive. The gas station sells soda, sports drinks, potato chips, candy, chocolate bars, ice cream, cookies, snack cakes, and heat-then-eat foods. The store did not sell any fresh fruits or vegetables.

Giuseppe's Italian Restaurant

Giuseppe's Italian Restaurant is located at 821 North Locust Street, Denton, Texas 76201. This is a full-service Italian restaurant that is located in a beautiful old home surrounded by a bed and breakfasts. The restaurant operates for lunch and dinner service. During lunch, meals range from \$7.95 to \$13.95, during dinner, meals range from \$7.95 to \$15.95. The restaurant serves lunch Monday-Friday 11am to 2pm and on Sundays from 11am to 2pm. Giuseppe's serves dinner Monday-Thursday from 5pm to 9pm, Fridays and Saturdays from 5pm to 10 pm, and Sundays 5pm to 9pm.

Guatelinda Café

Guatelinda Café is located at 1813 North Elm Street, Denton, Texas 76201. The small neighborhood restaurant sells Guatemalan foods. The menu items range in price \$6.00 for Huevos Al Gusto to \$8.00 for Pollo Frito. The restaurant is open Tuesday-Saturday from 7:00 am to 7:30 pm, and Sundays from 8:00 am-3:00pm.

Johnny Joe's Quick Stop

Johnny Joe's Quick Stop is a convenience store and gas station located at 500 North Bell Avenue, Suite 112, Denton, Texas 76209. In addition to gas, the small

convenience store sells soda, sports drinks, heat-then-eat foods, candy, potato chips, popcorn, cookies, and snack cakes. The store also has a food counter that sells fried foods. While the gas station did not sell fresh vegetables it did have a small basket with three pieces of whole fruit. The gas station was busy when I visited, there were several people in the back of the store sitting on stools playing video games. The store accepts the following payment methods: credit/debit cards, cash, and SNAP card.

Lenny's Subs

Lenny's Subs is located at 111 East University Drive, Suite #102, Denton, Texas 76209. Their website is <http://www.lennys.com/>. The limited-service restaurant is open Monday through Saturday from 11:00 am to 9:00 pm, and Sunday from 11:00 am to 4:00 pm. When I walked in the door it smelled like cooking meat. Lenny's sells cheesesteaks and sub sandwiches that range in price from \$4.55 to \$10.75.

Natural Grocers

Natural Grocers is located at 110 West University Drive, Denton, Texas 76201. Their website is www.naturalgrocers.com. The health food store is open Monday through Saturday from 8:00 am to 9:04 pm, and Sunday 8:00 am to 7:06 pm. The specialty grocery store sells only organic produce, pasture-based dairy, bulk grains, healthy products that do not contain hydrogenated oils, bulk foods, vitamins, household, and beauty products. The store has a bag-free checkout policy. So customers must bring their own bags. The store carries a wide assortment of healthy food for consumers who can afford to shop there. Example products and prices, a package of hot dogs is \$ 6.79, a 12oz box of cereal is \$4.99, and a pint of cherry tomatoes is \$3.69.

Pizza Hut

Pizza Hut is located at 227 West University Drive, Denton, Texas 76201. Their website is <https://order.pizzahut.com/home>. The restaurant sells pizza, breadsticks, salad, and chicken wings that range in price from \$6.99 to \$11.99.

Pizza Patron

Pizza Patron is located at 111 East University Drive, Suite 101, Denton, Texas 76209. Their website address is <http://pizzapatron.com/>. The restaurant sells pizza and chicken wings. A large cheese pizza ranges from \$3.99 at lunch to \$6.99 at dinner. In addition to pizza with meat toppings, Pizza Patron also has only cheese and vegetable toppings. The location is open Monday – Thursday and Sunday from 11:00 am to 10:00 pm.

Walgreens

Walgreens is located at 101 West University Drive, Denton, Texas 76201. They are open 24 hours a day, 7 days a week and their website is <http://www.walgreens.com/locator/walgreens-101+w+university+dr-denton-tx-76201/id=5161>. In addition to the pharmacy, Walgreens sells frozen food (i.e., pizza, burgers, ice cream), heat-then-eat-foods (i.e., soup, chili, boxed meals), cereal, chips, soda, fruit juice, dairy (i.e., milk, butter, cheese, yogurt), eggs, bread, boxed cake mix, candy, snack cakes, cookies, as well as, alcohol. Walgreens did not sell fresh vegetables for fruit. Walgreens accepts the following payment methods credit/debit cards, cash, and SNAP card.

CHAPTER V

FINDINGS

The main objective of this research was to examine and describe the social structure of the campus food environment to understand structural barriers to the physical availability of food for students who live in university housing. I conducted a review of literature and developed the *Campus Food Environment Measures* Inventory and *Pedestrian Network Observation Tool* to aid in the data collection process. This chapter is divided into three main categories to present ethnographic findings, spatial findings, and document review findings.

ETHNOGRAPHIC FINDINGS

Inconsistencies in Educational Stickers

Data showed an inconsistency in both the names of programs, and nutritional facts associated with the program. There is significant difference in the nutrition content across programs. For example, one machine with a choice plus label may have 250 calories versus the vending machine with balanced choices 600 calories. This is a huge discrepancy for students who are trying to make healthy choices but use vending machines in multiple locations. I offer Figures 5.1, 5.2, 5.3, and 5.4 (on page 82) to illustrate the differences between vending machine found on campus machines.

Figure 5.1 shows the Balanced Choices nutrition facts vending machine sticker. The following information is provided on the sticker, *better-for-you snacks*, 250 calories or

less, total fat less 35%, 10% or less saturated fat, 350mg sodium or less. Figure 5.2 shows the Balanced Choices vending machine sticker. The following information is provided on the sticker, *better for you products*, 600 calories or less, 7 g of fat or less, less than 30% calories from fat. Figure 5.3 shows the choice plus vending sticker. The following information is provided on the sticker, *choice plus snacks*, 250 calories or less, 10g of fat or less, 3g of saturated fat or less, 0g of trans fat, 230mg sodium or less, 20g of sugar or less. Figure 5.4 shows the Balanced Choices vending sticker. The following information is provided on the sticker, *balanced choices snacks*, 260 calories or less, 7 net grams of fat or less, 250 mg of sodium or less.

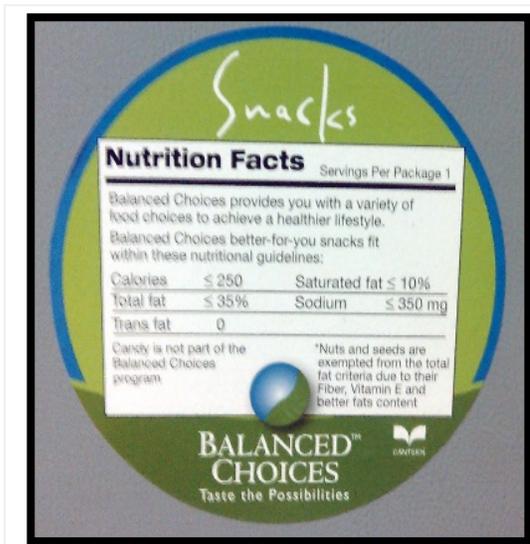


Figure 5.1 Nutrition Facts

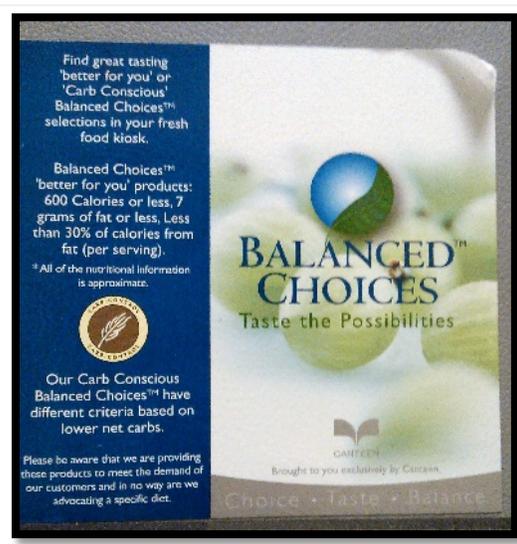


Figure 5.2 Balanced Choices



Figure 5.3 Choice Plus Snacks



Figure 5.4 Balanced Choices Vending Sticker

Inconsistencies in the Identification of ‘Healthy Choices’

Visual data collected from multiple machines shows the following foods in campus vending machines labeled as healthy choices, pork rinds, Heath candy bar, Hostess Cupcakes, chocolate Buddy Bars, and vanilla sandwich cookies. According to the informational stickers, foods with a green leaf are designated as healthy choices. The campus food vending machines stocked packaged snack foods, though none of the vending machines stocked fresh fruits or fresh vegetable options. I offer Table 5.1 to show a few examples (data revealed many more incidences than shown below) of unhealthy snack foods that are labeled as healthy choices.

Table 5.1 Foods Labeled as Healthy Choices in Campus Vending Machines

	Sun Chips		Granola Bars		Pretzels
	Pretzels		Granola Bars		Granola Bars
	Pork Rinds		Chocolate Buddy Bar		Granola Bars
	Cheese Crackers				Vanilla Sandwich Cookies
	Candy Bar				
	Cupcake				

Pedestrian Structural Barriers to Food Access

Many of Denton roadways are not built to full classification standards, meaning that they “currently exist at a capacity or condition less than designated per code”(Freese and Nichols 2012:10). This deficiency provides the opportunity to improve pedestrian conditions as roadway improvement or expansion projects are implemented (Freese and Nichols 2012). This idea is supported by the Texas Department of Transportation (TxDOT), as evidenced by the March 23, 2011 TxDOT memorandum sent to all district engineers in Texas, “This USDOT policy encourages the incorporation of safe and convenient walking and bicycling facilities into transportation projects” (Freese and Nichols 2012:16).

In an effort to facilitate walkable streets and a bicycle-friendly environment, the City of Denton passed Ordinance No. 2011-046, “Safe Passing Ordinance.” The ordinance defines the obligation for motorists when passing vulnerable road users (i.e. pedestrians and bicyclists) subject to fine up to \$200.00 (City of Denton 2011).

University Drive and North Elm Street were identified as roadways with significant barriers for pedestrians crossing (Freese and Nichols 2012). Both streets are in the walking area for TWU students. Arterial roadways are typically identified as high speed, high traffic streets can pose safety concerns for students who need to cross (Freese and Nichols 2012). Traffic control measures such as traffic signals and stop signs can increase safe crossing (Freese and Nichols 2012).

The main intersections that students who live in Lowry Woods, Stark Hall, and Guinn Hall are likely to cross to access food are North Locust Street a highly traveled, double lane, and one-way street with a 30 mile per hour speed limit. And University Drive a highly traveled, four lane, road with multiple speed limits ranging from 30 miles per hour to 45 miles per hour. Figure 5.5 depicts heavy traffic at the crossing intersection.

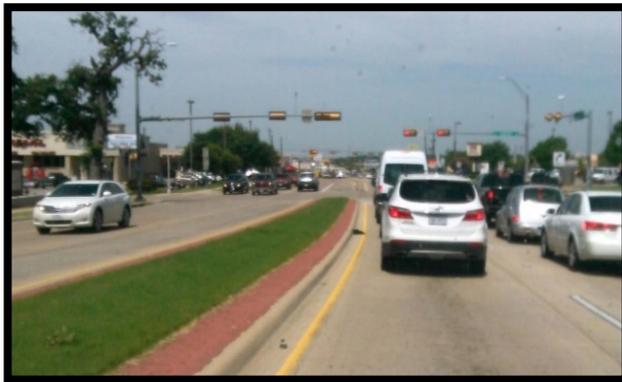


Figure 5.5 Intersection of University Drive and North Locust Street

The main intersections that students who live in Jones Hall and Grove Street Apartment are likely to cross to access food are North Bell (a highly traveled, two lane roads with a 20 mile per hour speed limit) and Administration Drive (a two lane road, with a 20 mile per hour speed limit). I illustrate multiple crossing locations in Figures 5.6, 5.7, and 5.8.



Figure 5.6 Intersection at Administration Drive and North Bell Avenue



Figure 5.7 Student Paved Walkway

I examined the existing pedestrian conditions to describe barriers and facilitators that could impact pedestrian food access for Texas Woman's University residential students.



Figure 5.8 Crossing at MCL

Walking from Austin Street to campus food establishments. I walked down the sidewalk on Austin Street, and took a right onto to Sawyer Ave. I did not have to cross any streets the sidewalk is continuous. I walked across Oakland Street. The intersection does not have any crossing light; the speed limit is 20 miles per hour. Oakland is a two-lane road; the traffic drives in both directions. I then used campus paths to access Which Wich inside the CFO building.

Walking from Austin Street to off-campus food establishments, I walked down Austin Street towards downtown Denton. There is a sidewalk on both sides of the street. The sidewalk is narrow; only two people can walk side-by-side. The four-way intersection at Hann Street has a stop sign (not four-way-stop). The sidewalk is covered with a thick layer of soil and gravel, making it difficult to navigate. One day there was even a tree that had fallen across the road. The intersection of Austin and Marshall has a stop sign (not a four way stop). To reach Giuseppe's Italian restaurant I had to cross North Locust Street. Crossing North Locust Street is a challenge. I stood for approximately four minutes in the beating sun (there is no shade at the intersection) before I was able to cross. The speed limit along Locust Street is 35 miles per hour and there is no signal to stop traffic. Even though Locust is a one-way street there are two lanes of traffic that you have to navigate. I felt like I was a pawn in a game of frogger.

The following images show physical barriers in the neighborhood surrounding TWU where student apartments are located. See Figures 5.10, 5.11, 5.12, and 5.13. Figure 5.10 shows Oakland Avenue where pedestrians share the roadway with two lanes of parked cars, two lanes of moving cars/motorized carts.

Figure 5.12 shows Oakland Street where landscaping has become so overgrown that it is a potential hazard to pedestrians. A large sunflower bush scraped my arm and a pecan tree limb brushed across the top of my head as I walked down the street.



Figure 5.9 Missing Pieces of Sidewalk



Figure 5.10 Oakland Avenue



Figure 5.11 Overgrown Landscaping

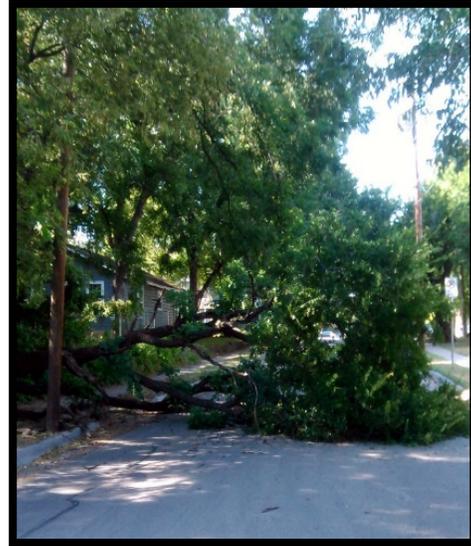


Figure 5.12 North Austin Street



Figure 5.13 Crossing Sign

This evidence is important because of the University's Residency requirements for students who must reside on campus. According to U.S. News (2015) 24 percent of Texas Woman's University students live in university operated housing and only 13 percent of students have cars on campus. Because of the lack of vehicle access, it is important to study structural barriers to food access for pedestrians within a quarter-mile walk from university housing locations.

SPATIAL ACCESSIBILITY AND AVAILABILITY FINDINGS

I used *Campus Food Environment Measures*-Restaurant, and Store inventories to collect density, variety, diversity, and proximity data. This data was analyzed with GIS to describe the campus food environment.

Density Findings

Eighteen food establishments exist within a one-quarter mile walking distance from at least one university housing location. These include: Baker's Dozen, C3 @ The Commons, Campus Bookstore, Chick Fil A, CVS Pharmacy, Gana Shell, Guatelinda Café, Giuseppe's Italian Restaurant, Java City, Johnny Joe's Quick Stop, Lenny's Subs, Natural Grocers, Pizza Hut, Pizza Patron, The Garden Room, The Underground, Walgreens, and Which Wich.

Spatial Food Variety Findings

Business Type/Classification. Of all food establishments within one-quarter mile from at least one university housing residence. University housing and the six types of retail food establishments are summarized in Table 5.2 on page 91.

Table 5.2 University Residences and Number of Food Establishments by Type

University Housing	Convenience Store	Drug Store	Grocery Store	Restaurant Full	Restaurant Limited	Snack Bar	Total
Guinn Hall	2	0	0	0	5	1	8
Jones Hall	1	0	0	0	4	2	7
Stark Hall	2	0	0	0	4	2	8
Lowry Woods	2	2	1	0	6	1	12
Grove Street	1	0	0	0	4	2	7
TWU Select at Austin Place	0	0	0	1	0	0	1
TWU Select at Austin Villas	0	0	0	1	1	0	2
TWU Select at Bent Tree	1	0	0	0	1	1	3
TWU Select at La Maureta	1	0	0	0	0	0	1
TWU Select at Lone Star	0	0	0	0	0	0	0
TWU Select at The Vineyard	1	0	0	0	0	0	1
TWU Select at Withers Place	1	0	0	0	0	0	1

Spatial Food Diversity and Proximity Findings

The types of restaurant cuisines within a one-quarter mile walking distance of each university housing residence. Future research should examine whether culturally appropriate food options are available. As an anecdotal observation, it does not appear that many international or minority students have access to such foods.

Guinn Hall. There are nine different types of food cuisines that are within a one-quarter mile walking distance from Guinn Hall. The types of cuisine include: American, deli or sub sandwiches/salads, pizza, convenience foods /snacks, chicken, burgers, coffee/tea, sushi, and Mexican. Eight food establishments are within a one-quarter mile walking distance from Guinn Hall. These include: Lenny’s Subs, Pizza Patron, C Store, The Underground, Chick Fil A, The Garden Room, Baker’s Dozen and Texas Woman’s University bookstore.

Jones Hall. There are eight different types of food cuisines that are within a one-quarter mile walking distance from Jones Hall. The types of cuisine include: American, deli or sub sandwiches/salads, convenience foods/snacks, chicken, burgers, coffee/tea, sushi, and Mexican. The seven food establishments within a quarter-mile walking distance include: Java City, Which Wich, The Underground, Chick Fil A, The Garden Room, Baker's Dozen and Texas Woman's University bookstore.

Stark Hall. There are eight different types of food cuisines that are within a one-quarter mile walking distance from Stark Hall. The types of cuisine include: American, deli or sub sandwiches/salads, convenience foods/snacks, chicken, burgers, coffee/tea, sushi, and Mexican. Eight food establishments are within a one-quarter mile walking distance from Stark Hall. These include: C Store, Java City, Which Wich, The Underground, Chick Fil A, The Garden Room, Baker's Dozen and Texas Woman's University book store.

Lowry Woods Community. There are 11 different types of food cuisines that are within a one-quarter mile walking distance from Lowry Woods Community. The types of cuisine include: fresh whole fruits and vegetables, Guatemalan, American, deli or sub sandwiches/salads, pizza, convenience foods/snacks, chicken, burgers, coffee/tea, sushi, and Mexican. Ten food establishments are within a one-quarter mile walking distance from Lowry Woods Community. These include: Lenny's Subs, Pizza Patron, Natural Grocers, CVS Pharmacy, Guatelinda Café, Gana Shell, Walgreens, The Underground, Chick Fil A, the Garden Room, Baker's Dozen, and Texas Woman's University bookstore.

Grove Street Apartments. There are nine different types of food cuisines that are within a one-quarter mile walking distance from Grove Street Apartments. The types of cuisine include: American, deli or sub sandwiches/salads, pizza, convenience foods/snacks, chicken, burgers, coffee/tea, sushi, and Mexican.

Seven food establishments are within a quarter-mile walking distance from Grove Street Apartments. These include: Java City, Which Wich, The Underground, Chick Fil A, The Garden Room, Baker's Dozen and Texas Woman's University bookstore.

TWU Select at Austin Place. There is one type of food cuisine that is within a one-quarter mile walking distance from TWU Select at Austin Place. The type of cuisine is: Italian. One food establishment is within a one-quarter mile walking distance from TWU Select at Austin Place. This establishment is Giuseppe Italian Restaurant.

TWU Select at Austin Villas. There are two different types of food cuisines that are within a one-quarter mile walking distance from TWU Select at Austin Villas. The types of cuisine include: Italian and deli or sub sandwiches/salads.

Two food establishments are within a one-quarter mile walking distance from TWU Select at Austin Villas. These include Giuseppe Italian Restaurant and Which Wich.

TWU Select at Bent Tree Apartments. There are three different types of food cuisines that are within a one-quarter mile walking distance from TWU Select at Bent Tree Apartments. The types of cuisine include: convenience foods/snacks, coffee/tea, and deli or sub sandwiches/salads. Three food establishments are within a quarter-mile walking distance from TWU Select at Bent Tree Apartments. These include Johnny Joe's Quick Stop, Java City, and Which Wich.

TWU Select at La Maureta. There is one different type of food cuisine that is within a one-quarter mile walking distance from TWU Select at LaMaureta. The type of cuisine is convenience foods/snacks. One food establishment is within a one-quarter mile walking distance from TWU Select at LaMaureta. This food establishment is Johnny Joe's Quick Stop.

TWU Select at Lone Star. There are no food establishments are within a one-quarter mile walking distance from TWU Select at Lone Star. No food establishments are within a one-quarter mile walking distance from TWU Select at Lone Star.

TWU Select at the Vineyard. There is one type of food cuisine that is within a one-quarter mile walking distance from TWU Select at Vineyard. The type of cuisine is convenience foods/snacks. One food establishment is within a one-quarter mile walking distance from TWU Select at Vineyard. This food establishment is Johnny Joe's Quick Stop.

TWU Select at Withers Place. There is one type of food cuisine that is within a one-quarter mile walking distance from TWU Select at Withers Place. The type of cuisine is convenience foods/snacks. One food establishment is within a one-quarter mile walking distance from TWU Select at Withers Place. This food establishment is Johnny Joe's Quick Stop.

This data is important because it suggests a low density of food establishments within a quarter-mile proximity of university housing. The limited amount of variety in the types of food retail outlets indicate that a majority of the accessible food choices are sold by either fast-food or convenience store type businesses. One of the TWU select

properties does not have any food retail outlets within a quarter-mile walking distance, and three of the TWU Select Properties only have walking access to one food retail outlet. Unfortunately, the one location is a gas station. The variety data also suggest both a lack of access to healthy foods, and to culturally appropriate foods. So what does this all mean-why are these findings so important? First they confirm the USDA findings that Texas Woman's University-Denton is located in a food desert. More importantly, the campus is a food swamp which carries with it serious health implications.

DOCUMENT ANALYSIS FINDINGS

I reviewed documents through a sociological lens. From this perspective I viewed the documents as social facts. I use constant comparison and thematic analysis to identify emerging codes and themes. In addition to themes that emerged, as I read the documents, I not only found inconsistencies but also found issues with food access in relation to campus meal plans. In the remaining paragraphs of this chapter, I present and describe what was found, and discuss why the findings matter.

University Housing Residency Requirements

All TWU full-time single undergraduates who have not completed 60 credit hours are required to live in University residential communities unless one of the following exceptions apply: 21 years of age or older, Active duty military or veterans of military service, Living with parents or legal guardians within the commuting distance, With children, Completed 48 hours with a cumulative GPA of 3.0 (Texas Woman's University 2015).

In total, 2,125 undergraduate students lived in university housing during the fall 2015 semester (Duncan 2015). Not all of the students lived on campus in university housing or in TWU Select Apartments because of limited housing spaces. A total of 272 undergraduate students were placed in off-campus housing because university housing was full (Duncan 2015). 43 students live in temporary housing and the remaining 209 students live in semi-permanent housing (Duncan 2015). The 43 students are housed at the Holiday Inn on Centre Place Drive off I-35 in Denton (Duncan 2015). The hotel is approximately 2.9 miles from campus. These students will be moved housing on-campus when space permits (Duncan 2015). A second group of 229 Texas Woman's University first year students and sophomore students were moved into Denton apartments where they will live for the fall 2015 semester (Duncan 2015). I was unable to determine how far the apartments were away from campus because the apartment names were not identified in any of the public documents that I reviewed. According to Monica Mendez-Grant, Vice President for Student Life, in 2014, 43 students were temporarily housed at the hotel until they could be moved into student housing (Duncan 2015). A woman, who identified herself as a Texas Woman's University student, posted a comment on August 22, 2015, online in response to the Denton Record Chronicle article about the overbooked housing.

Upper class housing the day of choosing was FULL! I was put on a huge waiting list, and had to make another arrangements, because there was no room, I had to find off-campus housing which in turn I lost the financial aid for Housing (Duncan 2015).

These are students who are required to live in university housing, but there is no available space. While sitting in the student union, I overheard a conversation among a group of five female students. They were talking loudly and making various hand gestures. One of the girls was in tears as she spoke about living in a hotel off-campus. One of the other female students joined the conversation by saying that she missed her first day of classes because the shuttle from the hotel to campus did not run often enough. At the same time, a third female student shared her experience at the hotel. She expressed how angry she was because she had made several complaints to the front desk about necessary room repairs and was told by the hotel staff that it was not their job to help her that she needed to talk to the university.

Residential Segregation by Classification

A common societal practice among universities is to stratify students into groups based on the number of earned semester hours. For example, a student who has earned fewer than 29 semester hours is classified as a first year (FTIC), 30 to 59 semester hours is classified as a sophomore, 60 to 89 semester hours is classified as a junior, and 90 or more semester hours is classified as a senior (Texas Woman's University 2015). Viewing Texas Woman's University practice of priority room selection, and meal plan requirements which are based on student classification, through a sociological lens suggests that the practice, potentially contributes to stratification and spatial inequalities in food access among residential students within the campus food environment. As a sociologist, I view residential-student food access issues as part of a broad social system. One of the terms commonly used by sociologists is stratification. Stratification is used to

describe systemic inequalities among a group of people that occur as a consequence of social processes (Conley 2011). The resulting food access inequality, while rooted in the norm operations of the institution's regulatory policies (such as *2015-2016 Priority Room Selection Classifications-At-A-Glance*) is not the societal dysfunction classification in and of its self, but rather an unintended consequence that is compounded when paired with the physical structure of the campus housing environment of the Denton campus (Conley 2011).

External Environmental Structure-Student Place of Origin

“TWU does not charge high tuition, yet TWU students require larger amounts of federal grant aid and loans than the national average.” (TWU 2012). Data from Texas Woman's University Visioning Committee's (2012) Final Report, the 2014 Fact Book, and Feeding America's Map the Meal Gap, suggest that a student's place of origin has the potential to impact limited financial resources and family support. The analysis identified a potential threat of financial stress, specifically “TX-poverty levels” (Texas Woman's University 2012). The report indicated that approximately 80 percent of Texas Woman's University undergraduate students received need-based financial aid 4,700 students received a Pell grant in 2012 (Texas Woman's University 2012). The average indebtedness at graduation for Texas Woman's University students is \$35,000 higher than the national average of \$28,000, even though the tuition at TWU is on the lower end of average for public universities in Texas (Texas Woman's University 2012). I provide Table 5.3 to show an alphabetical list of the top Texas counties of origin and rate of food insecurity based on enrollment for the Denton campus.

Table 5.3 Enrollment by Texas County of Origin and Rate of Food Insecurity

Texas County	Enrollment	%Food Insecurity
Collin	1,161	15.3%
Dallas	2,806	20.0%
Denton	2,768	15.8%
Fort Bend	197	14.9%
Grayson	142	18.2%
Harris	603	18.7%
Tarrant	1,915	18.0%
Wise	152	14.6%

Source: Fact Book 2015 and Feeding America 2014

Residence Hall Regulations: Cooking Policy Inconsistencies

According to the Texas Woman’s University Housing Campus Living Handbook: Department of University Housing revised 11-04-2014 posted on Texas Woman’s University’s website as of 8-29-2015

(http://www.twu.edu/downloads/housing/rlhandbook_updated_final_revised_11-04-2014.pdf):

Cooking is not permitted in resident rooms for health, safety, and sanitary reasons. This is a violation of fire codes. The only cooking appliances allowed in resident rooms are UL-approved coffee pots, popcorn poppers, and hot pots, all of which must be close coiled and which must be in excellent operating condition. The following cooking appliances are prohibited: open-faced electrical or heating appliances, such as hot plates, broilers, toasters, or ovens; microwave or toaster ovens; and electrical skillets, convection ovens, deep fryers, rice cookers, George Foreman grills, crock pots. Any of these appliances found during building

inspections will be placed in storage for the student until the end of the semester.

Cooking is only permitted in the specifically provided kitchen areas such as

apartment kitchens and common area kitchens properly equipped by the

University. On the Denton campus snack preparation kitchens are located in the

halls for residents to prepare snacks (those which can be prepared in 15 minutes

or less). Special arrangements can be made with the Hall/Residence Director or

Area Manager for those residents interested in preparing special meals (University

Housing 2014:47).

In contrast, the University Housing document titled *Move in 2014* posted on

Texas Woman's University website

(http://www.twu.edu/downloads/housing/Welcome_Packet_Fall_2014.pdf). Indicates that

students can prepare food in their rooms and that, if students would like to use the

common kitchen, that they must supply their own cooking vessels and utensils. Students

may only use approved appliances are not permitted: hot plates, broilers, toasters, deep

fryers, microwaves, rice cookers, George Forman grills, or crock pots/slow cookers

(University Housing 2014). Students who live in Guinn Hall, Jones Hall, and Stark Hall

are not permitted to have microwaves (University Housing 2014). Students who reside in

those halls have access to a common kitchen. However, students must supply all of their

own pots and utensils (University Housing 2014).

Inconsistency, Average Cost of Fast Food versus Buying a Meal Plan

The Campus Dining website contains a discussion board where administrators and students can make posts. Aramark posted a question on January 14 at 2:45 pm “Did you know? On average, eating fast food for three meals a day costs more than buying a meal plan.” In an effort to answer their question, I collected university meal plan documents and online menus from local fast-food establishments. At the time of Aramark’s post the university offered eight meal plans:

- University Plan that cost \$1620.00
- 12 Meal Plan that cost \$1555.00
- 10 Meal Plan that cost \$1490.00
- 8 Meal Plan Plus that cost \$1400.00
- 8 Meal Plan that cost \$1300.00
- Any 40 Plus that cost \$350.00
- Commuter 500 that cost \$500.00
- Commuter 300 that cost \$300.00

Aramark is the food service company that Texas Woman's University contracts with to provide food services on the Denton campus.



Figure 5.14 My \$15.08 Lunch

In Figure 5.14, I provide an example of the cost to purchase a snack and drink on campus. I visited the websites for three fast-food restaurants that are close to Texas Woman’s University, McDonalds, Jack in the Box, and KFC to approximate a daily food cost.

- McDonalds: Breakfast, sausage burrito \$1.19, hash brown \$1.00, sm. Coffee \$.90 = \$3.09. Lunch: McDouble \$1.39, fries \$1.29, sweet tea \$1.00, ice cream \$1.00 = \$4.68. Dinner: Mc Chicken \$1.00, side salad \$1.59, soda \$1.00, 3 cookies \$1.00 = \$4.59.
- Jack In the Box: Breakfast, jumbo platter with coffee \$4.49. Lunch: 2 tacos \$.99, value drink \$1.00, value fries \$1.00, mini cookies \$1.00 = \$3.99. Dinner: Jr. Jack \$1.39, value drink \$1.00, value fries \$1.00, chocolate cake \$1.79 = \$5.18.
- KFC Lunch and Dinner: 2 piece meal with drink \$7.35.

Table 5.4 summarizes the average daily cost for a campus meal plan and the average daily cost for purchasing food at local fast-food restaurants. The average was based on the calculation that three meals would be purchased per day (i.e., breakfast, lunch, dinner).

Table 5.4 Average Cost for Campus Meal Plan and Local Fast Food

University Meal Plan (3 meals a day)	Average cost per day		Average cost per day	Local Fast Food (3 meals a day)
12 Meal Plan Semester cost: \$1555.00 Average: \$7.25 per meal	\$21.75	VS	\$12.36	McDonalds
10 Meal Plan Semester cost: \$1490.00 Average \$8.60 per meal	\$25.80	VS	\$13.66	Jack in the box
8 Meal Plan Plus Semester cost: \$14000.00 Average \$9.17 per meal	\$27.51	VS	\$14.70	KFC
8 Meal Plan Semester cost: \$1300.00 Average \$9.58 per meal	\$28.74			

CHAPTER VI

DISCUSSION AND RECOMMENDATIONS

In this chapter, I first discuss the ways in which the findings presented in this thesis relate to the theory and literature discussed earlier. Next, I describe the significance of the findings to both the discipline of sociology and the case study location. Then, I conclude with recommendations and implications for future research.

As I mentioned in Chapter three, the perspectives of pragmatism and humanism guide this research. From these perspectives, findings and discussions should be presented in a practical way that can be applied in the real world (Savin-Baden and Major 2013).

Therefore, this discussion is organized by the themes that emerged during the analysis and interpretation process (Savin-Baden and Major (2013). The data collected during ethnographic fieldwork, implementation retail food establishment inventories, document analysis, and spatial analysis of the campus food environment data suggests three emerging themes:

1. There is a physical lack of access to food on campus.
2. Purchase of food both on and in proximity to campus is cost prohibitive for some students.
3. There is a significant lack of both healthy and culturally appropriate foods for students on campus and in proximity to campus.

As mentioned in chapter three, in addition to studying food insecurity, I work on and take classes on Texas Woman's University-Denton campus. As such, I was not surprised when the data from this project suggested limited physical access to affordable and culturally appropriate foods for students who reside in university housing. Lack of access to affordable food on university campuses is identified by numerous food insecurity researchers across the United States and Internationally (Chaparro et al. 2009; Gallegos et al., 2014; Hughes et al. 2011; Patton-Lopez et. al. 2014). Also, data from USDA's Food Desert Atlas (2015) found that TWU's Denton campus is located in a food desert. Food deserts are areas in which the community residents have limited physical and or economic to food access (Shaw 2006). This unfortunate finding has significance to the students and administrators of TWU as well as to the discipline of sociology.

SIGNIFICANCE TO THE DISCIPLINE OF SOCIOLOGY

From a sociological perspective, geographic-place is a key component of stratification and inequality (Lobao and Saenz 2002). Social science researchers could use the findings in this study to fill gaps in literature to advance their studies in the areas of stratification and inequality. Especially in the critical topic of food insecurity and access on university campuses, these findings illuminate the ways in which the social structure within this university-based case study can have unintended negative consequences on the student population. Additionally, the findings from this study help to fill methodological gaps in food access literature by moving beyond studies that report quantitative findings from survey research to exploring socio-spatial models of food

access. These methodological advances can help sociologists who study food access on campus, by using this case study as a framework to design future research.

SIGNIFICANCE TO CASE STUDY PARTICIPANTS

From a humanist perspective, all people should have access to food. As such, the findings of this study carry significant relevance to promote food justice for students who live in campus housing. Lack of physical access to food is identified the literature as a critical component of food insecurity (Bastian and Coveney 2013; French 2014). Food insecurity is defined as inconsistent access to adequate quantities of nutritional food due to limited financial resources (Coleman-Jensen et. al. 2013). Coupled with this, studies finding that 80 percent of Texas Woman's University students rely on financial aid due to insufficient resources is paramount, insufficient financial resources are a main contributor to food insecurity and to the lack of access to nutritionally adequate foods (Coleman-Jensen et. al. 2013).

First, the identification of insufficient resources coupled with the identification of limited physical access to affordable foods is a critical finding for the development and implementation of effective strategies to alleviate hunger. For example, while campus educational programs that focus healthy eating and budgeting are valuable, in this case they are insufficient strategies in and of themselves to alleviate hunger for Denton students. Because data suggests, in this case, that the Denton campus students lack financial resources and are highly dependent on financial aid. Therefore, student awareness initiatives might be more successful when focused on ways students can increase funding sources such as grants, scholarships, campus employment and food

access such as applying for federal nutrition benefits, locating emergency food in the community, and offering affordable nutritious seven-day meal plan on campus. More importantly, now that this issue has been identified by methodologically sound research, researchers, anti-hunger activists, administrators, and students have empirically-based evidence from which to draw to advocate for improved access to economical food on campus.

Gallegos et al. (2014) reported that student food insecurity can have long-term consequences such as adverse health and educational outcomes. Therefore, prevalence and determinants of student food insecurity need to be identified. This information can serve as an empirically based foundation upon which innovative programs (i.e., student resource awareness; healthy eating with limited resources; pooled transportation; and food utilization preparation and storage classes) to alleviate food insecurity can be created (Jessri et al. 2014). For example, an informal survey conducted at San Diego City College revealed that students were aware of local food banks; however, they lacked access to transportation, essentially trapping them on campus for extended periods of time with little or nothing to eat (Robbins 2010). This information led to the creation of a campus free lunch program (Robbins 2010). Additionally, this information can be used by activists and university administrators to lobby and advocate for increased funding to improve student's access to healthy, affordable food (Jessri et al. 2014). University sponsored hunger initiatives impact the academic community on multiple levels to alleviate hunger while simultaneously improving retention rates and timely graduation rates (Meldrum and Willows 2006).

RECOMMENDATIONS

Place-Based Policy Recommendations

Due to the current infrastructural space limitations and the extended time frame (four years, 2019) until the new Student Union will be completed, I recommend re-examining the structure and costs of campus meal plans. In particular, the university should consider offering a meal plan that allows students to purchase three meals a day, seven days a week. My second recommendation is to consider allowing students with meal plan money remaining at the end of the semester to donate the dining dollars to an “emergency account” for food insecure students. My final recommendation would be to form a food security council on campus to examine possible strategies to improve access to food.

University Based Hunger Initiatives

What do other universities do when they identify a hungry student population on their campus (Cruz 2014)? According to the Michigan State Food Bank [a founding member of the College and University Food Bank Alliance], the number of campus based food pantries has risen from four in 2008 to over 121 as of 2015 (DeChellis 2014). Campus-based food banks should be viewed not only as a resource for students in need, but also as an active-learning opportunity to get other students involved in this issue (DeChellis 2014). Texas Woman’s University-Denton campus has several departments that could benefit from service learning activities in conjunctions with a food pantry: Department of Nutrition, Department of Sociology and Social Work, and the Department of Nursing just to name a few. Huffman (2014) notes that some universities and colleges

address this issue with campus food pantries, educational programs, and guides like the University of Michigan Health System *Guide for Healthy Eating on a Budget*. Robbins (2010) reported on college and university campus programs responding to the problem of food insecurity with a free lunch bag program for San Diego City College students.

The neighboring university in Denton, The University of North Texas, opened a food pantry on campus in an effort to prevent the University of North Texas students from experiencing food insecurity and hunger after a campus-wide survey revealed food insecurity on that campus (Toledo 2015). According to a recent article in the North Texas Daily, “The pantry was created by Fritts and Associate Dean of Students, Rodney Mitchell, to combat food insecurity suffered by thousands of college students in the U.S. as costs of living and education go up.” Joseph Nunez, a freshman said, “It’s really thoughtful. I think it’ll definitely help toward the end of the semester when parents aren’t as financially supportive” (Toledo 2015).

Local, State, and Federal Hunger Initiatives

In the United States, safety-net programs focus on helping Americans living in poverty (i.e., Women, Infants, and Children [WIC]; Supplemental Nutrition Assistance Program [SNAP], formerly food stamps; School Breakfast and Lunch Programs. Even with these programs in place, one in four income-eligible individuals do not apply for federal nutrition assistance programs (Aleccia 2013). Researchers attribute the lack of participation in part to psychological barriers (i.e., stigma and shame) of “taking a hand-out” (Aleccia 2013). Aleccia (2013:2) interviewed Colleen Flaherty Manchester, assistant professor of management at the University of Minnesota, who said, “I think it has to do

with feelings of reduced self-efficacy, reduced self-esteem, and psychological pressure from going against the social norm.” Additionally, according to the USDA, “traditional” full-time students generally do not qualify for supplemental nutrition assistance programs unless they have extenuating circumstances (i.e., support of a child under 12, or working at least 20 hours per week) (DeChellis 2014). Demographic data revealed in this case study suggest that the non-traditional nature of this mostly female student body might benefit from a resource person that could help connect students to federal and local nutritional benefits programs such as SNAP, WIC, or local food pantries.

IMPLICATIONS FOR FUTURE RESEARCH

Referring back to Chapter 5, findings from the ethnographic field observations, and document review points to three themes for future research:

- (1) Economic aspects of access to food on campus such as, low-pay, high cost of tuition, high cost of meal plans, and high cost of food sold on campus.
- (2) Physical access to food on campus such as limited hours of dining options, location of dining options, quality and limited selection (healthy, vegetarian, gluten free), limited access to culturally/ethnically acceptable foods.
- (3) Lack of access to food utilization tools on campus, such as housing cooking policies, tiny dorm refrigerator, and tiny areas for food storage.

In sum, future campus food access research would benefit from adding an interview component to talk to administrators to see the rationale behind certain policies and procedures. It would also benefit from administering food-security surveys and conducting interviews with students who live in campus housing to hear their perspectives on the issue of food access.

CONCLUSION

In conclusion, a mixed-methods approach that includes ethnographic, spatial, the *Campus Food Environment Measure Inventory*, and document analysis can provide a practical and methodological sound assessment of campus food environments. The multidimensional instrument tested in this case study provides support for future research in identifying structural barriers that can be modified within the environment to help increase student food access. Also, importantly, data collected in this case study can be used to affect local policy and to support campus-based initiatives to alleviate hunger in the swamp at Texas Woman's University-Denton campus.

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APPENDIX A
DEFINITIONS OF FOOD ESTABLISHMENTS

Definitions and Classifications of Types of Food Establishments

A ‘food establishment’ for the purpose of this thesis is defined as “A food establishment is an operation that (1) stores, prepares, packages, serves, vends, or otherwise provides food for human consumption, including a restaurant, satellite or catered feeding location, market, grocery store, convenience store, special event food stand, school, boarding establishment, vending machine and vending location, institution, and retail bakery; or (2) relinquishes possession of food to a consumer directly or indirectly through a delivery service, including the home delivery of grocery orders or restaurant takeout orders, and a delivery service that is provided by common carriers” (Minneapolis Health Department 2015).

STORES

Supermarkets and Other Grocery (except Convenience) Stores (CODE: GROCERY)

“This industry comprises establishments generally known as supermarkets and grocery stores primarily engaged in retailing a general line of food, such as canned and frozen foods; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry.

Included in this industry are delicatessen-type establishments primarily engaged in retailing a general line of food.” (U.S. Census Bureau 2012).

Convenience Stores (CODE:CONVENIENCE): “This industry comprises establishments known as convenience stores or food marts (except those with fuel pumps) primarily engaged in retailing a limited line of goods that generally includes milk, bread, soda, and snacks.” (U.S. Census Bureau 2012).

Mobile Food Services 722330: “This industry comprises establishments primarily engaged in preparing and serving meals and snacks for immediate consumption from motorized vehicles or non-motorized carts. The establishment is the central location from which the caterer route is serviced, not each vehicle or cart. Included in this industry are establishments primarily engaged in providing food services from vehicles, such as hot dog carts and ice cream trucks.” (U.S. Census Bureau 2012).

Meat Markets 445210: “This industry comprises establishments primarily engaged in retailing fresh, frozen, or cured meats and poultry. Delicatessen-type establishments primarily engaged in retailing fresh meat are included in this industry.” (U.S. Census Bureau 2012).

Pharmacies (CODE: DRUGSTORE)

Restaurant: “Defined as retail locations that prepare and serve food for immediate consumption” (Minaker 2009).

Full-Service Restaurants (CODE:RESTFULL) “This U.S. industry comprises establishments primarily engaged in providing food services to patrons who order and are served while seated (i.e., waiter/waitress service) and pay after eating. These establishments may provide this type of food service to patrons in combination with selling alcoholic beverages, providing carryout services, or presenting live nontheatrical entertainment.” (U.S. Census Bureau 2012).

Limited-Service Restaurants (CODE:RESTLIM): “This U.S. industry comprises establishments primarily engaged in providing food services (except snack and nonalcoholic beverage bars) where patrons generally order or select items and pay before

eating. Food and drink may be consumed on premises, taken out, or delivered to the customer's location. Some establishments in this industry may provide these food services in combination with selling alcoholic beverages” (U.S. Census Bureau 2012).

Cafeterias, Grill Buffets, and Buffets (CODE:CAFATERIA) “This U.S. industry comprises establishments, known as cafeterias, grill buffets, or buffets, primarily engaged in preparing and serving meals for immediate consumption using cafeteria-style or buffet serving equipment, such as steam tables, refrigerated areas, display grills, and self-service nonalcoholic beverage dispensing equipment. Patrons select from food and drink items on display in a continuous cafeteria line or from buffet stations” (U.S. Census Bureau 2012).

Snack and Nonalcoholic Beverage Bars (CODE: SNACKBAR): “This U.S. industry comprises establishments primarily engaged in (1) preparing and/or serving a specialty snack, such as ice cream, frozen yogurt, cookies, or popcorn or (2) serving nonalcoholic beverages, such as coffee, juices, or sodas for consumption on or near the premises. These establishments may carry and sell a combination of snack, nonalcoholic beverage, and other related products (e.g., coffee beans, mugs, coffee makers) but generally promote and sell a unique snack or nonalcoholic beverage” (U.S. Census Bureau 2012).

Vending Machines: (CODE: VENDING) An electronic machine that dispenses a product to a consumer after money has been put into the machine to pay for the product. Products typically include cooled beverages and snacks (Business Dictionary 2015)

APPENDIX B
CAMPUS FOOD ENVIRONMENT MEASURE-VENDING INVENTORY

Campus Food Environment Measure-Vending Inventory Version 1.0

Date: ____ / ____ / ____ month / day / year		Start Time: ____:____ <input type="checkbox"/> am <input type="checkbox"/> pm		Researcher:	
ID #		VENDING LOCATION INFORMATION			
01		Building Name:		Room Number:	
02		Building Address:			
03		Building GPS Coordinates: DMS: latitude: longitude:			
04		Describe the vending location:			
05		<p>Building Hours of Operation: <input type="checkbox"/> Hours of building access not posted.</p> <p><input type="checkbox"/> Building is open 24 hours (if open 24 hours, leave daily hours of operation blank.)</p> <p><input type="checkbox"/>1Monday: Opening Time:_____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p><input type="checkbox"/>2Tuesday: Opening Time:_____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p><input type="checkbox"/>3Wednesday: Opening Time:_____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p><input type="checkbox"/>4Thursday: Opening Time:_____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p><input type="checkbox"/>5Friday: Opening Time:_____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p><input type="checkbox"/>6Saturday: Opening Time:_____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p><input type="checkbox"/>7Sunday: Opening Time:_____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p>			

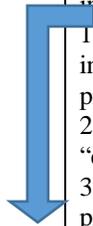
Building _____ Room number _____ Machine _____ of _____		
	Question	Response Options
06	How many 'vending areas' are located in this building?	<input type="checkbox"/> 1 1 vending area <input type="checkbox"/> 2 2 vending areas <input type="checkbox"/> 3 3 vending areas <input type="checkbox"/> 4 Other-specify
07	How many machines are located in this 'vending area'?	<input type="checkbox"/> 1 1 vending machine <input type="checkbox"/> 2 2 vending machines <input type="checkbox"/> 3 3 vending machines <input type="checkbox"/> 4 Other-specify
<p>NOTE: Complete a "Vending Location Information" page for each vending area within a building. Complete the two page "Individual Vending Machine Inventory" for each vending machine.</p>		
INDIVIDUAL VENDING MACHINE INVENTORY		
	Question	Response Options
08	Is this machine located in a public area?	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No
09	Select the type of vending machine. (Select only one response)	<input type="checkbox"/> 1 Food Only <input type="checkbox"/> 2 Beverage Only <input type="checkbox"/> 3 Food and Beverage <input type="checkbox"/> 4 Other
10	What types of payment methods does the machine accept? (Select all that apply)	<input type="checkbox"/> 1 Credit/Debit <input type="checkbox"/> 2 \$1.00 Bill <input type="checkbox"/> 3 Change <input type="checkbox"/> 4 Other
11	Does the machine display sign, sticker, or messages that promote healthy food choices? If yes, describe.	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No
12	Are specific products in the machine identified as healthy choices? If yes, describe.	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No

Building _____ Room number _____ Machine _____ of _____

VENDING MACHINE INVENTORY DIAGRAM

13

This diagram should reflect the available vending spaces in the machine that you are inventorying.



1. Starting with the first box in the upper left corner of the diagram, write an “X” in each box to indicate that the vending space does not exist. The remaining boxes should represent the same product/vending selection spaces as the machine you are inventorying.
2. Write an “E” in any of the diagram boxes to notate vending availability but that the space is “empty” (i.e. no product is available for sale in that allotted space).
3. For each vending product space, write the products name, size in ounces, and the cost of product. (If visible)

APPENDIX C

CAMPUS FOOD ENVIRONMENT: RESTAURANT INVENTORY

CAMPUS FOOD ENVIRONMENT: RESTAURANT INVENTORY

Date: ___/___/___		Start Time: ___:___ <input type="checkbox"/> am <input type="checkbox"/> pm	Researcher:
ID #	RESTAURANT INFORMATION		
01	Restaurant Name:		
02	Restaurant Address:		
03	GPS Coordinates DMS: latitude: longitude:		
DESCRIPTION OF WALKING ROUTE TO RESTAURANT			
	Question	Response Options	
04	Which university residence were you located at when you began walking to this restaurant?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	
05	Which street(s) did you walk on to get to this restaurant?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	
06	Did you see speed limit signs posted on the streets you listed in 4? If YES What were the posted limits for the street(s)?	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	

Restaurant _____		Page _____ of _____
07	<p>Did you cross any intersections?</p> <p>If YES Which intersection(s) did you cross?</p>	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
08	<p>Potential Access to Restaurant -Hours of Operation:</p> <p><input type="checkbox"/> Hours of operation not listed</p> <p><input type="checkbox"/> Open 24 hours (if open 24 hours, leave daily hours of operation blank.)</p> <p>Monday: Opening Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p>Tuesday: Opening Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p>Wednesday: Opening Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p>Thursday: Opening Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p>Friday: Opening Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p>Saturday: Opening Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p> <p>Sunday: Opening Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm Closing Time: _____ <input type="checkbox"/>am <input type="checkbox"/>pm</p>	
	Question	Response Options
09	<p>Select type of restaurant: (<i>Select one</i>)</p>	<input type="checkbox"/> 1 Full Service <input type="checkbox"/> 2 Limited Service <input type="checkbox"/> 3 Cafeteria/Buffer <input type="checkbox"/> 4 Snack/Beverage Bar <input type="checkbox"/> 5 Other

APPENDIX D

CAMPUS FOOD ENVIRONMENT MEASURE: STORE INVENTORY

CAMPUS FOOD ENVIRONMENT MEASURE: STORE INVENTORY

Date: ___/___/___		Start Time: ___:___ <input type="checkbox"/> am <input type="checkbox"/> pm	Researcher:
ID #	STORE INFORMATION		
01	Store Name:		
02	Store Address:		
03	GPS Coordinates DMS: latitude: longitude:		
DESCRIPTION OF WALKING ROUTE TO STORE			
	Question	Response Options	
04	Which university residence were you located at when you began walking to this store?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	
05	Which street(s) did you walk on to get to this store?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	
06	Did you see speed limit signs posted on the streets you listed in 4b? If YES What were the posted limits for the street(s)?	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	

Store _____		Page _____ of _____
07	<p>Did you cross any intersections?</p> <p>If YES Which intersection(s) did you cross?</p>	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
08	<p>Potential Access to Store-Hours of Operation:</p> <p><input type="checkbox"/> Hours of operation not listed</p> <p><input type="checkbox"/> Open 24 hours (if open 24 hours, leave daily hours of operation blank.)</p> <p>Monday: Opening Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm Closing Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm</p> <p>Tuesday: Opening Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm Closing Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm</p> <p>Wednesday: Opening Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm Closing Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm</p> <p>Thursday: Opening Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm Closing Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm</p> <p>Friday: Opening Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm Closing Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm</p> <p>Saturday: Opening Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm Closing Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm</p> <p>Sunday: Opening Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm Closing Time: _____ <input type="checkbox"/> am <input type="checkbox"/> pm</p>	
	Question	Response Options
09	Select type of store	<input type="checkbox"/> 1 Supermarket <input type="checkbox"/> 2 Convenience <input type="checkbox"/> 3 Pharmacy <input type="checkbox"/> 4 Grocery Specialty <input type="checkbox"/> 5 Other

Store _____		Page _____ of _____	
10	Does the store accept any of the following payment methods? (Mark all that apply)	<input type="checkbox"/> 1 Credit/Debit <input type="checkbox"/> 2 Cash <input type="checkbox"/> 3 SNAP <input type="checkbox"/> 4 Other	
11	What ONE odor is most noticeable?	<input type="checkbox"/> 1 Rotten/unclean smell <input type="checkbox"/> 2 Cooked foods <input type="checkbox"/> 3 Cleaning Product/Antiseptic <input type="checkbox"/> 4 No odor <input type="checkbox"/> 5 Other	
12	What is your impression of the cleanliness of the store?	<input type="checkbox"/> 1 Very dirty <input type="checkbox"/> 2 Somewhat dirty <input type="checkbox"/> 3 Not very dirty <input type="checkbox"/> 4 Somewhat clean <input type="checkbox"/> 5 Very clean	
AVAILABILITY OF PRODUCTS			
	Item	Availability	Comments
13	Fresh Fruit	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
14	Packaged/Can Fruit	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
15	Fresh Vegetables	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
16	Packaged/Can Vegetables	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
17	Ready to eat Meals	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
18	Heat then eat meals	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
19	Soda, 20 oz.	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
20	Diet Soda, 20 oz.	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
21	Water, 20 oz.	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
22	Tea, 20 oz.	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	
23	Is organic produce sold?	<input type="checkbox"/> 1 Yes <input type="checkbox"/> 0 No	

APPENDIX E:
CAMPUS FOOD ENVIRONMENT MEASURE: PEDESTRIAN OBSERVATION
TOOL

Campus Food Environment Measure-Pedestrian Observation Tool (CFEM-POT)

Date: _____ Time: _____ Weather: _____ Location: _____

Physical characteristics of streets and sidewalks:

Space between vehicles and walkers 'grass buffer':

Signals at cross walks:

Number of intersections:

Number of lanes in road:

Location _____ Page _____ of _____

Curb cuts:

Building distances from sidewalk:

Street lights:

Trees for shade:

Weather/climate

Location _____ Page _____ of _____

Sidewalk/walkway slope

Traffic volume

Sense of security:

Attractiveness architecture & landscaping:

Odor:

Location _____ Page _____ of _____

Noise:

Speed limits:

APPENDIX F:
IRB APPROVAL LETTER



Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378
email: IRB@twu.edu
<http://www.twu.edu/irb.html>

DATE: July 30, 2015

TO: Ms. Allison Ray
Sociology & Social Work

FROM: Institutional Review Board - Denton

Re: Exemption for Food Access on Campus: A Place Based Socio-Spatial Method to Measure Structural Barriers within the Campus Food Environment (Protocol #: 18436)

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. Because a signed consent form is not required for exempt studies, the filing of signatures of participants with the TWU IRB is not necessary.

Although your protocol has been exempted from further IRB review and your protocol file has been closed, any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All forms are located on the IRB website. If you have any questions, please contact the TWU IRB.

cc. Dr. Celia Lo, Sociology & Social Work
Dr. Jessica Smartt Gullion, Sociology & Social Work
Graduate School