

# Personal food environments: Perceptions of retail affordability and accessibility among mothers in Saskatoon, Canada

A Thesis Submitted to the College of Graduate and Postdoctoral Studies and  
Research in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy in the  
Department of Community Health and Epidemiology  
College of Medicine  
University of Saskatchewan  
Saskatoon, Saskatchewan, Canada

By:  
Sugandhi del Canto

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Dean  
College of Graduate and Postdoctoral Studies  
University of Saskatchewan  
116 Thorvaldson Building, 110 Science Place  
Saskatoon, Saskatchewan, S7N 5C9  
Canada

Head of the Department of Community Health and Epidemiology, College of Medicine  
104 Clinic Place  
University of Saskatchewan  
Saskatoon, Saskatchewan, S7N 2Z4, Canada

## Abstract

The intersection of built food environments, foodwork and motherhood is an opportunity to examine healthy food access from the perspective of an important food-purchasing population. The personal food environment represents a geosocial constellation of places and spaces where people access, acquire, consume and dispose of food. In this study, a combination of objective and perceptual assessments was used to uncover experiences of affordability and accessibility within Saskatoon, Saskatchewan's retail food environment. Using a phased, explanatory mixed methods design, 60 residential neighbourhoods were stratified by socioeconomic status (SES) and built food environment attributes. An in-store survey was used to measure the overall 'healthiness' of 24 supermarkets and 92 convenience stores (n=116 food stores), and data was further parsed out to assess the price and availability of 32 fruit and vegetable items in supermarkets. Spatial data was used to characterize food store density and distribution at the neighbourhood level. In the second, qualitative phase of the study, three nested interview approaches were used to uncover perceptions of affordability and accessibility, and to create narratives of personal food environments. Participants were recruited from families who had participated in the *Smart Cities, Healthy Kids* (SCHK) study led by the Saskatchewan Population Health and Evaluation Research Unit at the University of Saskatchewan. Using in-store survey and neighbourhood census findings from the quantitative phase, a qualitative sampling frame was developed to find maximum variation of built FE attributes. This frame guided participant sampling for the subsequent qualitative phase of sit-down interviews (n=27), photovoice interviews (n=7) and go-along interviews (n=3). The latter interview approach is an in-situ inquiry method that relied on experiential prompts to elicit an understanding of perceptions of affordability and accessibility among participants.

In the first phase, no discernable quantitative differences were found in the overall price or availability of healthy foods offered in supermarkets across Saskatoon. However, a slight difference in the price of fruits of vegetables between high and low SES neighbourhoods suggests that residents in the latter may be paying more. Low SES neighbourhoods had nearly twice the density of convenience stores than high or mid SES neighbourhoods, which is troubling when considered in tandem with the absence of supermarkets in those same neighbourhoods. Content analysis was used to organize the stores named by participants into

*main, preferred* and *avoided* to uncover perceptions of positive and negative store attributes. Iterative Categorization was used to thematically analyze aspects of foodwork that influenced perceptions of the retail food environment. Interviews uncovered themes of convenience and comfort that underscore the relational nature of personal food environments. Participants sought convenience by evaluating distance in terms of drivability between spaces of prescription and spaces of negotiation, with the latter representing the dynamic demands of foodwork decision-making of where to shop and when. They sought comfort in food outlets with positive attributes that were based on their perceptions of affordability and accessibility. They developed strategies to alleviate stresses associated with foodwork, such as negotiating with picky eaters or sourcing quick, healthy meals to provide to their children in-between afterschool activities. Narratives of routines of practice, developed from go-along interview data, were supplemented with photovoice data to create detailed descriptions of three personal food environments.

The findings of this study reinforce the importance of integrating perceptions and experiences into research that informs policy development or implementation science aimed at improving nutrition-related outcomes.

## Acknowledgements

Thank you to the many people who travelled this long journey with me. Much gratitude to my supervisor, Dr. Rachel Engler-Stringer, who guided and encouraged me through this process. Thank you to the members of my committee – Drs. Sylvia Abonyi, Nazeem Muhajarine, Scott Bell, and Bonnie Janzen - for their invaluable insights into this research. Thank you to my grad student support family: Jenn Waygood, Donelda Gowan, Ha Le, Farzana Ali, Lise Kossick-Kouri, and Farha Aktar. Thank you to Tracy Ridalls for leading the SCHK team and her invaluable contributions to my study, as well as Joel Heitmar for being a great colleague on this project.

I am grateful to my parents, Jaliya and Marianne; my brother, Tilan; and my extended international family, all of whom have been supportive and enthusiastic about my education from the very beginning. My in-laws, Edison, Cristina and Emil, have been a strong source of support and incredibly kind since I've moved to Saskatoon. I am thankful for my friends who've cheered me on all these years when I was certain I would give up: Chi, Lara, Heather Ann, Laura, Beatrice, Vero, Cristobal, Stu, Amanda, Jadie, Alanna, Sarah and Michael.

I am indebted to the work of the City Centre Food Co-op, helping me to grow as an evidence-based activist. I have sincerely appreciated the opportunity to put my doctoral research to immediate use, and I am proud of our co-op's collaborative work to improve food security in Saskatoon.

Finally, infinite is my gratitude for my husband, Yvo, who has travelled this long journey with me with both patience and pride. Thank you.

## Dedication

To Gran and Aunty Tina, for all the times they smiled and said, “Well done, clever girl.”

## Table of Contents

Abstract.....	ii
Acknowledgements.....	iv
Dedication.....	v
List of Tables.....	viii
List of Figures.....	x
List of terms used.....	xi
Chapter 1: Introduction.....	1
1.1 Background.....	1
1.2 Objective.....	2
1.3 Study design.....	3
1.4 How this dissertation is organized.....	3
Chapter 2: Literature Review.....	5
2.1 Background.....	5
2.2 Built food environments.....	6
2.3 Nutrition and health.....	6
2.2.1 Measuring the built food environment.....	8
2.2.2 Geographic measures.....	9
2.2.3 Spatial descriptions.....	10
2.3 Food systems and food shopping.....	11
2.4 Canadian food environments.....	11
2.5 Saskatoon’s built environments.....	13
2.5.1 Saskatoon’s built food environments.....	14
2.5.2 Smart Cities, Healthy Kids.....	15
2.6 Foodwork as motherhood.....	15
2.7 Activity space as built food environments.....	17
2.8 Personal food environments.....	18
2.9 Assessments of food environment perceptions.....	19
2.9.1 Quantitative assessments of the built FE.....	20
2.9.2 Qualitative assessments of the personal FE.....	20
2.9.3 Mixed methodology in FE research.....	22
Chapter 3: Research Methods.....	24
3.1 Background.....	24
3.2 Study objectives.....	24

3.3 Research Questions .....	25
3.3.1 Phase 1: Quantitative .....	25
3.3.2 Phase 2: Qualitative .....	25
3.5 Study design: mixed methods notation .....	26
Figure 3.1: quan → QUAL study design.....	27
3.4 Theoretical Framing.....	27
3.4.1 Theoretical influences .....	28
3.6 Study setting: Saskatoon, SK.....	29
3.7 Quantitative data collection .....	29
3.7.1 NEMS-S In-store survey.....	29
3.7.2 Developing the qualitative sampling frame .....	31
3.8 Qualitative data collection .....	32
3.8.1 Sit down interviews.....	32
3.8.3 In-situ, go-along interviews .....	35
3.9 Summary of data sources .....	36
3.10 Managing data from multiple sources.....	40
3.11 Quantitative analysis.....	41
3.12 Qualitative analysis: nested interviews .....	42
3.13 Ensuring Study Rigour.....	42
3.14 Ethics approval.....	43
Chapter 4: Results and Findings .....	45
4.1 Background.....	45
4.2 Geographic characterization of the retail FE .....	46
4.2.1 Community food environment results.....	46
4.2.1 Consumer food environment results .....	47
4.3 Perceptions of the retail food environment .....	49
4.3.1 Changes to Saskatoon’s retail landscape.....	50
4.3.2 Sit-Down Interviews (n=27) .....	50
4.3.3 Photovoice interviews (n=7) .....	65
4.3.4 Go-along interviews (n=3).....	69
4.3.4.1 Caroline.....	72
4.3.5 Personal food environments: Routines of practice.....	87
4.4 Quantitative and qualitative findings: Answering the research questions .....	89
4.4.1 What is the relationship between in-store measures of price and availability of fruits and vegetables, and select socioeconomic status (SES) at the neighbourhood-level?.....	89



4.4.2 Among mothers in Saskatoon, what are their perceptions of price and availability of fruits and vegetables within their personal FE? .....	90
Chapter 5: Discussion and Conclusion .....	93
5.1 Assessments of availability .....	93
5.2 Assessments of affordability .....	98
5.3 Interview themes: Convenience and Comfort.....	99
5.3.1 Perceptions of convenience.....	101
5.3.2 Perceptions of Comfort .....	103
5.4 Narratives of personal food environments .....	104
5.5 Changes to the field of FE research .....	106
5.5.1 Changes to food environment assumptions.....	107
5.5.2 Model of Community Nutrition Environments.....	109
5.6 Strengths .....	110
5.7 Limitations .....	111
5.7.1 Biases .....	113
5.8 Summary .....	114
5.9 Conclusion .....	115
Appendices.....	117
Appendix A: Neighbourhood Rankings and Mean NEMS-S Scores.....	118
Appendix B: Recruitment letter for sit-down interviews.....	121
Appendix C: NEMS-S scoring.....	124
Appendix D: Letter for food store managers .....	127
Appendix E: Sit-down interview guide.....	128
Appendix F: Photo-Voice Interview Guide .....	131
References.....	133

## List of Tables

Table 3.1	Quantitative and qualitative data sources.....	36
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Table 3.2 Store type classification.....41

Table 4.1 Distribution of supermarkets and convenience stores.....47

Table 4.2 Produce price and availability.....48

Table 4.3 Produce access in supermarkets.....48

Table 4.4 Participants' shopping and cooking foodwork.....70

## List of Figures

Figure 2.1	Model of Community Nutrition Environments.....	9
Figure 2.2	Saskatoon neighbourhood planning eras.....	14
Figure 3.1	quan → QUAL study design.....	28
Figure 4.1	Snowy weather makes it hard to eat healthy.....	66
Figure 4.2	Busy schedules make it hard to eat healthy.....	67
Figure 4.3	Constant price monitoring is required to eat healthy.....	68
Figure 4.4	Snow makes it hard to shop for food.....	74
Figure 4.5	Picky eaters make it hard to eat healthy.....	75
Figure 4.6	Sarah sometimes walks to a grocery store when walking her dog.....	78
Figure 4.7	Paige planned her shopping around sales and special offers.....	82

## List of terms used

### **Activity space**

The spatial movement component of an individual's day-to-day lived experience, used often to describe the spaces and places a person visits on a regular basis (McEntee & Agyeman, 2010).

### **Built environment**

The physical design, land use patterns (residential, commercial, office, industrial and other activities) and transportation systems in a defined area (Hill, Wyatt, Reed, & Peters, 2012).

### **Community Nutrition Environments Model**

One of the most widely used models in food environment research to make evident the interconnected dimensions of policy, environmental and individual variables that influence nutrition. In this model, the relationship between food and health outcomes is conceptualized as four different types of environmental variables that are influenced by policy, and that these environmental variables, in turn, influence individual eating behaviours through the Perceived Nutrition Environment (Green & Glanz, 2015). The four environmental variables are organizational (home, work, school or other locations), information (media and advertising), community (the choices available between food stores) and consumer (the choices available inside a food store) (Glanz, Sallis, Saelens, & Frank, 2005).

### **Constructivism**

An epistemology that contends that reality can only be grasped in the form of multiple subjective constructions. These constructions are social and experiential, local and specific, and dependent on the individuals' meaning of these constructions (Carpiano & Daley, 2006).

Constructivism emphasizes peoples' relationships and social-symbolic systems, positing that people make new meanings as these relationships and systems develop (Mahoney & Granvold, 2005).

**Convenience store**

In this study, a convenience store was any kind of the following: stores attached to gas stations, free-standing chain or independent stores selling convenience food, and big box stores whose primary offering wasn't food.

**Ecological fallacy**

The frequently false assumption that trends at a population- or environmental-level are also true at the individual level (Last, 1988).

**Food desert**

A metaphor used to describe geographic areas where affordable and nutritious foods are unavailable, requiring residents to travel outside of their neighbourhood to access them (Wrigley, 2002).

**Food environment (FE)**

Any opportunity to obtain food. This can include physical, socio-cultural, economic and policy factors at both micro- and macro-levels. FEs include the accessibility and availability to food as well as marketing and advertising of food and food products (Glanz, Sallis, Saelens, & Frank, 2007).

**Food mirage**

Geographic areas with food stores but, because high of higher prices or discomfort within those spaces, healthy foods are economically inaccessible for local households (Breyer & Voss-Andreae, 2013).

**Food swamp**

Areas with high geographic access to non-nutritious foods (Spence, Cutumisu, Edwards, Raine, & Smoyer-Tomic, 2009).

## **Foodwork**

A term coined by Wright et al to describe key food activities and exchanges between mothers and children which, at the time, was contextualized within the childhood obesity focus of FE research. Foodwork includes planning, purchasing preparation, eating and the emotional and domestic management of children's eating (Wright, Maher, & Tanner, 2015).

## **Geographic Information Systems (GIS)**

A set of tools that capture, store, analyze, manage, and present data that are linked to locations (ESRI, n.d.).

## **Material and Social Deprivation Index**

Developed by Quebec's Ministry of Health and commonly used in place-based health research in Canada to categorize socioeconomic indicators (Pampalon et al., 2009).

## **Obesogenic environments**

Sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations (Feng, Glass, Curriero, Stewart, & Schwartz, 2010)

## **Personal food environment (FE)**

The subset of places that an individual has chosen from among all the places accessible to them in the built FE, and is best described through personal meanings of time, space and place (Desjardins, 2010). The personal FE is the focus of this dissertation.

## **Post-positivism**

An epistemic construction that attempts to address some critiques of positivism. Reality is assumed to exist, but, in contrast with positivist assumptions, it is only imperfectly understood. Although objectivity may not be possible, it remains as a 'regulatory ideal.' Research entails making claims and then refining or abandoning some of them (via the use of quantitative and qualitative methods) for more strongly warranted claims. Findings are contextually bound and thus cannot be generalized. Because evidence is always imperfect and fallible, researchers do not

verify a hypothesis (as in positivism), but rather indicate a failure to reject one (Carpiano & Daley, 2006).

### **Socio-economic status (SES)**

Used in this dissertation as a categorization into high, middle and low tertiles of the six indicators of the Material-Social Deprivation Index. SES is used in this study to give the reader a sense of neighbourhood-level comparability (Pampalon et al., 2009).

### **Supermarket**

Stores whose primary offering is food, and are part of a larger chain of stores, sometimes known as “banners.”

# Chapter 1: Introduction

*Human agency, they say, is inherently spatial, and is central in creating meaning of place* (Desjardins, 2010, p. 19).

## 1.1 Background

The intersection of built food environments, foodwork and motherhood is an opportunity to examine perceptions of affordability and accessibility from the perspective of a key food-purchasing population (Brady, Parker, Belyea, & Power, 2018). This study examines mothers' perceptions of their personal food environment (FE) through the collection and analysis of qualitative and quantitative data. Using a sequential, explanatory mixed methods design, this study uses six sources of data to crystalize narratives of personal FEs. In this dissertation, a personal FE is operationalized as a geosocial constellation of places and spaces where people access, acquire, consume and dispose of food.

The built environment represents the physical spaces and structures that people make to live, work, and play (Townshend & Lake, 2009). The built FE is made up of familiar structures like supermarkets, convenience stores, fast food outlets, and restaurants, but also includes home, work, and school environments. Broader dimensions of the FE include marketing, government regulation, and corporate decisions. Accordingly, the personal FE is an individual's highly idiosyncratic subset of places that they have chosen from among all the places accessible to them (Desjardins, 2010). These spaces are sites of foodwork.

The term *foodwork* has been used in the work of feminist FE scholars such as Wright, Parsons and Fielding-Singh to describe the visible and invisible efforts of mothers to provide food for their family (Fielding-Singh, 2017a; Parsons, 2016; Wright et al., 2015). In this dissertation, foodwork is used to describe the spectrum of labour required to provide food: planning, shopping, learning, cooking, storing, and safely disposing. While the context of foodwork in this dissertation focuses on mothers, the term is applied broadly to anyone who performs labour within the foodwork spectrum.

In the majority of households globally, women – especially mothers – are expected to act as the nutritional guardians of the family and to perform the majority of foodwork. It is



important, then, to examine their specific experiences when trying to understand impacts of the built FE on equitable food access. As men become more involved in food shopping and cooking, the research focused on men's foodwork is growing. In two-parent households, even when fathers are involved in foodwork, much of the research shows the persistence of gendered roles, wherein women still perform the majority of foodwork (Fielding-Singh, 2017b).

Saskatoon, Saskatchewan is a mid-sized city in the Canadian Prairies. Previous research in Saskatoon found significant health disparities at the neighbourhood level, indicating spatial patterns of inequity (Lemstra & Neudorf, 2008). Further research found evidence of food deserts across the city, which are defined as areas lacking supermarkets or grocery stores, (Kershaw, Creighton, Markham, & Marko, 2010). The absence of supermarkets in most neighbourhoods, when combined with the neighbourhood-level health disparities clustered across the city, indicate that place-based health research, such as examinations of retail FEs, can contextualize the nutritional realities of Saskatoon residents.

## 1.2 Objective

The overall objective of this study was to gain a population-specific understanding of the retail FE using a mixed methods research design. This study examined built FE experiences from the perspective of mothers of adolescent children; specifically, this study examined their perceptions of affordability and accessibility to nutritious foods. This study was guided by several research questions:

1. What is the relationship between in-store measures of price and availability and select socioeconomic status (SES) at the neighbourhood-level?
  - 1.1 What is the relationship between neighbourhood-level SES and measures of fruit and vegetable access?
  - 1.2 What, if any, are the differences in food store distribution among neighbourhoods of high, mid and low SES?
2. Among mothers in Saskatoon, what are their perceptions of price and availability of fruits and vegetables within their personal FE?

- 2.1 How do mothers perceive access and affordability to fruits and vegetables among retail outlets in Saskatoon?
- 2.2 How do perceptions of the built food environment differ according to neighbourhood-level SES?

### 1.3 Study design

This study consisted of two phases. In the first phase, quantitative data was collected through survey and census measures. In the second phase, qualitative data was collected through three nested interview types (Creswell & Plano Clark, 2011). In total, six sources of data were collected sequentially: (1) socioeconomic indicators; (2) food store spatial data, (3) in-store measures, (4) sit-down interviews, (5) photovoice interviews and (6) go-along interviews.

This study used the findings of the quantitative phase to stratify neighbourhoods first by SES (high, mid and low), and then by two in-store measures: price and availability of fruits and vegetables. Data for fruits and vegetables were parsed out from survey results to characterize neighbourhood FEs as high or low access. This stratification informed the sampling frames for participant recruitment in the second phase of the study. Interview participants were recruited to represent maximum variation in neighbourhood-level characteristics of food store distribution, affordability and accessibility. A sequence of semi-structured, photo and in-situ interviewing methods were thus used to examine perceptions of affordability and accessibility among mothers of adolescent children in Saskatoon.

### 1.4 How this dissertation is organized

The subsequent literature review provides an overview of some common FE study designs and measurement approaches found in English-speaking countries. This review of the literature highlights the complex nature of foodwork within societal expectations of being a Good Mother. The chapter concludes with an in-depth look at the utility of mixed methodology in FE research and its applicability to this study. Chapter 3 (Methodology) is an in-depth look at

the mixed methods design, data collection tools and analyses used in this study. This chapter describes the rationale behind the selection and sequencing of data collection tools, and offers an explanation of design typology and its relevance to the research questions. Chapter 4 (Findings and Results) presents quantitative data from census, in-store survey, and geographic measures. This is followed by three nested qualitative interview approaches: sit-down, photovoice and go-along. The final chapter, Chapter 5 (Discussion and Conclusion), crafts narratives of Saskatoon's retail FE, offering descriptions of personal FEs through combined analyses of qualitative and quantitative data. The chapter includes a thorough assessment of the study's strengths and limitations, as well as a reflection on some changes in FE research since this study began.

First person narration is used by the researcher in Chapters 4 and 5 (Results and Discussion, respectively). This first-person point of view appropriately conveys the intimate nature of personal FEs and reflects the explicit presence of the researcher in the data. Writing in the first person reflects the challenges the researcher faced in balancing objective data collection with genuine engagement with participants. The latter was critical for creating a relaxed research atmosphere that increased the breadth and depth of the data collected.

Further to the notion of how language and perspective are used in this dissertation, terminology associated with qualitative and quantitative research - and their corresponding paradigms - are frequently combined. The mixing of this language is purposeful and intended to reduce the conceptual distance between qualitative and quantitative paradigms. Such an approach lends support to the notion that mixed methods research is truly 'bilingual' (Tashakkori & Teddlie, 2003). The language of this dissertation draws inspiration from the work of Pierre Bourdieu, a sociologist who sought to overcome the subjective-objective dichotomy in his analyses of food and nutrition. He maintained that, because reality is complex, people should expect to struggle with describing it (Bourdieu, 1984). Further, making sense of everyday experiences is all the more difficult because the researcher is also participating in these experiences (Kamphuis, Jansen, Mackenbach, & Lenthe, 2015). The careful mixing of language in this dissertation also conveys, through words associated with measures and perceptions, the inherent chaos of trying to understand the human experience. If language is to accurately reflect the human experience, it must imbue and reflect back the chaos it represents (Parsons, 2016). As such, the way in which language is used in this dissertation endeavours to reflect the 'messiness' of personal FE realities.

## Chapter 2: Literature Review

This chapter presents literature pertaining to the research of built food environments (FEs), foodwork, motherhood and relational constructions of personal FEs. This chapter provides an overview of built and retail FE research, with a particular focus on Canadian-specific findings. This chapter explores several constructs of built FEs, as well as the data and metrics used to assess these environments. The latter half of this chapter describes the utility of mixed methods study designs that combine objective and perceptual assessments of the retail FE.

### 2.1 Background

The last three to four decades have seen considerable fluctuation in food retail environments, with low income areas experiencing a greater proportion of retail changes, such as the exodus of affordable supermarkets to suburban and wealthier areas (Filomena, Scanlin, & Morland, 2013). The food retail trend in North America has been moving toward ever bigger store sizes with an increasing array of offerings, particularly in rapidly sprawling cities (Ziff, 2016). In cities characterized by sprawl, urban development stretches outward as sites of new food store development are, also, likely to be pushed further outwards (Le & Muhajarine, 2013).

Examining the relationships between context and choice – the characteristics of a neighbourhood and where to buy food, respectively - requires closer examination of housing, urban development, industry and agriculture, among others (Feng et al., 2010). Mixed land use, characterized by interconnected streets and moderate-to-high population density, can encourage active transport and promote a sense of cohesion and community in neighbourhoods (Hill et al., 2012). Studies have found, however, that such community-promoting features are often lacking from car-dependent neighbourhoods (Feng et al., 2010; Handy & Clifton, 2001), particularly where sprawl defines urban development. Grid patterns, sidewalks, and developed public transit are more often found together in older areas of cities or in traditional, pre-World War II neighbourhoods, which tend to have a higher density and diversity of destinations (Khan, Calloway, Maida, & Rakel, 2012; Le & Muhajarine, 2013; Townshend & Lake, 2009). These neighbourhoods were built and developed before the widespread use of personal vehicles,

embodying more pedestrian- and cyclist-friendly neighbourhood design. As cities have grown, municipal boundaries have expanded into suburban developments, often resulting in urban designs that are significantly more car-dependent, less pedestrian-friendly and less encouraging of physical activity overall (Le & Muhajarine, 2013).

## 2.2 Built food environments

A built environment can be understood as the physical design, land use patterns (residential, commercial, office, industrial and other activities) and transportation systems of specific spaces (Feng et al., 2010). The built **food environment** (FE), then, represents the sum total of human-made spaces from which to access food, such as grocery stores, restaurants, farms, and food banks (Glanz et al., 2007). The built FE affects how people acquire, consume, and dispose of food in complex and multifaceted ways. As evident throughout this study, built FEs are complex.

## 2.3 Nutrition and health

A healthy diet is one high in fresh fruit and vegetables and low in processed, energy-dense food (Public Health Agency of Canada, 2011). A healthy diet, when combined with physical activity, offers protection against the onset of many chronic illnesses. It is evident, however, that there is little benefit in encouraging people to eat more fruits and vegetables if the food outlets accessible to them do not offer these choices at affordable prices (Kamphius et al., 2006). The cost of nutritious food can be a barrier to healthy eating for people with low incomes (Kirkpatrick & Tarasuk, 2011; Paquette, 2005; Raine, 2005). When nutritious food is more expensive than energy-dense, fat- or sugar-laden food, it puts a balanced, healthy diet out of reach for people with limited finances (Drewnowski & Barratt-Fornell, 2003; Inglis, Ball, & Crawford, 2009; Kirkpatrick & Tarasuk, 2011; Raine, 2005; Willows, Veugelers, Raine, & Kuhle, 2011).

Earlier nutrition-focused research often used an obesity-grounded approach to study environmental impacts on health (Feng et al., 2010; Hill et al., 2012; Townshend & Lake, 2009). At the time, obesity was, and still is, an issue of global concern when examined in the context of chronic and preventable conditions. Obesity has been linked to long-term outcomes such as diabetes and cardiovascular disease (Health Canada, 2013), and has often been used as a marker of diet quality. As the field of FE research grew, proximity to healthy food stores was often used as a proxy for a healthy diet (Latham & Moffat, 2007). In this way, obesity soon became embedded within environmental nutrition research norms (Burgoine, Alvanides, & Lake, 2013), which then wended its way into built FE research.

## 2.4 Model of Community Nutrition Environments

Glanz et al's Model of Community Nutrition Environments in 2009 (see Figure 2.1), was a popular approach to conceptualizing several constructs of the built FE (Glanz, 2009). In this model, constructs of accessibility included measures like food outlet locations and hours of operation. Known as the Community FE, this construct of accessibility can be understood as the food retail outlets available to a person within a spatial unit. Similarly, the Consumer FE represents constructs of affordability of a food outlet. This encompasses the availability and cost of healthy food options in food stores, as well as the information available on-site about healthy and less healthy food choices. This type of environment is assessed according to the range of healthy choices on offer, as well as price, promotions, product placement and nutritional information. The Glanz et al model is rooted in the notion that Community and Consumer FEs influence eating behaviors, and that these effects are moderated by individual characteristics such as socioeconomic factors, health status, and psychosocial factors (Green & Glanz, 2015). The Consumer and Community FEs, as conceptualized in this model, are the focus of this dissertation.

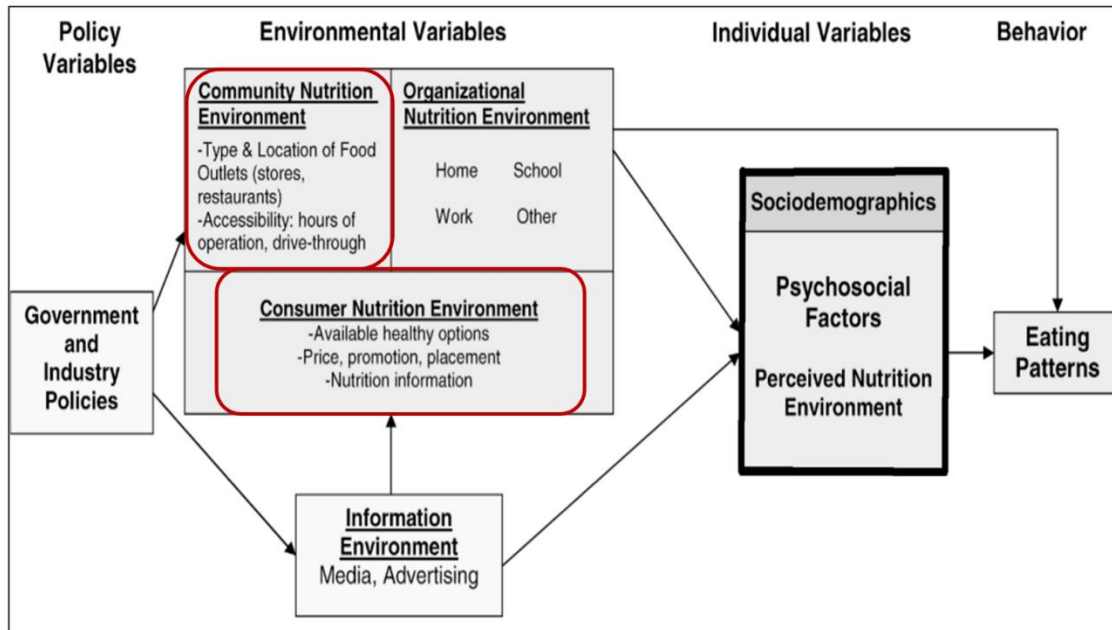


Figure 2.1: Model of Community Nutrition Environments (Glanz et al., 2005)

This study focuses on two specific constructs within Consumer and Community FEs: affordability and accessibility, respectively. These constructs were reflected in the quantitative assessments of in-store offerings (affordability) and store locations (accessibility). This employs definitions of accessibility and affordability within built FEs from the work of Andress and Fitch (2016). Here, **affordability** is defined as whether individuals are able to pay for the food that is geographically available, which is a construct used in this study to gain insight into assessments of food prices and people's perceptions of the worth of different foods relative to its cost. **Accessibility** is defined as an individual's ability physically to get to, or make use of, the food that is available to them, examining the geographic locations of the food supply and the ease or difficulty of getting to that location (Andress & Fitch, 2016).

### 2.2.1 Measuring the built food environment

In 2009 and again in 2017, Lytle et al. identified four key challenges to accurately measuring the built food environment: (1) defining the components of the food environment, (2) identifying all relevant healthy and unhealthy food sources, (3) evaluating variables that can be

used to differentiate between the quality of, and access to, food sources, and (4) accurately locating all food sources (Lytle, 2009; Lytle & Sokol, 2017). A review of FE literature by Feng et al. in 2010 also revealed conceptual and methodological limitations within this field because many researchers do not agree on issues related to data sources, food outlet definitions, and spatial extent of neighborhoods. A lack of consensus on some of these issues can make it difficult to spatially or temporally compare FE research findings. As noted later in the chapter, the greater inclusion of qualitative methods and analyses has ameliorated some of the challenges with these issues.

### 2.2.2 Geographic measures

Spatial measures and assessments have been useful for characterizing built features of FEs, such as the rectilinear road segment distance - also known as Manhattan distances - to food stores locations (Wilkins, Morris, Radley, & Griffiths, 2019). These road segment measures offer an objective assessment of distance and travel time. The distance between a point of origin and a destination is known as Euclidean distance or, more colloquially, 'as the crow flies.' Euclidian distance represents an objective measure of how far apart two locations are, but it does not represent an actual travel route once road networks are taken into account. In built FE research, Euclidean measures characterize the landscape of retail food outlets and broader built environment infrastructure, such as while Manhattan measures can characterize travel times and travel impedance (Wilkins et al., 2019).

These spatial practices were, and remain, a functional way to assess geographic attributes of Community FEs. As spatial technology has become more widely accessible, geographic information systems (GIS) such as Google Maps, ArcGIS and other navigation systems are used to locate points of interest and map out routes accordingly (Kestens & Daniel, 2010). An important point to note is that GIS's do not capture relatedness between locations but, rather, construct it. "Relationships represent an assembly of isolated pieces of geographical information that have been torn from their context and 'corrected' separately" (Shelton, 2017, p. 726).



### 2.2.3 Spatial descriptions

Several land-based metaphors have entered the lexicon of FE literature and have become common parlance (Teigen & Jess, 2019; Widener, 2018). Three of the most common are food deserts, food swamps and food mirages. **Food deserts** describe areas with no or few healthful options, and the term is typically used to mean the absence of grocery stores. **Food swamps** describe areas with many unhealthful options and is often used to denote areas with many convenience stores or fast food outlets (Lamichhane et al., 2013). Lastly, less commonly used is **food mirage**, a metaphor which has been used to describe areas where food is available for sale but priced too high to be affordable. A food mirage is a place where “grocery stores are plentiful but prices are beyond the means of low-income households, making them functionally equivalent to food deserts in that a long journey to obtain affordable, nutritious food is required in either case” (Breyer & Voss-Andreae, 2013). An example of a food mirage would be an abundance of boutique food stores in a low-income neighbourhood without a grocery store. Beyond empirical challenges (Wrigley, 2002), these land-based metaphors of deserts, swamps and mirages obfuscate the broader political, economic and social issues that create and maintain these environments (Widener, 2018).

A significant challenge of ascribing healthy or unhealthy attributes to spatial units, as noted in the land-based metaphors described above, has been the significant variation in administrative or industry data categorization (Minaker et al., 2016). For instance, Cummins and McIntyre (2002) developed their own food store classifications system of multiples (chain stores) and independents, while Pouliot and Hamelin (2009) define food stores by square footage: A grocery store has an average surface area smaller than 8000 square feet, a supermarket is between 8000 - 30,000 square feet, and a superstore spans more than 30,000 square feet. Superstore formats are also known as hypermarkets (Sanghavi, Smith, & Wills, 1989), a term used in this study to refer to large supermarkets that offer a wide array of non-food items, such as clothing, furniture and electronics. The term hypermarket, and not the term superstore, is used in this dissertation to disambiguate this food store type descriptor from a chain of hypermarkets in Saskatoon called Superstore.

The expansion of food stores into hypermarkets (Hausman & Leibtag, 2007), has forced the closure of smaller, independent, neighbourhood food stores that cannot compete with such

economies of scale (Hosler & Dharssi, 2010). Ultimately, this creates areas where affordable and varied food is only accessible to people with a car, or where stores are served by efficient public transit (Larsen & Gilliland, 2008; Smoyer-Tomic, Spence, & Amrhein, 2006; Walker, Keane, & Burke, 2010). The rise in hypermarkets has been facilitated by increases in car ownership, refrigerators, freezers, and the expansion of suburban residential developments that offer more storage space via larger houses. Such storage space is essential for benefitting from the economies of scale to save money, where lower per-unit prices are based on large food formats purchases (Jackson, del Auguila, Clarke, Hallsworth, de Kervenoael, & Kirkup, 2006).

### 2.3 Food systems and food shopping

The current built FE offers a wide variety of convenient, palatable, energy-dense and low-cost food, but the diversity of products available to consumers may be more illusory than real. Food stores, or the retail FE, “offer an organized ensemble of food products that are processed to a greater or lesser extent, then aggressively marketed to consumers” (Jaffe & Gertler, 2006, p. 144). These commodities are globally controlled by a remarkably small number of corporations that have a powerful vested interest in *not* letting food consumption behaviours simply be a random act of the average consumer (Jaffe & Gertler, 2006; Winson, 2013). Indeed, early on in FE research, Jackson et al questioned notions of *choice* and *behaviour*, postulating that choice within the built FE is reduced to corporate geography: choice is stripped down to a financial transaction within a contained space, an approach that ignores the socially-embedded nature of food (Jackson, del Auguila, Clarke, Hallsworth, de Kervenoael, & Kirkup, 2006).

### 2.4 Canadian food environments

Studies of large Canadian cities, such as Montreal and Edmonton, have found that neighbourhood affluence is not a consistent predictor of access to supermarkets or fruit and vegetable vendors (Apparicio, Cloutier, & Shearmur, 2007; Black, Carpiano, Fleming, & Lauster, 2011; Smoyer-Tomic et al., 2006, 2008). In Edmonton, inner-city and high-needs

neighbourhoods (for instance, neighbourhoods with high proportions of elderly residents and low vehicle ownership), were found to have better access to supermarkets than elsewhere in the city. This resulted from the location of food stores in the city centre, many of which were along major roads and intersections (Smoyer-Tomic et al., 2006). Apparacio et al.'s research in 2007 concluded that food deserts do not represent a major problem in Montréal, going on to say that geographic accessibility to healthy food is not a major issue in the city. Instead, they argued, prevention efforts should be directed toward the understanding of other mechanisms leading to an unhealthy diet, rather than attempting to promote an even spatial distribution of supermarkets (Apparacio et al., 2007). Black et al (2011) examined food access in census tracts across British Columbia, in urban areas. In the eight cities studied, they found that neighbourhoods with higher median household income had significantly decreased access to food stores, to the effect that every \$10,000 rise in median household income resulted in lower food access. A Quebec study of rural and urban food access by Pouliot and Hamelin (2009) found inequalities in fruit and vegetable access, with quantity and diversity varying significantly by store type. Findings from Larsen and Gilliland's London, Ontario study indicate that residents of inner-city neighbourhoods of low socioeconomic status have the poorest access to supermarkets. Spatial inequalities in access to supermarkets have increased over time, particularly in the inner-city neighbourhoods where distinct urban food deserts now exist. It is important to note, however, that the relationship between low SES and low supermarket access was attenuated when public transit was taken into account (Larsen & Gilliland, 2008).

Overall, the majority of studies in urban Canada have found that access to grocery stores and supermarkets in lower SES areas is as good as, sometimes even better than, higher SES areas. On the other hand, this review of the literature found consistent evidence of areas meeting the definition of food swamps in urban Canada, where lower SES areas had more access to unhealthy foods than healthy foods. The greater presence of unhealthy outlets compared to the absence of healthy outlets has important policy and program implications that address the reality of facing greater, not fewer, food store options (Minaker et al., 2013).

## 2.5 Saskatoon's built environments

Saskatoon is a medium-sized city in the Canadian Prairies (Engler-Stringer, Muhajarine, Le, del Canto, & Ridalls, 2014). The city has experienced sprawl-like urban development, where new neighbourhoods are built along the periphery of the city (Le & Muhajarine, 2013). Planning eras indicate when swaths of neighbourhoods were established (see Figure 2.2). Neighbourhoods were first developed in Saskatoon between 1900-1930 in the centre of the city, bifurcated by the South Saskatchewan river that runs through the city. In just over 100 years, Saskatoon has grown from eight neighbourhoods to more than 65 (City of Saskatoon, 2015).

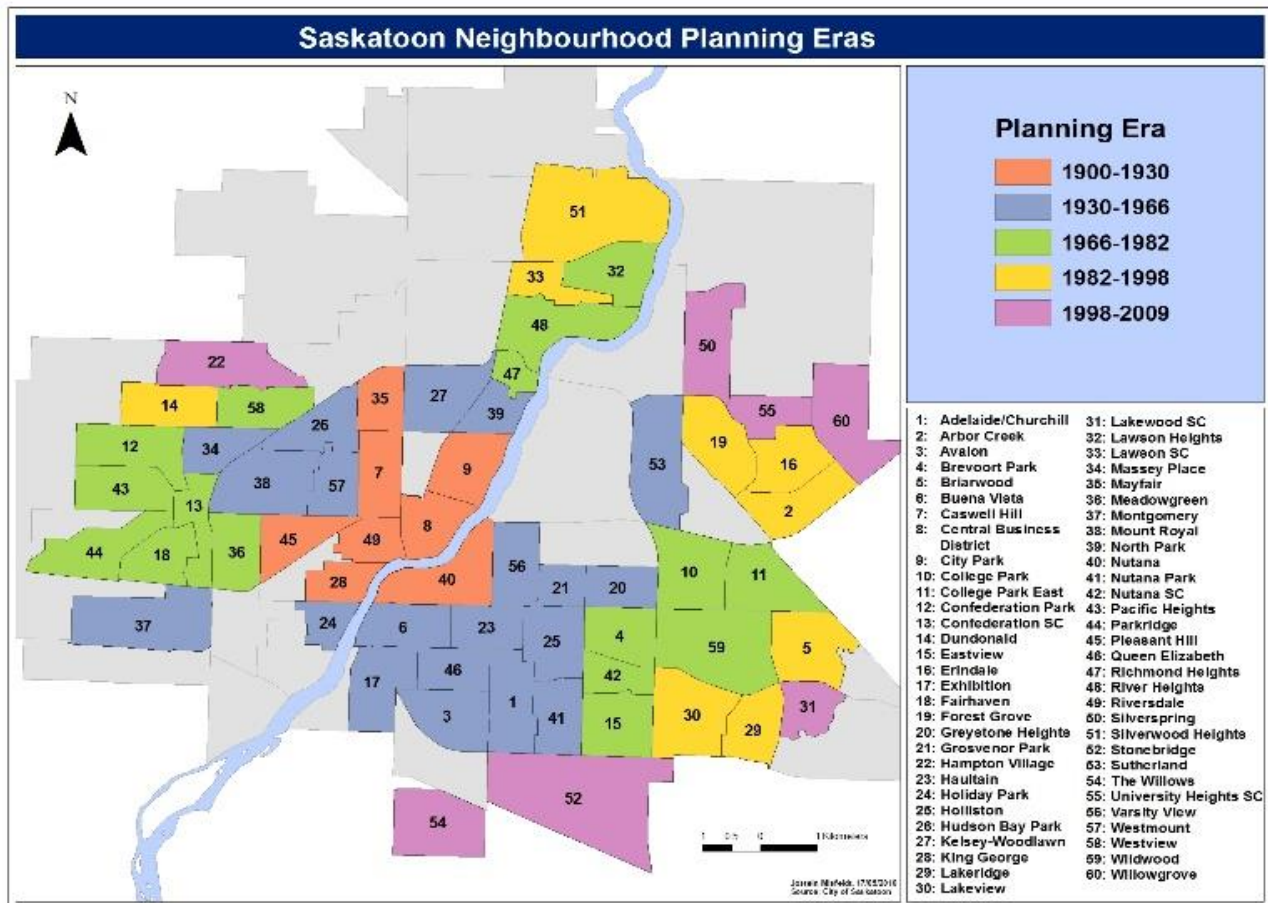


Figure 2.2: Saskatoon neighbourhood planning eras (Le & Muhajarine, 2013)

### 2.5.1 Saskatoon's built food environments

Peters and McCreary were among the first to document geographic inequity in the distribution of supermarkets across Saskatoon's neighbourhoods.

The changing spatial structure of grocery food stores in Saskatoon has resulted in substantially reduced access to low cost healthy foods for the highest poverty neighbourhoods in Saskatoon. Like trends in retailing documented for other urban areas, there was a growth in the number of major grocery chains located in suburban locations during the period of this study. There were also some major grocery chains that located in more central areas of the city, but none on the West side. As poverty became increasingly concentrated on the West side of the city, major grocery stores were closed nearest to these neighbourhoods. Other areas saw new grocery stores being opened, with no accompanying closure of major chains. (Peters & McCreary, 2008, p. 98).

Place-based health disparities in Saskatoon run deep: After statistically controlling for other variables (demographics, other socioeconomic status, cultural status, disease intermediaries, other health disorders, behaviours, life stress and health care utilization) Lemstra and Neudorf (2008) found that low income residents in Saskatoon's West side were 50% more likely to report low self-reported health, 196% more likely to have diabetes, and 118% more likely to have heart disease (Lemstra & Neudorf, 2008).

In the last few years, food prices in Saskatchewan have risen faster than overall inflation. The greatest price increases were for meat, milk, eggs and bakery products. Prices for fish, fresh vegetables and fruit have also increased, but to a lesser extent (Kouri Research, 2013). Wang (2016) examined the effects of socio-economic status on residents' fresh food access in Saskatoon and Regina, Saskatchewan's two largest cities. Spatial findings were that areas with a larger percentage of population density, single-parent households, senior populations, higher educational populations, and minority groups tend to have higher access to supermarkets and local grocery stores, noting that the effects vary by city. The influence of public transportation was found to be insignificant in both cities. Wang posited that ignoring spatial interaction could overestimate disparities of food access inequality among residents with different socio-economic status (Wang, Tao, Qiu, & Lu, 2016).

A needs assessment by Kouri Research (2013) looked at attitudes and practices surrounding food access in Saskatoon. They found that residents were increasingly educated

about nutritious food and were demanding more healthy food and more local food. Residents recognized the need to decrease population-level diabetes and obesity. They understood that health disparities in Saskatoon must be reduced, and that emerging health concerns from large scale food processing must be addressed. There was growing concern about impacts on the environment and that the climate crisis means food shortages everywhere, making food self-sufficiency imperative.

### 2.5.2 Smart Cities, Healthy Kids

Smart Cities, Healthy Kids (SCHK) is a Saskatoon-based study that looks at connections between municipal policy and neighbourhood-level built environments. Built environments were assessed in terms of physical activity, food environments, urban planning, public health, geography and municipal decision-making. Three neighbourhood designs were assessed: (1) core neighbourhoods developed before 1930 that follow a grid pattern; (2) fractured-grid pattern neighbourhoods that were developed between the 1930s and mid-1960s; and, (3) curvilinear-pattern neighbourhoods that were developed between the mid-1960s through to 1998. In the first SCHK study, children aged 10-14 years (n=455; mean age 11.7 years), grouped by the neighbourhoods they resided in, had their physical activity and sedentary behaviour objectively measured. Analyses demonstrated that group differences were apparent on weekdays but not on weekends. When age, sex and family income had been controlled for, children living in fractured-grid neighbourhoods engaged in less physical activity than the children in the core and curvilinear-pattern neighbourhoods.

### 2.6 Foodwork as motherhood

The term ‘foodwork’ captures the broader ‘occupation’ of meal planning, food shopping, cooking and disposal or storage of food (Beagan, Chapman, & Power, 2018). For many, foodwork is a quotidian labour rendered nearly invisible due to its routine and implicit nature. Upon closer inspection, successful foodwork means knowing household palate preferences when shopping and cooking. These palate preferences are consciously or unconsciously factored into

other shopping-related considerations: What foods are (or are not) in the storage of refrigerators, freezers, cupboards and drawers? What foods are healthy, will get eaten at home and not be wasted? What schedules must be taken into account to know who will eat when? What is the current food budget and where are there sales? In short, foodwork is complicated (Parsons, 2016; Wright et al., 2015).

In many cases, even where cooking or shopping is a shared task within the household, mothers are still performing the majority of the foodwork (Davis, Hogg, Marshall, Petersen, & Schneider, 2018). Foodwork is one of many societal expectations of being a Good Mother and is necessary to the creation and maintenance of a cohesive family (DeVault, 1991). As part of their foodwork, mothers are expected to balance their own time and financial resources with the expected norms of keeping their family well-fed and happy. “Because of the dominant role women still have in family food provisioning, nutrition education promoting healthy eating is often directed towards them” (Slater, Sevenhuysen, Edginton, & O’Neil, 2012, p. 406).

Mothers are important actors in the FE as they are often called on to be nutritional guardians in their household, responsible for purchasing and preparing food for their family in their socially-expected role as a mother (DeVault, 1991). Food preparation and consumption practices of mothers are likely to influence what other members of their family eat, particularly children who are not yet old enough to purchase or prepare their own foods. This foodwork influence has long term impacts on the food purchasing and preparation practices that their children may subsequently develop (Martin & Lippert, 2012). The role that mothers play in provisioning food for their family, and the transfer of nutritional knowledge to their children, is well-documented (Johnson et al., 2010; Rosenkranz & Dzewaltowski, 2008).

Indeed, despite decades of gender equality in the public sphere and neo-liberal assertions regarding individualism, ‘feeding the family’ (DeVault, 1991) continues to be a highly gendered activity, with the added pressure of now having to provide ‘healthy’ food cooked from scratch (Parsons, 2016, p. 382).

This food provision role cuts across all levels of SES, whereby food consumption is a central activity of family life, a series of complex actions and events that require effort to sustain. Overwhelmingly, these efforts fall upon mothers to manage (Brady et al., 2018). The ‘invisible’ nature of food practices becomes apparent, and the class context of this work becomes particularly evident upon examination of food procurement practices (Johnson et al., 2010;

Wright et al., 2015). Reflecting on the complexity of eating in this way, the dominant model of capitalism and consumer behaviour hides the structural economic factors that determine access - resources, availability, distribution and marketing (Bisogni, Connors, Devine, & Sobal, 2002; Jaffe & Gertler, 2006; Parsons, 2016; Winson, 2013).

## 2.7 Activity space as built food environments

Representations of physical space are what come to mind when conceptualizing FEs as empirically measurable spaces (Green & Glanz, 2015). As noted earlier in this chapter, FE research has historically emphasized quantitative characterizations of built environments, adopting the geographic assumption that things that are closer together are more related than things that are further apart (Charreire et al., 2010). Following this assumption, food stores within the predetermined radius of specific nodes (such as home or school) would have a more direct relationship on people than stores outside of these Euclidean circumferences (Caspi, Kawachi, Subramanian, Adamkiewicz, & Sorensen, 2012). Conversely, the absence of food stores with healthy offerings was often deemed to have a more direct effect than the absence of food stores in other areas (Kelly, Flood, & Yeatman, 2011). This line of thinking is evident in the pejorative metaphors used to describe built FE spaces, described earlier in this chapter. The application of terms like food desert and food swamp is rooted in geospatial assessments, but food store type characterizations can be problematic in that not all convenience stores are automatically bad, and that not all supermarkets are inherently good (Thornton et al., 2012).

A much more nuanced spatial characterization is activity space, a geosocial representation of how people engage with their built environment (Lamichhane et al., 2013). Activity space captures the opportunities and exposures of the physical environment, which in turn allows researchers to assess how people experience and navigate their personal FE. “Individuals shape activity spaces based on their perceptions, opportunities, and desired exposures to resources and risks” (Price, Bridget, Jo, & Raul, 2017). Activity space also differs by gender, often because of differences in foodwork and parenting obligations (Brady et al., 2018).



## 2.8 Personal food environments

*The perceived food environment implicitly accounts for factors like economic accessibility, cultural appropriateness, and the temporal availability of stores, though, depending on the data collection tools, it can be difficult to disentangle all of these factors*  
(Widener, 2018, p. 259)

The personal FE represents the subset of places that an individual has chosen from among all the places accessible to them in the built FE (Desjardins, 2010). This highly subjective construct builds on activity space characterizations by describing the personal meaning of places within these spaces, embodying a person's experiences and perceptions that are connected to those places (Kane & Pamphilon, 2015). Quantifiable, representational spaces within Consumer and Community FEs can contextualize people's "experience of a space through symbolic values; the subjective, imagined or perceived spaces of the personal FEs" (Desjardins, 2010, p.13).

With this view of place and experience as mutually constitutive, I have termed the collective array of places that a person routinely visits to buy food the personal food environment, a construct that I use as a tool for collecting data" (Desjardins, 2010, p.3).

Thompson et al.'s study (2013) of low-income shoppers demonstrated that residents of disadvantaged neighbourhoods do not have a uniform response to, nor interaction with, their local FEs. The researchers documented the in-store behaviours of participants living in economically disadvantaged neighbourhoods. Participants labelled as *resilient* were described as shopping for food more effectively on a restricted budget and didn't respond to in-store prompts (such as marketing and promotions) to the same extent that others did (Thompson, Cummins, Brown, & Kyle, 2013). While some shoppers appeared to be more resilient to environmental cues and prompts, others seemed more susceptible to particular features of the supermarket environment and more likely to engage in passive food shopping behaviours. An important finding of this study was that financial resources alone were not a sufficient indicator of how people shopped for food.

## 2.9 Assessments of food environment perceptions

Qualitative research can shape characterizations of built FEs, particularly individuals' experiences and perceptions in the context of health promotion (Attorp et al., 2014; Popay, 2006). A constructivist paradigm can offer nuanced insights into spaces of influence and into pathways that connect environmental and individual health. Research grounded in qualitative methodology can take place-based assessments beyond traditional epidemiologic measures, contextualizing perceptions of built and retail FEs. This moves past a singular, pathologizing view of the built FE and integrates economic and political considerations that shape built FEs. Spatial analyses of personal FEs must be applied in tandem with a political-economic analysis of the socio-cultural structure of food economies. This approach facilitates an understanding of how people confront, adapt to, or resist their built FE.

Qualitative methods can extend existing quantitative research by providing an in-depth understanding of residents' perspectives. By means of using both objective neighbourhood-level measures and subjective perceptions, we may gain a more comprehensive understanding of how the food environment influences residents' diets (Díez et al., 2017, p.2970).

Quantifiable, representational spaces can be described through the lived experience of a space, through symbolic values; the subjective, imagined or perceived spaces of the personal FEs. Objective measures include records of price, measures of distance and locations of food stores. Perceptual assessments include narratives of food store experiences and descriptions of foodwork practices (Vogel et al., 2019). In retail FEs, the count of outlets indicates relative availability and might also indicate that eating a certain type of food is common or prevalent in that area. According to Wilkins et al (2019), relative availability may best capture the normalisation of retail FE attributes which, if accurate, will require multiple measures to adequately capture the retail FE.

## 2.9.1 Quantitative assessments of the built FE

### 2.9.1.1 Nutrition Environment Measurement Survey for Stores (NEMS-S)

The *Nutrition Environment Measurement Survey for Stores (NEMS-S)* was originally developed by researchers at the University of Pennsylvania to measure healthy food options in supermarket and convenience stores in four neighbourhoods in Atlanta, GA, which differed in income and community design (Glanz et al., 2007). A related measure, NEMS-R, was developed to assess restaurant and fast-food healthfulness. Both NEMS-S and NEMS-R tools have been tested extensively for reliability (test-retest kappa 0.73-1.00 and inter-rater kappa 0.84 to 1.0) (Glanz et al., 2005, 2007).

To administer NEMS-S, trained raters complete a survey instrument in each food store based on a series of structured observations. The observations are based on constructs of Price, Availability and Quality for ten indicator food categories: milk, fruit, fresh and frozen vegetables, ground beef, hot dogs, frozen dinners, baked goods, beverages, chips, and cereal. The rater first looks for the ‘reference’ brand of each food type, usually the most commonly available brand name product for that item. The rater then looks for the healthier option of that food type, and then compares the Availability and Price of those available in relation to the reference brand. Quality is also measured in relation to fresh fruits and vegetables as a ‘Yes’ or ‘No,’ where Yes is marked if the rater perceives more than 50% of the produce item offerings to be something that they would purchase. Measures of Availability and Price are captured as continuous variables, whereas Quality is dichotomous. Raters complete online NEMS-S training which addresses interpretation of Nutrition Facts food labels, identifying portion sizes, uniformly comparing prices of regular versus healthier items, as well as defining, listing, mapping, and establishing categories of food outlets (Glanz K, Sallis J, Saelens B, 2007).

## 2.9.2 Qualitative assessments of the personal FE

*Stories retain the complexity of a situation in which an action occurred, while holding the emotional and motivational meaning attached to it. Humans live storied lives, so when others tell their stories, those receiving the story can understand the actions of others through recognition of similar experiences in their own (Kane & Pamphilon, 2015, p. 587)*

### 2.9.2.1 Personal FE narratives

Crystalizing personal FEs through participant narratives contextualizes people's perceptions and uncovers the "complexities, contingencies and contradictions in an ever-changing context of time, experiences, places and people" (Kane & Pamphilon, 2015, p. 591). In-depth interviews have the potential to turn abstract concepts of personal urban spaces into meaningful discussions about how every day or routine activities influence meanings of these personal spaces. Qualitative, semi-structured interview methods are ideally suited to research questions that seek to elucidate critical issues within a specific focus, and where some background on the topic is already known to the researcher (Creswell, 2007). Semi-structured interviews are a way to guide conversation on a particular topic such that inquiry feels natural and unscripted. The interview guide allows space for the researcher to follow up on concepts and issues as they arise during the interview.

### 2.9.2.2 Photovoice interviews

*Photovoice interviews* (PVI) are a qualitative research method in which individuals are asked to photograph their everyday realities in response to interview questions (Clark-Ibañez, 2004). The questions serve as prompts to uncover elements which can be difficult to capture through traditional data collection methods such as semi-structured interviews and, subsequently, participants work with the researcher to interpret and analyze the images (Masuda et al., 2012). This approach to data collection is useful when attempting to reveal information that is inaccessible through discussions alone, such as behaviours or patterns that are so commonplace to the participant that they are almost invisible (Johnson et al., 2010). Images are given meaning by participants' interpretations of the spaces photographed, where objective characterizations alone might not convey the experience of navigating those spaces.

### 2.9.2.3 Go-along interviews

In order to observe, engage and discuss with participants their interpretation of their personal FE, go-along interviews are an effective way to glean insights from the visual cues and prompts that would otherwise be missed in more static interview contexts. Go-along interviews are a variation on semi-structured interviewing techniques and have great utility for exploring peoples' experiences in situ. Similar to PVIs, go-along interviews are an engaged qualitative method for studying the health issues of local-area contexts (Carpiano, 2009; Díez et al., 2017). Through asking questions and observing, researchers can better understand the participant's experiences, interpretations and practices within this environment. Thus, as a means of obtaining responses from participants while they actively inhabit specific contexts, the go-along interview is a unique tool for meeting the challenges of understanding how physical, social, and mental dimensions of place and space interact within, and across, time for individuals (Carpiano, 2009, p. 271).

### 2.9.3 Mixed methodology in FE research

Mixed methodology has been posited as an appropriate conceptualization of the realities of human behaviour, capturing the complex interrelations of built FEs (Desjardins, 2010; Gustafson, Hankins, & Jilcott, 2012; Lytle & Sokol, 2017; Minaker, 2016). Place-based research has traditionally taken a conventional view towards geography, where people and places are separated by physical distance (Charreire et al., 2010; Elinder & Jansson, 2009). A relational view considers, instead, that people and places are separated by both conventional and socio-relational distances, where area definitions are relatively dynamic and fluid. Considering the complexities of FE research design and interpretation of findings, a relational approach – offered through the purposeful combination of qualitative and quantitative data - can better capture perceptions of the built FE. “Some components of the built food environment are quantifiable while others are best expressed through narrative” (Desjardins, 2010, p. 2).

### 2.9.3.1 Mixed method study design considerations

A mixed methods study presents unique considerations and possible challenges not found in strictly qualitative or quantitative studies. Quantitative study designs generally begin from the assumption that the researcher is an objective observer, an unbiased agent of data collection and analysis even though post-positivism recognizes that bias is inherent in the research process (Creswell, 2007). Within qualitative research designs, regardless of the specific approach, the researcher is never seen as completely neutral (Hessy-Biber & Leavy, 2011). All investigators bring with them some interest, be it personal or professional, to the research topic (Tashakkori & Teddlie, 2003). Prior understandings of the subject area affect - implicitly and explicitly - the research design. Before or throughout the project, the findings from relevant literature, media stories and other sources of information can impact the researchers' knowledge of the topic, and interactions throughout data collection can affect perceptions between both participants and the researcher (Patton, 2001). Nutrition is an integral component of daily well-being and, as a research topic, it is difficult to remain completely disconnected from it. *Bracketing* of one's personal views, biases and assumptions is an important component of both qualitative and quantitative research (Giddens, 1983), and efforts were made throughout the study by the researcher to identify and exclude personal opinions and biases. Bracketing, however, represents only a fraction of the efforts needed to ensure rigour. In a study such as this, where foodwork is a universal experience, personal opinions are unavoidable. Acknowledging that these opinions exist makes it easier to identify when and where these opinions might affect data collection and analysis.

The next chapter (Research Methods) delves further into the study design and data collection tools used in this study. It provides an overview of mixed methods typology and notation, a description of each data collection tool, as well as explanations of data reduction, management and analytic approaches.

## Chapter 3: Research Methods

*Mixed method inquiry is an approach to investigating the social world involving more than one methodological tradition and thus more than one way of knowing, along with more than one kind of technique for gathering, analyzing, and representing human phenomena, all for the purpose of better understanding* (Johnson, Onwuegbuzie, & Turner, 2007, p.119).

### 3.1 Background

In this chapter, thorough descriptions of the design, implementation and analytic approaches used in this study are presented, building on the brief background of mixed methodology introduced in the previous chapter. The utility of mixed methods' pragmatism in this retail FE study is presented, detailing the data collection tools used to examine relevant dimensions and constructs of the personal FE. The objective of the study, research questions and epistemic underpinnings are explicated, and each stage of sampling and data collection is expanded. Table 3.1 summarizes the data collection tools and analytic approaches used in each quantitative and qualitative phase. The penultimate section of this chapter describes the processes used to create sampling frames, manage large amounts of data, code sequentially through mixed deductive and inductive iterative categorization, write up findings and critically reflect on rigour. The chapter closes with a summary of ethical approvals and exemptions from the University of Saskatchewan. In the fifth and final chapter (Discussion and Conclusion), there is an overview of what has changed in the field of FE research since beginning this study, including aspects of this methodology.

### 3.2 Study objectives

The overall objective of this study was to examine foodwork practices in the context of retail FE perceptions – specifically, affordability and accessibility - from the perspective of mothers of adolescent children in Saskatoon, Canada. This study looked at their foodwork in Consumer (within-store) and Community (between-store) FEs. The aim was to gain a better understanding of how retail FE perceptions influenced foodwork, which can then be used to

inform policy and programming development in mid-sized urban centres that would improve access to fresh fruits and vegetables.

Of note, restaurants, fast food and similar outlets were not included in this study. Since the focus is on fruit and vegetable access, sites serving predominantly prepared foods at sit-down locations are unlikely to offer a range of fresh, frozen or canned fruits and vegetables.

### 3.3 Research Questions

To understand foodwork practices in the context of the retail FE, two broad research questions were divided into phases, with each phase consisting of several sub-questions:

#### 3.3.1 Phase 1: Quantitative

1. What is the relationship between in-store measures of price and availability with select socioeconomic indicators at the neighbourhood-level?
  - 1.1 What is the relationship between neighbourhood-level socioeconomic status and measures of fruit and vegetable access?
  - 1.2 What, if any, are the differences in food store distribution among neighbourhoods of high, mid and low SES?

#### 3.3.2 Phase 2: Qualitative

2. Among mothers in Saskatoon, what are their perceptions of price and availability within their personal FE?
  - 2.1 How do mothers perceive access and affordability to food among retail outlets in Saskatoon?
  - 2.2 How do perceptions of the built food environment differ according to neighbourhood-level socioeconomic status?



Mixed methods typology succinctly conveys study designs and provides a systematic approach to describing the structure and design of research method combinations. Typologies take complex study design features and simplify them into portable design descriptors that can be carried from one study to another (Leech & Onwuegbuzie, 2009). To make FE mixed methodology research more accessible to a wider audience, and to facilitate communication about study design, typologies help to the simplify FE dimensions that need to be considered (Johnson et al., 2007). “Typologies are designed to impose order and simplify complex phenomena for didactic, organizational, and communicative purposes” (Guest, 2013, p. 141). Guest explicates five reasons why typologies are critical to mixed methodology: to provide tools that help researchers design their study, establish a common language for the field, provide structure to the field, legitimize the field, and present useful pedagogical tools (Guest, 2013).

### 3.5 Study design: mixed methods notation

To signify typology, notations are used to describe how quantitative (*quan*) and qualitative (*qual*) strands are used in a study (see Literature Review). This study uses a *quan* → *QUAL* explanatory sequential research design, where results from the quantitative portion inform qualitative data collection and analysis (Fetters, M., Curry, L., & Creswell, 2013). The study is divided into two phases that begin with the collection and analysis of *quan* data, followed by (→) the collection and analysis of qualitative *QUAL* data. This notation indicates that more weight is given in this study to qualitative analyses (Creswell & Plano Clark, 2011; Tashakkori & Teddlie, 2003). The → also temporally reflects how quantitative data was used to inform the qualitative phase, emphasizing the importance of this particular sequence of study design. See Figure 3.1.

The typology of this study is a combination of **development** (inform a qualitative sampling frame from quantitative results) and **expansion** (nested interview approaches to understand personal FEs) (Leech & Onwuegbuzie, 2009). In the first phase, three types of assessments quantified aspects of the Consumer and Community FEs in Saskatoon’s residential neighbourhoods: census, in-store survey, and store locations. In the second phase, three successive interview types were used to examine perceptions of these same FEs aspects. Using a

nested - sequentially narrower - sampling frame, mothers from neighbourhoods of varying SES and built retail FE features were interviewed about their foodwork experiences.

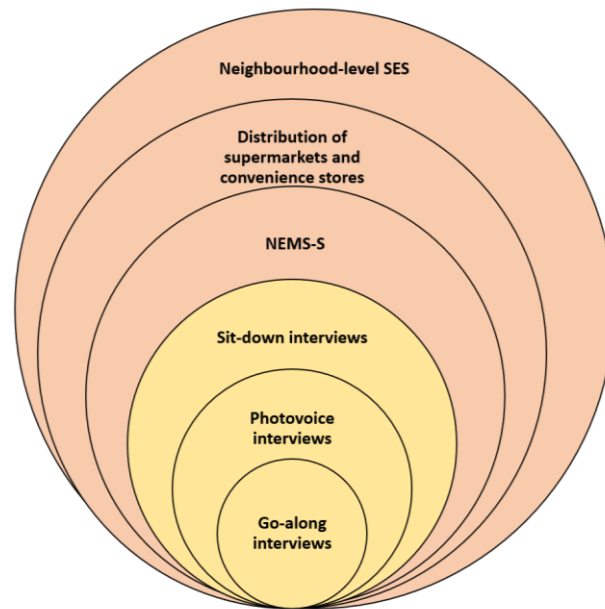


Figure 3.1: quan → QUAL study design

### 3.4 Theoretical Framing

*Experiences result in changes to both the people and the context in which they interact* (Kane & Pamphilon, 2015, p. 586).

This study is grounded in a constructivist epistemic foundation, an interpretive approach which posits that experiences and perceptions of the built FE are relationally and socially constructed. The best way to understand these experiences is to see it from the perspective of participants (Hessy-Biber & Leavy, 2011). “The individual is considered to be an active agent in the process of experiencing” (Mahoney & Granvold, 2005, p. 75). The personal FE, as a construct of experiences and perceptions (Green & Glanz, 2015), represents the highly subjective intersection of social, cultural, economic, political, structural, and normative perceptions that shape foodwork practices and built FEs. The personal FE is the subset of places that someone has chosen from all the places accessible to them in the built FE (Desjardins, 2010).

This study used a constructivist approach to compile composite experiences of personal FEs. Constructivism “emphasizes the dynamic structure of human experience and maintains that humans are active participants in their own lives. The choices that people make reflect their own lives and the lives of everyone with whom they are connected” (Mahoney & Granvold, 2005, p. 75). Personal FEs are social and experiential, local and specific, and dependent on the individuals’ meaning of these constructions (Carpiano & Daley, 2006). Constructivism emphasizes peoples’ relationships and social-symbolic systems, positing that people make new meanings as these relationships and systems develop (Mahoney & Granvold, 2005).

### 3.4.1 Theoretical influences

Interaction between structure and agency is a dynamic process where actions reproduce, maintain and change higher levels of structural organization (Schubert, Gallegos, Foley, & Harrison, 2011). With that understanding, the relationship between the built FE and health outcomes underscores the complexity of the biological, behavioral, and environmental factors involved (Egger & Swinburn, 1997). This study draws from Giddens’ structuration theory, as it has been applied to FE research, to further ground this constructivist retail reality (Giddens, 1983; Sadler, Gilliland, & Arku, 2015). Spaces and structures shape social practices and, inversely, practices create spaces and structures. Structuration theory embraces the complexity of structural inequalities to position structure and agency as distinct from, but co-creating, each other (Delormier, Frohlich, & Potvin, 2009). Structures shape social practices such as foodwork; accordingly, foodwork creates structures that influence the built FE. Structure and agency parallel each other through reflexive and recursive practices, underscoring their mutually-dependent relationship (Sadler et al., 2015). Central to structuration theory is the “knowledgeable, strategic and intention-driven social agent” (Slater et al., 2012, p. 412) who pursues objectives within the constraints and opportunities of environmental factors. The social agents of this study are mothers of adolescent children, and a constructivist-driven, structuration-informed approach was used to understand their perceptions and experiences of Saskatoon’s built FE.

### 3.6 Study setting: Saskatoon, SK

At the time of quantitative data collection (2011), four corporations operated the majority of supermarkets in the city: Loblaws, Co-op, Safeway and Sobeys. There were also several independent grocery stores, which were primarily located in older neighbourhoods of the city centre (Engler-Stringer et al., 2014). There were four hypermarkets at the time: Wholesale Club, two Superstores, and one Costco. All but Costco are store banners of Loblaws, and all but Costco – which is located in a non-residential neighbourhood - were accessible by public transit at the time of data collection. Wholesale Club and one of the Superstores were located in the same mid-SES neighbourhood. The other Superstore was located in a low SES neighbourhood. All three were accessible by public transit at the time. Despite three of the hypermarkets' location within residential neighbourhoods, they were situated along road networks of heavy traffic lanes (researcher observation).

### 3.7 Quantitative data collection

#### 3.7.1 NEMS-S In-store survey

The Nutrition Environment Measurement Survey for Stores (NEMS-S), is an in-store survey used to collect information about the price, availability and quality of specific foods. Based on national information on the Canadian diet, an adapted NEMS-S included a wider list of fruits and vegetables, such as the addition of yams based on the Canada Food Guide recommendation of consuming at least one orange fruit or vegetable per day. Canned and frozen produce items were expanded and, while there were more shelf-stable juice options added, the Canadian version removed frozen juice. There were fewer branded options since there were fewer brands in Canada than in the US, and measurement units were changed from gallons or quarts to litres (Buhler, 2010).

Inclusion and exclusion criteria of store types was adapted from the original NEMS-S study (Glanz et al., 2007). Stores met the inclusion criteria if they fell in to one of three categories: supermarket (chain stores of any size), convenience stores (stores attached to gas stations, convenience chain stores or big box stores whose primary offering wasn't food) and

specialty stores (bakeries, delis, ethnic grocers, health food stores, etc.). To be included in the study, the supermarket, convenience store or specialty store had to be located in one of 60 residential neighbourhoods. Stores outside of these neighbourhoods were not included. In keeping with the protocol of the original NEMS-S study, stores requiring membership were excluded, as were any stores not open to the general public. The latter were convenience stores within apartment buildings and only available to those residents.

Raters, including this researcher, attended two-day training in January 2011, in Saskatoon. The training was led by Dr. Sue Buhler, a University of Alberta research team member who adapted NEMS-S for the Canadian context (see Appendix D). Once a food outlet was confirmed to exist at the location listed in the directory from the City of Saskatoon or had been added manually by a rater through observation, it was assigned an 8-digit number. Digits represented the neighbourhood, food store type and a unique 3-digit identifier. In teams of two, the trained raters (including this researcher) completed the survey. When raters were questioned by store management about what they were doing, a letter was provided outlining the project and assuring management that results from the surveys were anonymous and not part of any market research (see Appendix E).

During data collection there was a mid-point check-in. The focus of the meeting was to ensure inter-rater reliability in every section of the survey. It was noted, for instance, that low fat meat could not be counted as a low-fat offering unless it was explicitly labelled as such (regardless of what was on the nutritional label). Assessments of produce quality were proving to be very subjective, as there was variation in what raters perceived as ‘good enough for sale.’ The team discussed their approach to assessing quality and went through specific examples to see how each rater would enter a response into the survey. While this discussion improved the objectivity of data collection, the decision was made to drop this construct from further analysis.

Responses on the completed hard copies of the NEMS-S surveys, including hand-written notes in the margins, were inputted into an Excel spreadsheet by a different rater. The survey and scoring sheet for NEMS-S can be found in Appendix D. Each indicator food listed in the survey used assessments of price and availability. A third assessment, quality, was also used for fresh produce. Quality was defined as at least 50% of the item displayed looking fresh enough for purchase. As noted above, there was disagreement among the raters as to what constituted ‘fresh enough for purchase,’ resulting in this assessment’s removal from further analysis.

### 3.7.2 Categorizing neighbourhoods into high, mid and low SES

Variables drawn from the Material-Social Deprivation Index (MSDI) were used to categorize neighbourhoods as low, mid and high SES. The conceptual underpinning of the MSDI - developed by Quebec's Ministry of Health and Social Services and Institute of Public Health - is that it demonstrates observable disadvantage of neighbourhoods relative to the wider city (Pampalon et al., 2009). The MSDI comprises material indicators (income, education, and employment) and social indicators (single parent status, marital status and living alone). The material component of the MSDI represents a lack of financial access to goods and amenities, while the Social component represents a fragility of social networks (Pampalon et al., 2012).

The original MSDI used principal component analysis to create index values. This present study draws from the same six derived variables but uses simplified z-score calculations to assign neighbourhoods into socioeconomic status (SES) categories. Data were drawn from the City of Saskatoon's neighbourhood census data (2006). Six proportions derived from this data were: (1) income below the neighbourhood median, (2) no high school diploma, (3) unemployed, (4) single parent status, (5) living alone and (6) unpartnered (single, widowed or divorced). These proportions were converted to z-scores and summed, creating a composite healthy food store score for each residential neighbourhood (n=60). Neighbourhoods were evenly divided by three - the twenty neighbourhoods with the highest scores were categorized as low SES, the next twenty were categorized as mid SES and the twenty neighbourhoods with the lowest score were categorized as high SES neighbourhoods (see Appendix B).

### 3.7.2 Developing the qualitative sampling frame

In order to recruit participants who reflected maximum variety of neighbourhood features, several attributes were taken into account: **SES** (high, mid or low), **NEMS-S scores** (high or low 'healthiness' of neighbourhood food stores), **Price F/V** (high or low cost of fruits and vegetables), **Convenience stores** (high or low density) and **Supermarkets** (high or low density). These attributes were then used at the beginning of the qualitative phase to characterize

neighbourhoods and create a maximize variation sampling frame for recruiting interview participants.

### 3.8 Qualitative data collection

Three sequential qualitative interviews were used to collect data in the second phase of the study. Sit-down interviews at participants' homes offered a familiar environment to reflect on foodwork and experiences with FEs. In the subsequent photovoice interviews (PVIs), participants guided the direction of the discussion through their explanations and reflections of the pictures they took. The interview guide was built on questions from semi-structured interviews, such as participants' perceptions of the best and worst places to buy food, both in their neighbourhood and Saskatoon overall. The final go-along interviews were the most dynamic of the three interview types, where the researcher accompanied participants on one of their 'usual' grocery shopping trips to their main grocery store, as was defined by that participant. The participants guided the researcher through the store, leading both the discussion and the routes that they took. The researcher's role was to observe and ask prompt questions when needed but, above all, to follow the lead of the experts. By witnessing foodwork in 'real time,' these go-along interviews offered the researcher visceral insight into participants' routines of practice.

#### 3.8.1 Sit down interviews

In the first of three interview types, a sit-down interview guide was developed by the research team to mirror the constructs of data collected in the earlier quantitative phase of the study, as well as to capture additional information of interest to the *Smart Cities, Healthy Kids* study. The interview guide contained perceptual questions of price, availability and accessibility of different store types, as well as broader foodwork questions of participants' approach to food provisioning within their household. The aim of the sit-down interviews was to get a 'big picture' sense of FE perceptions across neighbourhoods of varying SES and FE features, which would be later used to inform photovoice and go-along interviews. Sit-down interviews served as

the initial entry point for the researcher to understand foodwork among mothers of adolescent children, and gave the researcher a sense of how participants' perceptions compared to survey measures of their retail FE.

The sit-down interview guide was pilot-tested with two mothers who were not part of the study. The purpose of the pilot test was to ensure that the type, flow and number of questions were appropriate to the aims of the study. The final interview guide consisted of a mixture of closed- and open-ended questions about everyday routines related to foodwork, such as shopping and meal preparation, as well as other aspects of family food management and decision-making. Open-ended questions with probes such as, "Tell me more about that" or "Please explain that further" were used to elicit more details. (See Appendix F). Interviews were carried out at participants' homes and ranged from 45 to 90 minutes. Interviews were audio-taped and transcribed.

Sit-down interviews (n=27) began with broad questions of household demographics, (such as the age of occupants and employment of adults), their perceptions of neighbourhoods (what they liked and disliked about the neighbourhood that they lived in, which neighbourhood they would like to live in, and which neighbourhood they would not like to live in). Participants were then asked about stores that they currently shopped at, stores that they avoided and stores that they would like to shop at (that they didn't already shop at). When chain stores were named, the researcher confirmed the location with the participants by asking which road network intersection was closest.

Saturation in the data was noted by the eventual uniformity of responses to questions about main, preferred and avoided stores. The researcher also watched for similarities in foodwork, particularly how participants described cooking and shopping practices. For each main store that participants named, distances from that store to their home address were compared against the distance from their home to their *nearest* supermarket using Google Maps. The difference between these distances was used to assess how much further participants were willing to travel to access a store that they identified as a main store (or, in some cases, main stores).



### 3.8.2 Photovoice interviews

Qualitative data collection methods that actively engage participants can provide a more in-depth understanding of retail FE perspectives (Díez et al., 2017). Photovoice interviews (PVI) can help the researcher gain a more comprehensive understanding of how perceptions of the retail FE influence participants' decisions of where to shop and what to buy. PVI offer deeper data collection through place-based, visual prompts that encourage participants to reflect more critically on their foodwork experiences. PVI also provide a non-verbal opportunity for participants to identify and capture aspects of the retail FE that may be missed or under-discussed during sit-down interviews.

A sub-set of mothers who participated in semi-structured interviews were invited to participate in photovoice interviews (n=7). These participants represented variation in both SES and NEMS-S scores, but also variations in cooking and shopping patterns based on the foodwork practices they described in their sit-down interview. PVI were divided into two parts: an initial meeting to explain the photovoice interview guide, then an interview two weeks later to discuss the pictures taken. Participants had the option of using digital cameras provided by the researcher; all but one participant declined and preferred to use their phone. During the two weeks of picture-taking, the researcher checked in with participants via email and text messages to address any questions that they might have. Building on the semi-structured interview questions of *main*, *preferred* and *avoided* stores, PVI participants were asked to take pictures of stores they felt were the best and worst places to buy food, both in their neighbourhood and the city overall. They were also asked to take pictures that represented barriers and facilitators to eating healthy.

Once two weeks had passed, the researcher met with each participant individually to discuss the photos. Each participant's photos were downloaded onto the researcher's computer, and together they reviewed each picture one by one, with participants explaining what each picture was about and what prompted them to take it. These discussions were recorded and transcribed, and photos were assigned file names and sorted into folders (by question) to facilitate reference back to transcript data.

### 3.8.3 In-situ, go-along interviews

From the sample of mothers who participated in PVIs, and who represented variation in foodwork practices and neighbourhood-level SES, a smaller sub-set was invited to participate in a go-along interview (n=3). In these interviews, the researcher accompanied participants on what they described as an average or typical grocery shopping trip to their main food store. The researcher met participants either at the store or at their home, depending on what was most convenient for them. Each participant wore a microphone attached to a digital recorder that they carried in their pocket, and the researcher used a digital recorder app on her phone as a secondary audio backup. The use of the researcher's phone was less intrusive than holding up a second microphone near the participant, and also drew less attention from other shoppers in the store. These were important considerations to maintain a natural shopping environment.

Prior to each go-along interview, the participant was asked several preliminary questions about her choice of store and shopping time, what she planned to buy and how much she expected to spend. During the shopping trip, participants were asked to describe what they were buying and why, and to explain their navigation decisions as they moved through the store ("Give me a running monologue of what you're doing and why"). The go-along interview was supplemented by frequent questions from the researcher to clarify behaviours, such as, "Why did you skip that aisle?" or "Why do you prefer this brand?". These prompts were designed to interrogate repetitive and routine decisions (Thompson et al., 2013). At the end of the trip, participants were asked to reflect on what they bought and how much they spent. "Were you able to buy everything that you wanted to on this trip?" and "What are your thoughts on how much was spent on this trip?". During the interview and right after, field notes were recorded about observed behaviours, trajectories through the store and items that the participant discussed but did not buy. The audio from these interviews and field notes was transcribed verbatim.

### 3.9 Summary of data sources

Table 3.1 Quantitative and qualitative data sources

<b>Data source</b>	<b>Description</b>	<b>Strengths</b>	<b>Limitations</b>
City of Saskatoon census data	<p>Adapted from the Material-Social Deprivation Index (Pampalon et al., 2012), six variables were derived from census data to categorize neighbourhoods into high, mid and low SES</p> <p><u>Material</u></p> <ol style="list-style-type: none"> <li>1. Income</li> <li>2. Education</li> <li>3. Employment</li> </ol> <p><u>Social</u></p> <ol style="list-style-type: none"> <li>4. Marital status</li> <li>5. Lone parent</li> <li>6. Live alone</li> </ol>	<ul style="list-style-type: none"> <li>• Categorized area-level inequity and facilitated comparability with other studies using neighbourhood-level assessments of SES.</li> </ul>	<ul style="list-style-type: none"> <li>• Ecological fallacy of SES uniformity within neighbourhood boundaries.</li> <li>• Misses SES variables that may influence accessibility and affordability, such as vehicle ownership.</li> <li>• Deficits-based approach to characterizing neighbourhoods.</li> </ul>

NEMS-S	<p>In-store survey of 10 indicator foods measures:</p> <ol style="list-style-type: none"> <li>1. Price</li> <li>2. Availability</li> <li>3. Quality</li> </ol> <p><u>Indicator foods</u></p> <ol style="list-style-type: none"> <li>1. Fresh fruits and vegetables (F/V)</li> <li>2. Frozen F/V</li> <li>3. Canned F/V</li> <li>4. Ground beef</li> <li>5. Potato chips</li> <li>6. Juice</li> <li>7. Pop</li> <li>8. Muffins</li> <li>9. Hot dogs</li> <li>10. Bread</li> </ol>	<ul style="list-style-type: none"> <li>• Has been extensively validated and has been widely used in different FE measurement contexts.</li> <li>• Common usage facilitated comparability with similar FE assessments.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Quality</i> as a measure was very subjective and, after discussion with the research team, it was removed from analysis.</li> <li>• Choice of indicator foods are limited and may not be culturally appropriate in all contexts.</li> <li>• Cross-sectional nature limits assessments of change over time.</li> </ul>
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<p>Google Maps</p>	<p>Widely available geographic information system that displays distribution of food stores and distances between nodes.</p> <p>Nodes measured: distance between sit-down interview participants' home address and (1) nearest supermarket and (2) preferred supermarket.</p>	<ul style="list-style-type: none"> <li>• Easy to access and intuitive to use.</li> <li>• Able to calculate multiple routes and show distance and travel times for several modes of transportation.</li> </ul>	<ul style="list-style-type: none"> <li>• Accuracy may vary in less-populated, remote or rural areas.</li> </ul>
<p>Sit-down interviews</p>	<p>Semi-structured interview of foodwork practices:</p> <ol style="list-style-type: none"> <li>1. Shopping for food</li> <li>2. Preparing meals</li> <li>3. Perceptions of retail FEs (of both neighbourhood and city).</li> </ol>	<ul style="list-style-type: none"> <li>• Yielded rich descriptions of foodwork and retail FE.</li> <li>• Pilot-tested with two mothers and revised based on their feedback (shortening some questions or providing clarification for others).</li> </ul>	<ul style="list-style-type: none"> <li>• Respondent bias of answering questions to reflect 'good' foodwork.</li> <li>• Recall bias of what foods are occasionally or frequently consumed.</li> </ul>

<p>Photo-voice interviews</p>	<p>Participants were given a list of questions to answer through photos. All but one mother used her phone to take pictures (the other mother used the digital camera provided by the researcher). The interview had two parts:</p> <p>(1) Provision and discussion of interview questions, establishing the process and timelines;</p> <p>(2) Discussion of pictures taken by the participant. For each photo, the researcher asked:</p> <ul style="list-style-type: none"> <li>• What this picture is about?</li> <li>• Why did you take this picture?</li> <li>• What do you want me to know about this picture?</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity to collect non-verbal data that a traditional semi-structured might miss.</li> <li>• Strengthened participants' descriptions of their retail FE perceptions.</li> <li>• Relationship-building opportunity with participants.</li> </ul>	<ul style="list-style-type: none"> <li>• Didn't yield much new information compared to sit-down interviews.</li> <li>• Picture quality and composing photos was not discussed with participants, resulting in several out of focus or blurry photos.</li> </ul>
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Go-along interviews	The researcher accompanied participants on an ‘average’ grocery shopping trip. The participant wore a microphone and was asked to give a running monologue of what they were buying and where they were going within the store.	Participant-led. Rich data from an in-situ interview – both in terms of the environment and the foodwork under observation.	Participants’ comfort with the interviewer resulted in casual shopping trips which may not be reflective of how participants move through stores when not under observation.
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### 3.10 Managing data from multiple sources

There were six sources of data used in this study - neighbourhood-level socioeconomic indicators, NEMS-S surveys, geo-data of food store locations, sit-down interviews, photovoice interviews and go-along interviews - resulted in a mix of spreadsheets, transcripts, photos and field notes. There were several considerations for managing and analyzing so much data. Quantitative data was stored in Microsoft Excel and analyzed using SPSS 2.1. Results of analyses were presented as tables and graphs in Microsoft Word documents. Maps developed by *Smart Cities, Healthy Kids: Food Environment* were used to supplement the survey-based FE findings (Engler-Stringer et al., 2014). Transcripts of all interview types were created in Microsoft Word and imported into NVivo 11. Transcripts, photographs and field notes were filed in NVivo according to interview type.

Table 3.2: Store type classifications

Store type	Description
Big box convenience	A store that occupies a large tract of land and offers a wide range of items. Food is sold in these outlets but doesn't represent the primary offering.
Convenience store	A type of store either attached to a gas station, part of a free-standing chain or a big box store whose primary offering isn't food.
Hypermarket	A store that occupies a large tract of land and primarily offers food. Unlike supermarkets and grocery stores, hypermarkets offer a wide array of non-food items. Some hypermarkets require membership, others do not.
Independent grocery	Store whose primary offering is food but is not part of any chain of supermarkets.
Supermarket	Stores whose primary offering is food, and are part of a larger chain of stores, sometimes known as 'banners.'

### 3.11 Quantitative analysis

#### 3.11.1 SES and NEMS-S

Using SPSS 21.0, *t*-tests assessed differences in the geographic distribution of grocery and convenience stores across neighbourhood types. NEMS-S scores were used to calculate means of availability and price of the ten indicator foods, which were later parsed out by fruits and vegetables data. Based on the price per kilogram, or the price per item, of 32 fruits and



vegetables, values were calculated for stores above and below the mean of these items. Associations between the price and availability of fresh produce measures and SES were assessed using ANOVAs (F-tests) and correlation ( $r^2$ ). Significance was set at  $\alpha=0.05$ .

### 3.12 Qualitative analysis: nested interviews

A purposeful mix of deductive and inductive approaches was used to manage, reduce and analyze the qualitative data. A rolling analysis approach enabled sorting and organizing qualitative data as the transcript was prepared. Each store mentioned by participants was categorized into either *main*, *preferred* and *avoided* store. Content analysis of how participants described the stores within these categories was used to identify positive and negative retail FE attributes. These perceptions of stores were compared with quantitative characterizations of Consumer and Community FEs, examining objective and perceptual assessments of affordability and accessibility. All interview transcripts (sit-down, PVI and go-along) were re-read and descriptions of grocery shopping and cooking were coded using thematic analyses. PVI pictures were also re-reviewed to see if any salient foodwork issues had been missed. These analytic strands were inductively coded using Iterative Categorization, which can be used with “textual data that have been coded deductively (based on the researcher’s pre-existing hunches or theories about issues likely to be important within the data) and inductively (based on issues emerging as important from the data themselves)” (Neale, 2016, p. 1096).

In the next chapter (Results and Discussion) stores are mentioned by name in order to increase clarity about which stores participants are referring to, as well as provide continuity for the reader trying to keep track of which stores were favoured or avoided by participants.

### 3.13 Ensuring Study Rigour

This study addressed rigour through several means. Purposeful mixing of objective and subjective assessments reduced the errors or inaccuracies that relying on a single assessment of affordability or accessibility would have introduced. Go-along interviews offered an experiential,

in-situ means of data collection, transferring power from the researcher to the participant, where participants led the discussion and decided the routes that they walked. With this change in the research relationship's power balance, participants guided the researcher through their foodwork and retail FE perceptions. This allowed the researcher to observe and learn more about participants' real-time experiences in retail FE settings. Pictures and participant-led trips to the grocery store captured subjective influences less tangible to researchers. Combining qualitative interview data, such as these in-store observations, with quantitative survey data of these same spaces, offered place-based insight about where participants shopped and what they bought. Importantly, the integration of qualitative research methods captured lived experiences of retail FEs that quantitative assessments alone would have missed.

Relative assessments, such as perceptions of distance, were filtered through successive interview approaches, yielding data that was perhaps more true-to-life than if collected through a singular interview approach. Multiple interviews with the same pool of participants meant that participants had more than one opportunity to share their perspectives, allowing them to continually build on perspectives and experiences shared in the previous interview (Guest, 2013; Morse, 2012). This prolonged engagement also created trust between participants and the researcher, creating space for more personal and in-depth discussions.

From a more empirical perspective, the labour-intensive nature of research focused on depth (including, sometimes, "reflexivity") can be evoked to justify a small sample size, where in-depth interviewing is the method of choice and realism the epistemological foundation. Complex reactions and feelings are best given meaning and are optimally articulated through a dialogue which encourages reflection on, rather than mere reporting of experience (Crouch & Mckenzie, 2006, p.484).

### 3.14 Ethics approval

Ethics approval was obtained from the University of Saskatchewan's Behavioural Research Ethics Board (see Appendices A-1 and A-2). The first phase of the study, which focused solely on stores, received an ethics exemption. An ethics amendment was approved for the second phase of qualitative interviews. Consent forms were drafted by the research team and

were provided to all participants, accompanying a brief overview of the project, prior to the first interview. For each photovoice and go-along interview, consent was verbally revisited, though no additional forms were used. After the sit-down interview, participants were provided with copies of the transcript and were asked to review it within two weeks. Some participants revised sections for clarity, but no major changes were requested overall. Sit-down interview participants received a family day pass to a municipal leisure centre to thank them for their participation, and photovoice and go-along interview participants received a \$25 gift certificate to a chain cafe.

## Chapter 4: Results and Findings

### 4.1 Background

This penultimate chapter lays out the quantitative and qualitative results of this study. Geographic findings of food store density, diversity, and distribution describe the landscape of Saskatoon's retail FE. Absolute and relative measures – store counts and proportions, respectively – are presented, followed by results from the in-store survey tool (NEMS-S) to characterize price and availability within supermarkets. These quantitative findings are grouped into, and described as, Consumer and Community FEs attributes, which were incorporated into broader assessments of affordability and accessibility, respectively. A description is then provided of how quantitative results were used to create the stratified, maximum variation sampling frame used to recruit participants for the qualitative phase of the study. This sampling frame guided recruitment for sit-down interviews, and a simplified version of this sampling frame guided recruitment for subsequent PVIs and go-along interviews. Qualitative results are presented in the order that each interview approach was implemented. Foodwork descriptions of shopping and cooking are analyzed as perceptions of the retail FE alongside descriptions of positive and negative food store attributes. A selection of photovoice data is presented to complement findings from sit-down interviews. Lastly, go-along interview results are presented as three narratives of food shopping experiences. Each participant's story is contextualized by the foodwork that takes place within her personal FE.

This chapter concludes with a summary of the quantitative and qualitative findings across both phases of the study. The next and final chapter (Discussion and Conclusion), sequentially presents individual and combined analyses of affordability and accessibility within personal FEs, followed by reflections on this study's research design and changes to the field of FE research since beginning this dissertation.

## 4.2 Geographic characterization of the retail FE

A geo-coded list of 141 food stores was obtained from the City of Saskatoon. From this list, stores were categorized as either supermarkets (n=24), convenience stores (n=92) or specialty food stores (n=12). Specialty food stores were excluded from Consumer FE assessments because of the high in-store variability within this category (eg. bakeries, delis, health food stores, etc.), particularly fresh fruits and vegetables. However, specialty food stores remained in Community FE characterizations of store type proportions across neighbourhoods. Food stores located in non-residential neighbourhoods were excluded (n=13 stores) in both Consumer and Community FE assessments, as were stores requiring membership (n=1). This yielded a final sample of n=116 stores in this study. Analyses primarily focused on supermarkets because, at the time of this research, this food store type was assumed to carry the widest array of fresh fruits and vegetables (Inglis et al., 2009). Hypermarkets (n=3) were counted and measured as supermarkets and were included in the final count of 116. However, as a food store requiring membership, Costco was excluded in Consumer FE assessments.

### 4.2.1 Community food environment results

There were 17 supermarkets in the 60 residential neighbourhoods; two neighbourhoods (one low and one mid SES) had two supermarkets and one neighbourhood (high SES) had three. Table 4.1 indicates the distribution of food stores by neighbourhood type. Low SES neighbourhoods were found to have significantly more convenience stores (n=40) than mid (n=31) and high (n=21) SES neighbourhoods ( $p=0.052$ ). High SES neighbourhoods had a higher proportion of supermarkets (28.6%) than low or mid SES neighbourhoods (12% and 16%, respectively) when all food store types within the neighbourhood were accounted for ( $p=0.007$ ). In all neighbourhood types, convenience stores outnumbered all other store types, where the proportion of convenience stores in high, mid and low SES neighbourhoods was 60%, 76% and 73%, respectively. The ratio between supermarkets and convenience stores of 1:4. Put another way, three out of every four stores in a neighbourhood was likely to be a convenience store.

Table 4.1 Distribution of supermarkets and convenience stores

<b>Neighbourhoods</b>	<b>No. of food stores†</b>	<b>No. of supermarkets (% of total food stores)</b>	<b>No. of convenience stores (% of total food stores)</b>
All	131	24 (20.9)	92 (80)
High SES	35	10 (28.6)*	21 (60.0)
Mid SES	41	5 (12.19)	31 (75.6)
Low SES	55	9 (16.4)	40 (72.7) **

†Includes all supermarkets, convenience and specialty food stores, however, this analysis focuses solely on supermarkets and convenience stores. As such, percentages in the last two columns will not equal 100%.

\*p=0.007

\*\*p=0.052

#### 4.2.1 Consumer food environment results

NEMS-S was administered in 116 food stores (24 supermarkets and 92 convenience stores) between January and February 2011. Among the stores identified, all but one allowed the raters to complete the survey. This store was excluded from analyses of the Consumer FE but was counted in assessments of the Community FE. The owner of this store informed the raters that the prices were private and could not be recorded.

Overall, NEMS-S scores across supermarkets did not vary by neighbourhood-level SES, revealing no discernable difference in the price nor availability of healthy foods (See Table 4.2). Availability and price were then parsed out for fresh fruits and vegetables. This was because a diet high and fruit vegetable consumption is important for maintaining optimal health (Health Canada, 2013), therefore making it important to understand the affordability and accessibility of these particular foods. Mean price and mean availability (of all 17 supermarkets) were used to dichotomize stores as above or below the mean (or high and low, respectively). When parsed out this way, neighbourhood-level differences were detected. The proportion of supermarkets with high produce availability was greater than the proportion of supermarkets with low produce availability in all neighbourhood types, though these findings were not statistically significant (see Table 4.3). Supermarkets in high SES neighbourhoods were evenly divided in price

differences (high/low) of fresh fruits and vegetables (50% versus 50%, respectively). Supermarkets in mid SES neighbourhoods fared favourably (33% versus 67%, respectively), while low SES neighbourhoods did not (63% versus 37%, respectively;  $p=0.035$ ). See Tables 4.2 and 4.3. Within Saskatoon at the time of data collection, supermarket banners were one of four chains: Loblaws, Safeway, Sobeys and Co-op. Control by such a small group of companies is likely to mean little variation in supermarket diversity across the city. It is through this absence of supermarket diversity that Saskatoon's retail FE can be described as uniform. However, such uniformity would suggest consistency of in-store offerings and price; that is, there is an expectation that a chain supermarket would have the same prices across all their locations. The difference in price found in low SES neighbourhoods, when compared to mid and high SES neighbourhoods, suggest that such price consistency is not the case in Saskatoon.

Table 4.2 Produce price and availability

<b>Neighbourhoods</b>	<b>Produce Price (expensive, inexpensive)</b>	<b>Produce Availability (low, high)</b>
All	52.1%, 47.9%	52.2%, 47.8%
High SES	50%, 50%	40%, 60%
Mid SES	33.3%, 66.6%	40%, 60%
Low SES	62.5%, 37.3%	33.3%, 66.6%

Table 4.3 Produce access in supermarkets

		Price (F/V)	Availability (F/V)	Total NEMS-S
Neighbourhoods				
High SES	F	1.225	2.681	2.762
	r <sup>2</sup>	0.09	0.054	0.006
Mid SES	F	0.345	5.673	1.554
	r <sup>2</sup>	0.077	0.089	0.015
Low SES	F	6.244*	1.840	1.233
	r <sup>2</sup>	0.343**	0.064	0.032

( $\alpha=0.05$ )

\*p=0.035

\*\*p=0.023

#### 4.3 Perceptions of the retail food environment

Invitations were sent to 900 families who had participated in the Smart Cities Healthy Kids: Food Environment. Forty-three people agreed to be contacted for the study. After screening for inclusion criteria, four people were excluded as they did not live in one of the 60 target neighbourhoods. The remaining 39 participants were divided as much as possible by characteristics noted in Table 4.4 and 4.5. When these 39 participants were contacted, a final sample of 27 mothers agreed to participate in sit-down interviews. Of these participants, 11 lived in a high SES neighbourhood, 8 lived in a mid SES neighbourhood and 8 lived in a low SES neighbourhood. Among all participants, 14 lived in a neighbourhood with a grocery store and 13 lived a neighbourhood without a grocery store.



#### 4.3.1 Changes to Saskatoon's retail landscape

Since beginning this study, several stores have closed and others have opened. Some stores that were measured in the first phase, or named in the second phase, do not exist anymore. Two of the most notable closures are (1) Shop Easy, a Loblaws banner store that was located downtown in a mid SES neighbourhood, and (2) the Good Food Junction, a community grocery store that was located in a low SES neighbourhood. The former was the last grocery store serving Saskatoon's downtown and central neighbourhoods. The latter was a community cooperative that was designed to meet the needs of residents in a cluster of severely food insecure neighbourhoods (Abeykoon, Engler-Stringer, & Muhajarine, 2017; Lotoski, Engler-Stringer, & Muhajarine, 2015). Both stores were in central, older neighbourhoods of the city.

The reader will notice that *grocery shopping* and *food shopping* are used interchangeably in the remainder of this dissertation. The former term was used by participants and the latter term is often used in FE literature. Since participants used the word *groceries* to describe what they purchased on shopping trips, it is incorporated into the write up of results and discussions to reflect participants' own descriptions of their personal FE. Each participant is referred to by a pseudonym and data has been anonymized. Some quotes have been edited slightly for clarity but are otherwise unchanged.

#### 4.3.2 Sit-Down Interviews (n=27)

The majority of participants (48%) had two children, 18% had one child, 15% had three children and 15% had four or more children (up to a maximum of six). Most participants were married (82%), worked in a salaried job outside of the home (74%) and lived in a neighbourhood with at least one convenience store (67%). There were supermarkets in 30% of participants' neighbourhood, with 10% living within 1 km of a supermarket. It was challenging to recruit mothers who did not drive or own a vehicle, resulting in 96% of participants owning a personal vehicle (n=26). It is also worth noting that all but one participant owned their home, and that this was the same person who did not own a vehicle.

All but two participants used their vehicle as their primary mode of transportation for grocery shopping, and none mentioned sharing their vehicle with another person. Based on

where participants did most of their shopping (their main store(s)), they traveled an average of 2.4 km further than the grocery store nearest to their home to do their regular grocery shopping. Eight of the 26 participants (31%) shopped regularly at the supermarket closest to their home, almost always driving there on their way home from work. The greatest distance traveled on a regular basis by any participant was 11.6 km, who shopped at Costco weekly.

Two participants did not drive - one did not own a vehicle and one did not drive for health reasons. In the case of the latter, however, her husband owned a vehicle and drove for their large weekly grocery shopping trip. The participant who did not own a vehicle shopped at Giant Tiger, a big box convenience store that was 950m further than her nearest grocery store. She preferred Superstore, “but it’s hard to get to unless I have a ride.” She coordinated her monthly shopping trips to Superstore with her parents, who owned a van and lived next door. Trips were scheduled at the beginning of the month when she received social assistance. The rest of the month she used public transit, walked or took a taxi. The other participant who didn’t drive preferred to shop at Costco, which was nearly 6 km further than her closest grocery store. For the purposes of this analysis, the participant who did not drive for health reasons was considered as having a vehicle since - based on her interview responses - she was the one who decided when and how often they shopped for food, and her husband drove them for these grocery shopping trips. She did occasionally walk to a nearby food store (800 m from her home) throughout the week to pick up a few items.

If it’s not blizzardly cold, it’s easy enough to pack up my youngest boy and just walk over there, because it’s not that far and I don’t mind the walk. I actually enjoy it. If I was knowing that I was going to take more stuff out, I’ll just take our wagon with us. If it is cold, however, that is a deterrent to walking to the store. The only thing I find challenging to walk to the grocery store is bad weather.

Among all participants, very few said that they would walk to the supermarket. Winter weather conditions, such as snow and ice, were frequently mentioned as deterrents to active transport, as exemplified in the above quote, “The only thing I find challenging to walk to the grocery store is bad weather.” This was also true for driving. Participants spoke of the added stress that driving in the winter brought, such as warming up vehicles, scraping off snow, navigating slippery roads and pushing grocery carts across slushy parking lots. In addition to unfavourable weather conditions, though, participants living in a neighbourhood with a

supermarket (n=11) cited not having enough time for active transport, further describing the difficulty of carrying many groceries home on foot or by bike. As one participant living in a low SES neighbourhood said,

I don't mind carrying 1 or 2 smaller bags, but if I want to have anything big, like flour or dog food, anything like that in big packages? I would drive, because it's hard enough just to get it out of your grocery basket.

Even among those who have walked to their neighbourhood supermarket from their current residence, few were keen to do so regularly. One participant living in a mid SES neighbourhood, whose nearest store was 1.2 km from her home, explained it thus,

To shop at Safeway, you couldn't really walk that and carry much of anything back. I mean, it would be a fair undertaking. It doesn't seem that far but then, down that whole 8<sup>th</sup> Street strip, it actually feels quite far. I have walked it, but it's not something I would commonly do to get groceries.

She articulated that walking, besides being inconvenient, changed her perceptions of distance ("It doesn't seem that far but then ... it actually feels quite far"). One participant living in a mid SES neighbourhood said, "There is a little bit of heavy traffic. I would have no problem walking or biking. I just don't." Later in the interview, she described how she worked all day and spent her evenings ferrying her children to after-school activities. "It's just easiest to drive to the supermarket."

Overall, neither walking nor biking to the supermarket were options preferred by participants, even when supermarkets were within 1 km of their home. A participant living in a mid-SES neighbourhood described the challenge of walking to the supermarket as follows,

Sometimes we walk to the Extra Foods here. The other one is way too far, but we go through a lot of milk. If we're getting two 4 litre things of milk, it's a bit. It's 2.2 km from my front door; I know that because we walk it. Yeah, 2.2 is quite a bit, so that becomes 4.4... it's almost a 5 km walk with groceries for half of it back. But, no, we enjoy that in the summer. We do a loop down by the river.

All participants described the importance of time within their foodwork, and they spoke of not having enough time as well as how they allocated the time that they had. The absence of time was consistently named as a challenge for eating healthy, as many participants spoke of not having enough time to grocery shop or cook healthy food. The latter was particularly challenging

because, while participants could try to fit in grocery shopping while driving between locations that, it was much harder to reschedule cooking within their weekday schedules. Participants described how they allocated their time for shopping and cooking based on the demands of their changing schedules, revealing constant planning and decision-making to make efficient use of the time available. Making efficient use of time was a strong influence of where participants chose to shop.

Four participants used the exact same phrase when describing why they wanted to complete their shopping as quickly as possible: “I’d rather be sitting under a blanket.” In each case, participants were describing their approach to grocery shopping in the winter months, when they tried to avoid spending time outside. For instance, many spoke of buying more groceries per trip to reduce the overall number of times that they had to go grocery shopping. Conversely, when describing grocery shopping practices in the summer months, participants spoke of buying less food. This was mainly because their children were not in school and thus did not require lunches or snacks to pack every day. While participants did not explicitly mention shopping more often, they did mention cooking more fresh food and trying to eat foods that were in season. Since the shelf life of vegetables varies, it is likely that participants shopped more often based on their descriptions of how seasons affected their cooking.

Scarcity of time was cited by all participants as a challenge to eating healthy and a challenge for grocery shopping. The resource of time was described explicitly by participants living in high SES neighbourhoods but was mentioned numerous times by participants across all neighbourhood types. Many had children who were registered for several afterschool activities, resulting in much shuttling between locations. Often, participants purchased ready-made food on the way to or from activities, or they had prepared food for children to eat during the car ride to their activity. Tim Hortons, a chain donut shop that offers a range of soups and sandwiches, was mentioned many times by participants. They perceived Tim Hortons to be the healthiest option of fast food available to them.

Further related to the paucity of time, participants struggled to fit food shopping within their already-constrained schedules. A participant living in a high SES neighbourhood summed it up thus, “It takes up time. My husband works, I work, and the kids are in school. People have busy lives and it [grocery shopping] takes up time. I’d rather use that time for food preparation because I like to cook.” Spending less time shopping freed up time for other foodwork, and also

meant that less time was spent travelling to food stores. Participants favoured supermarkets that were located along, or near to, the road networks that they frequently used, describing the location of these stores as, “Where I was going to go, anyway.” This meant that participants considered store locations in relation to their routes between home, work, their children’s school, their children’s activities, and any other spaces that participants were “going to go, anyway.” A participant living in a high SES neighbourhood summarized it as follows,

I shop at Safeway near the school because if I’m dropping off or picking up the kids and I have to swing by, it’s quick and convenient. I would say I also shop at Safeway down the street, just because of convenience. There’s also Shoppers Drug Mart. It’s just a convenience thing. It’s right there. Usually, I can hit it if I know I’m running low on something. I can swing by and pick something up.

Another participant living in a high SES neighbourhood expressed it thus, “I like it that the store is on the corner of where I turn to come home, and that it’s a right-hand turn. We’re really busy and it just makes things that much less stressful.”

There were mixed feelings about whether a neighbourhood grocery store or supermarket was essential. “Would it be mandatory? No. But is it convenient? Definitely. But I’m out and about enough that if we didn’t have one in our neighbourhood, well, then I would just find one along the way,” said a participant living in a high SES neighbourhood. She knows that there are other supermarkets along routes that she frequently travels, and her schedule and budget are flexible enough that she can shop based on convenience. Another participant living in a high SES neighbourhood said, “I guess it’s handy. It’s convenient, but I wouldn’t want it too... too far away. But I could cope with it if it was a further distance than what we have. We could manage if it was further.” Like the previous participant, her comments reveal the advantage of vehicle ownership combined with financial flexibility: she can travel further to find a supermarket, and she can afford to shop at the supermarkets that she finds. Many participants living in low SES neighbourhoods indicated that a local store would be convenient, but spoke of driving there, nevertheless. Said one participant, “To me, even to cross the city, it’s like twenty minutes. It’s not like Vancouver or anything. We usually plan it, like on outings to do other things, too.”

Conversely, a participant from a mid-SES neighbourhood said,

I think it’s really important, even if it’s a small grocery store. It’s important that people who, for example, want to get something quickly, don’t have to think about immediately jumping in a vehicle, fighting traffic and all

those sorts of things. I think it's really important to have access to food for everyone and people that maybe don't have access to a private vehicle or people with mobility issues to be able to shop in their own neighbourhood. And I think it adds a lot to a neighbourhood to have a food store in the neighbourhood. It's something that shouldn't be looked upon as a privilege - it should be a right to have access to fresh food when you need it.

Some mentioned that "it would be nice" to have a supermarket in their neighbourhood, both for the convenience of purchasing "last-minute" items and when a vehicle is not available for them to use. Participants conceded that they would feel more strongly about having a grocery store nearby if they didn't own a vehicle. However, many participants pointed out that a local grocery store isn't necessarily an affordable grocery store. As noted by the participant living in a low SES neighbourhood who didn't own a vehicle, "My neighbourhood grocery store is close by, but I don't shop there much, usually only if I need a jug of milk. I find their prices too high." A participant living in a mid SES neighbourhood had a small chain supermarket within 1 km of her home but avoided it. "We'll hit Shoppers Drug Mart right at the corner if we need milk because they've got cheaper milk than the Shop Easy down at the other corner. Under duress I'll go to Shop Easy. I try not to, because I find that their prices are just beyond horrific." Her comment conveyed how much she disliked her neighbourhood grocery store and would rather shop at a big box convenience store like Shoppers Drug Mart when she needed a few items.

Describing store choice as a function of her schedule, one participant living in a high SES neighbourhood said, "I would stop at Co-op sometimes because it's on my way to and from work, or Safeway, just because it's sort of on the way home from work if I have to pick up a few quick things." Another participant, also living in a high SES neighbourhood, described it thus,

I have certain places I go for certain things. For quick everyday things, I will just run to Sobeys because they're close. But I like to buy my produce at Safeway. I have certain items that I can only buy at Dad's Organic. Sometimes I go to the Farmers' Market. Sometimes I go to Superstore, but hardly ever... but sometimes there will be certain things that they have there.

Many participants regularly shopped at different stores, though they were often able to name one or two stores that they shopped at most often. For three participants, all living in mid SES neighbourhoods, several stores were named as their main store. The following quote illustrates the foodwork decisions that influence where she shops:

I'm not really very loyal to any store. I go to all of them, I would say. I'm kind of all over the map. Once every six weeks I go to Costco. I'll go out and buy a whole bunch of staples out there, we do non-perishables - we have dishwasher soap now for a year now. We do Safeway, Sobeys and Superstore. We do a lot of stuff. Like, on my list this afternoon, I really like cooking international foods, so Swadesh (independent Asian grocer) is a favourite and sometimes I go if I am swinging back from Costco. We were at the Farmer's Market this morning. There's another store I like the An An Market, Chinese-focused, on 20<sup>th</sup> Street that we go to. There's Pardessi (independent Asian grocer), on 8<sup>th</sup> Street, that we go to when we go to Sobeys. We're not very loyal to anything, but sometimes it's a matter of convenience.

There were mixed feelings about store loyalty. A participant living in a high SES neighbourhood said,

I don't have necessarily a loyalty to any particular store. I usually try to have a loose plan in my head when I'm doing my errands, where I'm going to be in my car that day and if there is a store in that neighbourhood I will stop by. For example, today I was out in one of the suburbs, and so I did all my errands there. I stopped at Sobeys when I was there but, if I had to say which store I normally shop at, I normally shop at Safeway. But I'm not stuck on it.

#### 4.3.2.1 The labour of foodwork

The term *foodwork* serves as a catch-all for the visible and invisible labour of provisioning food for oneself and for others (Davis et al., 2018; Parsons, 2016; Wright et al., 2015). Participants described a spectrum of explicit and implicit foodwork. The following quote from a participant in a mid SES neighbourhood exemplifies this mix, making evident the complicated nature of foodwork.

Usually the flyers arrived a day or two before that so I've kind of flipped through the flyer and just sort of made mental notes if there's any buy-one-get-one free things that we need. Sometimes I kind of take a quick look through the cupboard, I get in my head what I'm thinking for meal preparation for the week. Some nights need to be quicker dinners because we've got lessons and different things going on and so I know that it needs to be something that can be put together fairly quickly. I don't make a list, I just sort of do it in my head. Then we drive to the Safeway at Lawson and we usually start out in the produce section and just pick up any of those like I said. Citrus we usually need, limes and lemons, maybe shallots. Or

bagged salads, we do buy those periodically just for convenience sake, the ones with the dressing and everything in them. Then up and down the aisles fairly quickly, we tend to avoid the snack aisle if possible like the chips and pops because it's not... unless it's for buying stuff for a treat which we do once in a while, but on a general rule we tend to just skip those aisles. I try to follow the rule as much as possible. The outside aisles are the ones that you try to purchase the most from but of course, I mean things like canned vegetables and tomatoes and spaghetti sauce. And, like I said, the school snacks, the Granola bars and stuff like that. So, it usually takes no more than a half an hour. We just get in and get out, and that's it."

A great deal of foodwork is embedded within her description of grocery shopping, which had become so routine that, "I just sort of do it in my head." Her work began well in advance of the trip as she assessed which foods she already had and what each household member's schedule was, using this information to decide which days were suitable for grocery shopping and cooking, and which days required rushed meals. To these decisions she added consistent price monitoring, scanning flyers and identifying time-bound opportunities to save money. Once she decided where to shop, on which day and at what time, she described moving through the store with expert navigation, balancing what she knew her family would eat – at home and at school - with strategies to provide healthy meals. These decisions and actions belied a tremendous amount of new and existing information that she continually managed and integrated into her foodwork. And yet, "It usually takes no more than a half an hour. We just get in and get out, and that's it."

Nearly all participants cited the cost of regularly purchased items as a significant influence on which stores they frequented, or which stores they avoided. However, participants' perceptions of price were highly variable and highly subjective. As expressed by one participant living in a low SES neighbourhood,

We like Safeway. I like their prices. I don't find them to be that much more expensive for the things that we purchase and when they do have sales on - they do a lot buy-one-get-one-free and things like that - I usually watch the fliers for those.

However, discussing *the exact same store*, another participant living in a high SES neighbourhood said,

I used to go to Safeway a lot more, but I find their prices high. Then other members of the family started going more to Superstore, so I started going over there, too, since we got some money off gas. That was a help.



As both quotes illustrate, sales promotions and discounts influence perceptions of price. A participant living in a mid SES neighbourhood said, “One of the reasons I like Superstore is the points. You can get the cash back and it’s better than anywhere. Even at Costco, I have a membership and I use it mostly for gas.” These quotes illustrate the positive influence of sales promotions (buy-one-get-one-free and discounts on gasoline) on perceptions of a store’s overall affordability. Promotions, discounts and other bonuses were taken into consideration when defining what was good value for her household food budget.

Participants’ perceptions of price were not fixed, meaning that their perceptions were temporal, and changed over seasons and their life course. The extent to which participants actively and explicitly compared prices across stores, and within each shopping trip, varied. What was clear, however, was that price comparisons, and therefore ongoing price monitoring, were implicitly embedded in their food purchasing decisions. Said one participant living in a mid SES neighbourhood,

Well, probably Superstore now would have to be the one I go to mostly. And before that I always went to Safeway. I mean, not always, the odd time I’d go to Sobeys, but I found that you had to really know your prices there. When they’d have a sale, I’d get things that I felt were on sale but, too often, the prices are too high, and I just can’t afford it. So, I still do the same thing when they have sales, or if there are specific things that I like. I will go in and get those specific things but, otherwise, I have to go someplace where I can get things at a better price.

Also reflecting on Superstore, a participant living in a high SES neighbourhood said,

I would never buy beef tenderloin individually at a store, it’s way too expensive, but at Superstore I can buy the whole thing. It’s about \$80.00 but I can get several steaks out of one loin plus a roast and stew meat at the end. So, I get many meals out of that. It’s not going to be cheaper but it’s more reasonable and I still get a better cut of meat and same with their chicken and their pork tenderloin and all that, I could buy in bigger packages, I cut it to what I want and then I just put it in zip lock bags and freeze it, that’s why.

A perception that influenced which stores people liked was the atmosphere inside the store. Where the in-store atmosphere was perceived as quiet or clean, or where participants perceived the staff to be helpful, these were considered positive attributes. As one participant living in a high SES neighbourhood said, “If you think about price, I do find that Safeway and Co-op are

more expensive. But sometimes I just prefer the experience of those grocery stores.” Similarly, participants said that familiarity with the layout of the store – knowing exactly where regularly-purchased items were located and feeling like the store could be navigated with ease - was a positive attribute. Quiet atmospheres, clean aisles, tidy displays and helpful staff were all in-store qualities that were deemed positive attributes.

I like their [Safeway] prices, I don't find them to be that much more expensive for the things that we purchase and when they do have sales on, I am a sales shopper somewhat, so they do a lot of buy one get one free and things like that. I usually watch the fliers for those that I can stock up on some of the products that we like to have.

The attributes described above were cited as reasons for supermarket preferences. The ease with which participants felt that they can navigate the in-store environment was described as reducing stress - a sentiment that came up repeatedly across all levels of SES. As a corollary, negative attributes identified were a lack of cleanliness, unfamiliarity with the layout of the store (where the location of their regularly purchased items kept changing) and unhelpful or unavailable staff. Participants associated negative attributes with higher levels of stress. A participant living in a mid SES neighbourhood described Superstore, a store that she avoided, as “Too big, too stressful. Even if you could find the staff, they're not very helpful.” Negative attributes seemed to be a more influential determinant of store choice than positive attributes, regardless of SES. The sit-down interview findings suggested that the push of negative attributes was stronger than the pull of positive attributes, even where participants acknowledged that prices were lower at a store that they avoided.

When describing which stores they avoided, many participants named Superstore, a hypermarket with two locations in the city (in a low SES and a mid SES neighbourhood). As noted above, many participants described Superstore as too big, making it too difficult to find items. One participant living in a mid SES neighbourhood described the in-store experience as frenzied.

I tend to avoid Superstore just because I find it's too busy and too big and I hate checking out through there. I find that they just try to shove you through as fast as possible and I feel kind of stressed. I'm trying to pack stuff quickly and so I don't find it really a pleasant experience.

Some participants said that even though they shopped at Superstore (the mid-SES neighbourhood location was most frequently named), they would readily shop elsewhere under different financial circumstances. Said one participant living in a low SES neighbourhood:

My favourite store still would probably be Safeway, but their prices are quite often higher, too. So, over the years, I've gone more and more to Superstore (which she refers to by its former name, SuperValu). I have to say Safeway was always was my most favourite store. They seem to be a lot more friendly, always a little bit more customer friendly. It was nice to go in there, they were always wanting to know if you found everything you were wanting, or if they could help you with anything. And so that service part was always the drawing part (sic). I always like to go back but, unfortunately, their prices are often higher.

As one participant living in a high SES neighbourhood said,

Well, I avoid Superstore because it's always crazy in there. Like it's crazy to get up and down the aisles because it's always crazy, there's never anyone to help you. Safeway, there's always somebody to help you. They'll actually walk you right to the product. At Superstore, you can't find anyone. They hide in the back. And when you get to the checkout, you have to pack your own groceries. When my kids were small... you've got two screaming toddlers in the cart and you're trying to pack groceries and they push you through so fast they already start going through the next order before you're packed up. And at Safeway they pack your groceries for you, it's calm, they'll even help you to your car with it.

For some, a main or preferred store was not just about affordability and availability, but also about signalling their personal identity. These participants favoured stores that represented their values as consumers.

Well my main store is Co-op, we're real Co-op people. We became Co-op members as soon as we moved to Saskatoon. I like the whole philosophy of Co-op, the fact that we're members and we get money back at the end of the year. People always say, "Well, Co-op is more expensive." Of course, it depends on what you buy, too. And then, when we retire, we'll get money back as well. I like the philosophy and I think the Co-op here really tries hard to get really good things like high quality meat, local fruits and vegetables; lots of local products so I like that too.

Another participant living in a high SES neighbourhood said,

Probably Co-op is my favourite. Just because I feel the quality of the produce that they have is really good for a grocery store. I feel like they

do bring in local things for their produce department. I focus on the produce probably because I shop there for the produce.

Describing a store that she would like to shop, a participant living in a low SES neighbourhood explained,

It's not as busy. It just... Co-op feels homely there. It's just a different feeling, that store. I think the people are friendlier and the line ups are fewer. There are less people there. The quality of food, I think, is just as good, if not better, than some places.

Overall, participant responses were very similar in how they described positive and negative store attributes. Positive attributes could be summarized as lower prices, better value, consistent availability of regularly purchased items, favourable parking conditions and being familiar with the store layout. Stores with these attributes were additionally favoured when they were located near or within routes to other destinations ("It's on the way home"). Stores that participants preferred to shop at -which wasn't necessarily the same as their main store - had additional positive attributes that related to the sensorial experience of shopping there. These positive attributes included clean aisles, visually appealing and well-maintained displays, an array of local and organic foods to choose from, few or no crowds, and friendly staff. Negative attributes, those used to describe stores that participants avoided, included higher prices for regularly purchased items, lower value for items offered overall, poor selection of regularly-purchased items, dirty or unkempt aisles, crowds and hectic environments, and unhelpful or hard-to-find staff.

#### 4.3.2.1 Grocery shopping in hypermarkets: a contrast in experiences

As described in the previous section, Superstore came up often among participants when talking about positive and negative store attributes. Even among participants who named Superstore as their main store, there was a wide range of experiences, with some saying that they would shop elsewhere if they could afford it. These variations are illustrated in the contrast of experiences described below. These narratives describe retail FE experiences at two locations of Superstore, one in a mid-SES neighbourhood and the other in a low SES neighbourhood.

Sarah is a mother of one who lives in a mid SES neighbourhood. Cristina is a mother of four who lives in a low SES neighbourhood. Sarah and Cristina identify Superstore as their main food store, meaning that they buy the majority of their staple items from this store. They shop at different locations of this hypermarket. Sarah and her husband have one son, who is eleven years old. At the time of the interview, her family was also billeting a junior league hockey player. Both Sarah and her husband work full time outside of the home, and they each own a vehicle. Cristina's household is made up of herself, her partner and four children (ranging from six months to 18 years old). During the summer months, two of her nephews stay with her. She also has family that stays with her over the Christmas holidays. Cristina is the sole source of income in the household and no one owns a car. At the time of the interview, she was on maternity leave.

Both Sarah and Cristina are the nutritional guardians in their home: they do the vast majority of foodwork among everyone in the family. Sarah named the Superstore located in a mid-SES neighbourhood (Superstore A), and Cristina named the Superstore located in a low-SES neighbourhood (Superstore B), as their main store. This hypermarket chain, in addition to a full range grocery store, includes a pharmacy, photo development centre, eye wear and a large range of clothing, small appliances and other non-food household items. Both Sarah and Cristina have other grocery stores near their home, but they buy the majority of their groceries at Superstore. Superstore A is 2.2 km from Sarah's home. She usually drives there, though she walks on occasion, when she wants to walk the dog or get exercise. Conversely, Cristina has a small full-service grocery store 650m from her house but travels 3.9 km further than this store to do her large monthly shopping trip at Superstore B.

### *Sarah's experience*

Each week, Sarah does the majority of her grocery shopping at Superstore A, with a few occasional "top up" trips to other stores. She has named this hypermarket as her main food store because she feels that she can get her usual roster of purchases at the lowest prices compared to other supermarkets. Superstore offers occasional bonuses (such as a free item with purchases over a certain amount), which she describes as one of the biggest benefits to shopping there. In between shopping trips to this hypermarket, she shops at Sobeys, "Just because I work across the street." She goes on to say, "And not even for groceries, like, the little things. If I don't want to do it on the way home, I'll do it at lunch. Take a walk there." She sometimes shops at Costco,

located at the edge of the city (for seasonal and holiday-related items), and occasionally at specialty food outlets such as the Farmers Market or Bulk Cheese Warehouse, a boutique deli. Though she usually drives to her main food store, Sarah sometimes walks because, “I have to take the dog for a walk, so I might as well go to the grocery store and get what I need that way. The fact that I’m constantly 30 pounds overweight helps. I always think I should walk somewhere rather than drive.” She describes her food shopping decision-making as a balance of health (“My family hates me for not buying white bread or white buns, but it’s for their own good”), value for her money (“I knew I could get a lot more groceries for \$250 at Superstore than at Costco”), and convenience (“It’s not favourable to go after work, I just am too tired when I get home. So, Saturday morning or Sunday morning would be good”). Like most mid and high SES participants who participated in this study, time and her family’s schedule influences when she shops for food and what she cooks.

#### *Cristina’s experience*

Cristina does most of her food shopping at the beginning of the month, when she receives her monthly income, at the other location of Superstore in a low SES neighbourhood. Cristina frequents other stores in her neighbourhood in-between these large trips, but she prefers to do the bulk of her grocery shopping at this hypermarket. “Their prices are pretty consistent, it’s just depends on when you go shopping there. I found that they tend to put the prices up around pay days or cheque days, so then your grocery bill is more than it should be. I try to avoid it when the prices go up; I may end up having to wait a day or two to go grocery shopping. Once I unpack everything [at home], I check it off of my receipt just to make sure I have it and didn’t get overcharged or whatever.” She coordinates this large monthly shopping trip with her parents (who live next door), or with other friends or family members who have access to a vehicle.

In-between the big monthly shopping trips, she walks to Giant Tiger, a big-box convenience which carries a limited range of grocery options, every other week or so. Cristina’s three younger children, aged 6 months to 12 years old, often accompany her on these trips. Giant Tiger is 1.6 km away but, at the time of the interview, there was a grocery store 950 metres from her home. The Good Food Junction was a grocery store that was established to address the nutritional needs of people living in lower income neighbourhoods in Saskatoon’s inner city, which have long been considered food deserts (Cushon, Creighton, Kershaw, Marko, &

Markham, 2013; Lemstra & Neudorf, 2008; Lotoski et al., 2015). “Good Food Junction just opened, but I don’t know how often I’ll be going there. The prices are little steep for some things.” Three years after opening, the grocery store closed due to low sales. Cristina occasionally takes the bus to Superstore B or another supermarket “or get a ride if I find I have too much to go on the bus with.” She said that she would like to shop at Co-op, as she finds the variety and quality to be much better than Superstore B but does not shop there because of the distance to the store and higher prices.

The stories of Sarah and Cristina – the juxtaposition of their perceptions and experiences of their retail food landscape – illustrates how homogenous-seeming retail FEs can vary widely in perception by different people. Of note is that another participant, who lives in the same neighbourhood as Cristina, did not find the community grocery store expensive. “Maybe it’s a bit more expensive, but I don’t think so. I think it’s pretty reasonable compared to other places.”

#### 4.3.2.2 The labour of foodwork

In this study, participants in all categories of SES mentioned relying on some form of convenience food, which they described as “pre-made,” “instant meals” or “heat and serve.” For instance, a mother in a high SES neighbourhood, when describing the hectic after-school schedules of her children, said she alternated between relying on sandwiches from Tim Horton’s or foods they could cook at home quickly, such as grilled cheese sandwiches and heating up cans of soup. Her response implied that, if her children did not have these after-school activities, they would be eating foods that she deemed more nutritious. Hers was a common refrain – participants had to choose between buying pre-made foods to provide dinner before activities, or eating later at night (9 pm onward) once the children had returned home. Participants expressed conflicting feelings between the time-consuming challenge of providing healthful foods for their children under such constrained schedules, and the convenience of prepared foods to ensure that their children were eating enough and at what they felt was a reasonable time. Among those buying pre-made foods during weeknights, they were very clear that they were not going to places that they considered to be fast food outlets, where participants’ descriptions of such outlets ranged from “unhealthy” to “disgusting.” From participants’ description of the offerings

at Tim Horton's, it was clear that they perceived this as inherently healthier than the food available at other fast food outlets. Though I did not probe this line of questioning further, it seemed that Tim Horton's was acceptable form of convenience food. Only one participant, who lived in a low SES neighbourhood, spoke explicitly of buying fast food on a semi-regular basis. When she needed to bring her children grocery shopping with her, they stopped for fast food beforehand. She reasoned that it was an affordable way to reduce the demands her hungry children would make in supermarkets. She relied on this strategy, saying that "spending a little on fast food means saving a lot of money at the grocery store." Where participants had to bring their children to the supermarket, they regularly mentioned the challenge of managing requests for food, often food that participants felt were unhealthy. A single parent living in a low SES neighbourhood asked her children to use a calculator as they shopped, to add up the price of each item added to the cart and see the total cost of food that they ate on a regular basis. She felt that this activity helped her children to understand the value of her paycheque, and how quickly money was spent each week. Several participants in mid and high SES neighbourhoods spoke of taking their children grocery shopping to teach them budgeting or how to identify the healthy foods within a supermarket.

#### 4.3.3 Photovoice interviews (n=7)

Ten mothers who participated in the sit-down interviews were invited to PVIs, and 7 agreed to participate. For a two-week period, each participant met with the researcher and was provided with the photo guide (see Appendix G). There was an initial meeting with each participant to explain the project, review the photo guide and check for any questions of clarification. I checked in with participants (either by email or text messages) a few times over the course of the two-week picture-taking period. At the end of the two weeks, I met with each participant individually, where I downloaded the photos on to my computer and we discussed each photo one by one. Participants took anywhere from 15 to 40 pictures, with the former representing roughly one picture per question. Participants explained what each picture was about and how it related to a question in the photo guide. The photovoice interviews took place



between January to March 2013, lasted between 20 to 60 minutes, were recorded and then transcribed. The initial meeting to explain the project was not recorded.

Many of the photo-responses were similar to the sit-down interview responses. There were many photos of both Costco and Superstore that were taken in response to preferred and avoided stores, respectively. Several of the photos were of poor quality due to low camera resolution, were out of focus or taken in the dark without flash, but discussion of these photos was kept in the analysis. Five of the seven participants answered the question, *What makes it hard to eat healthy food?* with pictures of snow. See Figure 4.1.

Shopping in colder weather necessitated foodwork practices that differed from the warmer months. This was largely because of the difference in school schedules across seasons, where the foods purchased were appropriate for that time of year, such as needing more snacks to pack for children’s lunches during the school year. When the weather turned cold, many spoke of buying more food per trip to reduce the number of grocery shopping trips. “I’d rather be sitting under a blanket.” Colder weather often meant snow, and snow often entailed challenging driving and parking lot conditions. Participants factored in the weather when deciding when and where to shop, favouring stores with underground parking or well-maintained parking lots.



Figure 4.1 Snowy weather makes it hard to eat healthy.



Like the price monitoring work that sit-down interviews participants described, photovoice participants took pictures of the flyers they scanned regularly when deciding where to shop and what to buy. They described reviewing the flyers that came with newspapers but that they usually only paid attention to the flyers of their main stores. Some participants also monitored prices online, though they did not specify if they checked each store’s website or if they used an app to track prices. They used the information in the flyers, such as current or upcoming sales, to decide when to go shopping, which is evident in Figure 4.3.



Figure 4.3 Constant price monitoring is required.

Time, weather and money were reflected in the pictures as mirrors of barriers and facilitators to eating healthy. Overall, the pictures collected in the PVI interviews confirmed sit-down interview perceptions of affordability and accessibility, but further analyses did not yield new insights into retail FE perceptions.

#### 4.3.4 Go-along interviews (n=3)

Three mothers who had participated in the photovoice project and who represented high, mid and low SES neighbourhoods were invited to participate in a go-along interview. In these interviews, I accompanied participants on one of their ‘average’ grocery shopping trips to their main food store. These three participants defined average as buying one week’s worth of food. These interviews took place between December 2013 and March 2014, and I met participants either at the store or at their home, depending on what was most convenient for them.

Participants wore a microphone attached to a digital recorder that they carried in their pocket, and I used a digital recorder app on my phone as a secondary audio backup. The use of the phone was perceived as less intrusive than holding up a microphone attached to a second digital recorder, and the phone also drew less attention from other shoppers in the store. These were important considerations in maintaining as natural a shopping environment as possible.

In addition to varying in neighbourhood-level SES, each mother represented variation in foodwork practices: in their semi-structured and photovoice interviews, they each named a different main food store and differed in their descriptions of daily schedules, how they shopped for food and how they prepared meals for their family. These three mothers were selected to highlight a range of neighbourhood-level measures (SES) and household characteristics (demographics, palate preferences among family members and children’s schedules). All three participants did most of the food shopping and meal preparation for their household, and all three owned a vehicle.

Before each interview began, I asked participants the same questions:

1. Why are we going to this store, on this day and at this time?
2. What items do you plan to buy and how much money do you expect to spend?
3. Will you shop again this week? If so, when and where? What else will you buy?

Responses to the third question was often addressed in their answer to the first question. While we were shopped, I asked participants to narrate what they were buying and why, and to explain their movements throughout the store (“Give me a running monologue of what you’re doing and why”). I supplemented their guided narration with frequent questions (“Why did you avoid this aisle? What do you usually buy in that aisle?”). At the end of the trip, I asked several follow-up questions regarding what they bought and their thoughts about how much they spent. Did the items they bought and the amount that they spent match what they had anticipated? See Table 4.4 for a brief overview of participants’ shopping and cooking practices.

Table 4.4 Participants' shopping and cooking foodwork

Name	Neighbourhood SES	Her main store(s)	How frequently she shops for food	Her approach to preparing meals
Caroline	High	Safeway. She also picked up items while out doing errands.	Several times a week, almost always mid-day during the week.	Wanted to cook one meal for everyone, but often ended up preparing several different foods to please everyone.
Sarah	Mid	Superstore, with top-up trips at the Sobeys across the street from where she worked.	Usually once per week, unless she was out of a specific item or needed to walk the dog.	Wanted everyone to eat healthier food but had a hard time convincing her husband and son. She mentioned her weight several times over the course of the three interviews.
Paige	Low	Costco and Co-op.	Once per week, depending on her day off for her work cycle that week.	Spent much of her 'free' time preparing food (making large batches of sauce, slicing ham for sandwich meat, preparing and freezing burger patties).

**Caroline** was a stay-at-home mother of two children living with her husband in a high SES neighbourhood. There was a supermarket 500 m from her home, and a total of two supermarkets and one convenience store in her neighbourhood. She shopped several times a week, almost always on weekdays before the after work crowd arrived. She cooked nearly every day, describing her family as “very picky eaters.” **Sarah** and her husband were both employed full-time outside the home, had one son and lived in a mid SES neighbourhood. For part of the year, they billeted a junior league hockey player. Sarah lived in a neighbourhood with no supermarkets and two convenience stores; however, there was a supermarket 2.2 km from her home, in an adjacent neighbourhood. She did most of her grocery shopping on Saturday mornings, preferring not to shop after work. She also cooked most days of the week, striving to provide healthy food for the junior hockey player – a requirement for billeting - as well as provide palatable food that her husband and son would eat. **Paige** was a single parent of two children, and they lived in a low SES neighbourhood. At the time of the interview, there was one convenience store and no supermarkets in her neighbourhood, though there was a supermarket 2.3 km from her home in an adjacent neighbourhood. Her employment was shift-work based, which meant that her days off work changed on a weekly basis (for instance, she would have Monday off one week, then Wednesday off the next, etc.). She primarily bought whole foods and cooked from scratch. The majority of her food shopping and cooking was done on the days she was not at work.

All three participants owned a vehicle and owned their home. All three were white and, except for Paige, lived in Saskatoon their entire life. Paige moved to Saskatoon in 2006 but grew up in rural Saskatchewan.

#### 4.3.4.1 Caroline

Caroline was a married, stay-at-home mother of two adolescent children living in a high SES neighbourhood. The nearest supermarket was 500 m from her house. She grew up in Saskatoon and still shopped at the supermarket that her parents had shopped at. Her daughter was 12 and her son was 14 years old. When I first met Caroline, she had recently started shopping and cooking for her father, who had become ill. She cooked most days of the week and, in our

first interview, emphasized exhaustion from trying to please everyone's palate and preferences - her husband, her children and her father.

Making meals for my dad is very exhausting because I'm still trying to give care of my own family and I'm in Safeway and I'm trying to look and find instant meals, frozen dinners that will fit the rules of no salt, no spice, no tomato sauce, no citrus. There really is nothing and the other day and I don't have time nor do I want to but just for a fleeting moment I thought to myself, someone needs to start a business where they have individual portions for seniors frozen, ready for sale to go that are not spicy, not citrusy, not salty, because man I would load my grocery cart with that right now if I could find it because I don't have time to cook for my dad like this and I can't find the stuff anywhere.

At the time of our first interview, she was on a diet called Ideal Protein, wherein she mainly ate vegetables and protein. She mentioned being hungry all the time and putting her own food needs last because of foodwork expectations for her family.

The last couple of years I'm getting really tired and really bored of cooking because I've been trying to try different recipes and stuff and when I do that then I have to plan ahead, I have to, you know, think a day ahead for the recipe, make sure I go get those ingredients and I also need to give myself more time at supper to cook them because I find it really hard to read a recipe and cook at the same time, to try to stir and then find my spot again, stir and then okay, what number am I on?

Nevertheless, she mentioned that she enjoyed cooking and learning new recipes.

But once I've made it once then if it's a keeper it's not a big deal, so I try and do a couple of the basic meals a week and then I try to mix in some new stuff every week.

For instance, she and a few friends had gotten together to cook several big batch meals that they then divided among them to take home. She also mentioned occasionally shopping at a store that provided pre-measured ingredients for specific recipes. Acknowledging that this food store was expensive and didn't yield many portions, she liked the convenience of picking up an entire meal's worth of ingredients from one store and that this approach encouraged her to make new dishes that she might not have otherwise tried.

I don't deviate from how I, the easy stuff like that, those are no brainers because I always have meat in the freezer so if I'm in a hurry all I have to remember is in the morning to just take out a pack of beef, you know, chicken or pork, put it on the counter and I know when I get home if I



just either make a potato or a rice and a vegetable I have an instant meal, it's easy.

She didn't mention being specifically exhausted by ferrying children around, nor did she emphasize preparing quick meals before or after these activities. She was, more than anything, exhausted from trying to please competing palates in her home. She refused to cook more than one meal at dinner time, but later admitted that she sometimes did so when her children refused to eat or threatened that they would eat "one carrot for dinner instead." She was equally frustrated with herself for catering to their demands, but she also felt guilty if they went to bed hungry.

Her grocery shopping schedule was flexible and allowed her to shop mid-day during the week when the crowds were fewer. She has impromptu stops during the day to pick up groceries within her activity space. And, while she had stores that she preferred, she also adapted her shopping practices to fit around other activities.

If I happen to be out and about and I was like, 'Oh, shoot! I remembered that I needed this,' whatever was the closest if I was driving by. But I don't do that very often because I'm quite organized and I keep a list going in all the times, but there are some stores where there's certain things we like at that store and we can only get it there.

Even though she was prepared to adapt her shopping practices to fit her schedule, she also expressed her preferences for specific items from specific stores.

Like for a long time I would go, I do not like Superstore but for a long time I would go there just to get chicken breasts because I liked their chicken breasts; frozen chicken breasts. But now that we also go to Costco, it's for specific things that we can't get at Safeway, like their frozen chicken breasts. We get all our meat there actually, you know, at Costco. So there's just some specific things at Costco that we like but everything else it's Safeway.

I met Caroline at her home on a late Thursday morning in November. At that time of year, the snow had been on the ground for several weeks. We chatted for a few moments in her kitchen and I asked her to tell me a little bit about this shopping trip. How much food did she plan on buying and how much did she think she would spend? "It's probably going to end up being around \$300. Somewhere between \$200 and \$300, I would think." I then asked why she

chose that store on that day at that time. "Any time from Monday to Friday is good, but I never go shopping on the weekends. I'm at home, so I don't need to fight those crowds."

We headed off in her SUV to Safeway, a medium-sized chain supermarket. While it wasn't the supermarket closest to her house (which was 500 m away), this Safeway was 850 m from her home. Though she did most of her shopping at this Safeway each week, there were a few other stores she shopped at because of visual or memory prompts based on her schedule, as noted earlier. She had been shopping at this Safeway location for many years. She noted that this time of year she did not pick up a cart from outside, citing cold fingers and the challenges of pushing a cart through the snow. See Figure 4.4. For this reason, she also preferred shopping during times when she knew there would be fewer people in the store, which meant she could find a parking spot near the entrance of the store.



Figure 4.4 Snow makes it hard to shop for food

Once inside, the store was quiet. There were only a few other customers. Most of them were shopping alone. Music piped gently throughout the store. Caroline pulled out a shopping list, hand-written on paper. "Every store is different, so my list works best for this store (Safeway). I know it like the back of my hand. And I cross things off as I go, so I'm not second-guessing myself." We meandered through the entire produce section and chatted affably about dinner ideas and the challenges of feeding picky eaters. "When it comes to fruits and vegetables,

I don't specifically write on my list what I'm getting. I just go with what I think they're going to eat," she said as we scour the produce aisle for braces-friendly fruit options. As we made our way through each aisle, she described her daily struggles of providing food for a family of highly selective eaters.

The other day, my husband informs me that he's getting sick of eating broccoli and cauliflower. And honestly, between braces, picky kids, things that they're not allowed to take to school, I want to quit. I'm tired of this job. I can't... I'm running out of ideas trying to please too many people.

In her photovoice interview, she had taken pictures of her daughter's scowl at eating pasta for dinner, and of her son's braces. Both pictures were responses to the question *What makes it difficult to eat healthy?* and summarized her feelings of having to cater to different needs within her household. For reasons of confidentiality, only the pictures of braces have been included here. See Figure 4.5.

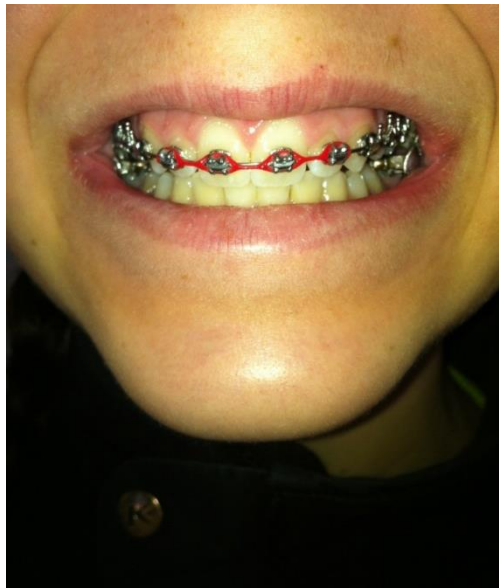


Figure 4.5: Picky eaters make it hard to eat healthy

Throughout the trip, she identified certain items she wouldn't buy at this store because she perceived those items to be cheaper elsewhere. Picking up a package of chicken, she said,

I can get that at Costco, and in a bigger pack. I just assume it's cheaper. I don't actually know that. I've never actually done the math, so it's not fair for me to say that it's cheaper. I just think it is.

Both in an earlier interview and again on this trip, she spoke about the significant financial difficulties her family experienced in the not-too-distant past. As we perused the meat section, she said that as a result of that earlier hardship she now "treats" her family to better food.

A few years ago, we were very, very broke. My husband was out of work and we were in a lot of debt and it got to the point where we were just about two days away from going to the food bank. We were in a bad, bad place and it had been months of 'How do I stretch this food so that we can eat?' It was really, really hard to figure out on very limited budget how to still eat healthy. I didn't waste anything [...]. I mean, even if it was to a point where say I had made stew one night and they still had food left over in their bowls, I would scrape that into a container to feed them the next day. We wasted nothing. And so that's part of the reason I started shopping at Superstore during that time, as much as I hated it, because I couldn't afford to shop at [her preferred supermarket] anymore. Because there is a difference, there is a big difference. I actually did a shop one time where I bought the same groceries at both places and I price checked it and it was a third more expensive to shop at Safeway than over at Superstore. So, I was very, very frugal and I was shopping there even though I hated it. So now that we can afford to eat better and I can afford to shop here, I do. But I'll never forget that.

Caroline's earlier experiences, along with another low-income participant living in a high SES neighbourhood, point to hidden poverty. The latter participant lived in a house that was in need of repair – for instance, the floor of the living room had been ripped up but not replaced, and the walls of the basement were covered in black mould. She lived in what is now a high SES neighbourhood but had purchased her home several decades ago when housing prices in the neighbourhood were significantly lower. At that time, she had several incomes in her household to rely on, but now relies on her monthly pension to support herself and her grandson (the boy's mother had left when he was young, and no other mention of her was made during the interview).

Caroline and I wound our way through nearly every aisle, which she admitted wasn't her usual style of shopping. However, it was clear that she enjoyed talking to someone about her foodwork. As we moved through the store, she picked up many items to tell me why she would or would not buy it. After 40 minutes of shopping, we joined a very short check-out line.

Caroline talked about how, on many of her shopping trips here, she lingered in the store afterward to chat with the staff. Many of the staff knew her and her mother, and now Caroline's husband and children, as well. The cashier rang through the sale and asked, "Do you need a hand with this stuff? You're okay?" Caroline declined the car service and we made our way through the snow back to her car. She was able to buy most of what was on her shopping list and would go to another grocery store later in the day, after completing several other errands. She would buy her remaining items later in the day at that store, which was in the direction of her errands. She felt that she had bought what she thought she would buy at Safeway, though the store didn't carry a few items this week that she needed. Her final bill on this trip was \$152, which was \$48 less than the low end of her estimate of between \$200 to \$300.

#### 4.3.4.2 Sarah

Sarah worked full-time at an office during the week. She, her husband and their 12-year old son lived in a mid SES neighbourhood. The nearest supermarket was 2.2 km from her house, in an adjacent neighbourhood. When I first met Sarah during our sit-down interview, her family was billeting a junior hockey player. He lived with them during the hockey season and, as part of this arrangement, Sarah was required to provide healthy meals. Given his active lifestyle, he consumed a lot of food. In her first interview, Sarah admitted that, were it not for this hockey player, her family would eat more refined white flour-based foods. "We would basically just eat pasta all the time."

Similar to Caroline, Sarah spoke of her efforts to lose weight and that this partially influenced her foodwork. She was among the few participants who mentioned walking to the grocery store nearest her home, though it wasn't her main store. In the sit-down interview, she said she went to this store only to pick up an item or two if she had to walk the dog anyway (see Figure 4.9). "Well, the fact that I'm constantly 30 pounds overweight, yeah, helps. I always think I should walk somewhere rather than drive." See Figure 4.6. Since non-service dogs are not allowed in stores, she likely did not walk to the grocery store often in the winter if it meant leaving her dog in the cold.



Figure 4.6: Sarah sometimes walks to a grocery store when walking her dog.

In our first interview, Sarah spoke extensively about the negative influence that her parents had on her family's diet, particularly on her son's diet. For example, her parents would bring potato chips and soft drinks to her home despite Sarah's protestations for them to stop. Their actions caused Sarah significant distress, as she felt her parents undermined her efforts to provide nutritious food for her family and to model healthy eating practices.

Throughout all of our interviews, she discussed looking for food that contained or excluded specific ingredients that she felt impacted health.

When my little guy was in Grade 2 or 3, they [teachers at his school] said, "Have you checked him for ADHD [Attention Deficit Hyperactivity Disorder]?" My doctor laughed, she just said, "Come back when he's in Grade 6 and still the same." So in the meantime, we tried to cut out all processed foods and additives.

Sarah tried to model healthful eating for her husband and picky son. Eating the same foods as the junior hockey player, who her son looked up to, made it easier to eat healthy. On more than one occasion, Sarah mentioned wishing that her son ate fish, which she felt was very healthy and wished that her family would be agreeable to eating it more often.

Throughout the week, Sarah sometimes picked up a few groceries ("but not toiletries") from the Sobeys supermarket across the street from her office. She did most of her grocery

shopping on Saturday morning at Superstore. She hated the Saturday morning crowds but didn't want to go Sundays because, "The shelves are bare by then." She described Safeway as a store that she would like to shop at. "I like the produce section, it's smaller than Superstore. I like the way the produce section is and the bakery right there. I like the bakery. Very friendly staff." I asked her why she doesn't shop at Safeway. "Money. It's cheaper at Superstore and I usually need a lot of stuff, so I don't like to go to Safeway." She appreciated the underground parking available at Superstore. "Stupid snow. You know, that's a big reason why I go to Superstore. Because of the underground parking." Of note, only the mid-SES neighbourhood Superstore location had underground parking.

I met Sarah at this Superstore for our go-along interview on a Saturday morning in late November.

I maybe would have done my shopping today at Costco if I had to go out there anyway, but it's kind of one of the bigger grocery shopping trips (that I do), and those two factors are huge. And I knew I could get a lot more groceries for 250 bucks (\$250) at Superstore, rather than Costco.

She had already been to the Farmers' Market that morning to buy a few items for a party that night. "I just bought jam and kettle corn, but I could have gone crazy there, though. The baking! The cheese!"

We met in the foyer of Superstore, surrounded by the din of rattling shopping carts. Holiday-themed marketing and promotions had begun. I attached the microphone to her recorder and placed the recorder in her pocket. Curious onlookers stared surreptitiously. I began with the standard opening questions. She described a seasonal deal of a free poinsettia with purchases over \$200. She cited these kinds of promotions and offers as a significant reason for shopping at this store. To qualify for the poinsettia spending requirement, she planned to complete majority of her week's purchases here, and she anticipated spending \$250. Sarah had a hand-written list of her essential items but knew it would not total more than \$200. To make up the difference, she planned to purchase a few more of her family's "usual items, like yogurt and sandwich meat."

Before pushing the shopping cart into the store, she tied her hair back and secured her handbag straps onto the handles of the cart. She told me this was an important first step to grocery shopping, to "protect my stuff." We started in the toiletries aisle at the far end of the store, then made our way through the adjacent house wares section. We continued along the back

of the store and headed towards the dairy aisle on the opposite side of the store. "I usually go on the outside first, and then weave in and out." Sarah and I had developed a rapport and we chatted amicably as we walked through aisles. However, our conversations were clipped since we spent a great deal of time zig-zagging through the aisles, sometimes backtracking to areas of the store we previously visited. This was partly because of prompts from numerous visual cues, which reminded Sarah of items she needed or gave her ideas of what foods to prepare. More than responding to these visual prompts, however, she chose routes that helped her avoid the crowds. She avoided congested aisles, which necessitated constant route recalibration. "I'm taking you on a bit of a stray. I don't know why. I don't usually come here, but you wanted to know... I usually go down there, but there's too many people here." We frequently bumped into other customers, jostled – or were jostled by - other customers as we endeavoured to make our way through the aisles. Sarah has shopped at this store for years and remarked, "You know, it used to be different. I don't know if you used to shop here, but it's different now. I think they're trying to make you go up every aisle or something. I don't know why."

As we moved through the aisles, she informed me of the nutritional value of foods that she purchased. "We usually buy Vector (a type of cereal), but it's [nutritionally] terrible, I shouldn't buy it." She inspected several brands of ham and I asked why she preferred a particular brand. "Because there are no nitrates. Because it's ham, water, sea salt, vinegar... [she scanned the ingredient list]. Yeah, gluten free, but not nitrate free? What's 'smoked'? That's probably nitrates? It doesn't say it has nitrates. Well, it makes me feel better." We briefly visited the produce aisle but, because she purchased most of her vegetables earlier in the week (during her lunch hour at the Sobeys across from her office), she didn't purchase many vegetables on this trip.

The trip was completed in 56 minutes. Her final bill was \$215, which was \$35 lower than her prediction. As we proceeded through check out, I remarked on how large the free poinsettia was. "That's why I shop here," she replied. "It's like \$25 for free!"



#### 4.3.4.3 Paige

Paige was a single mother who worked full time outside of the home, at a job where her schedule changed weekly. This changing schedule meant her day off from work varied week to week, which was the day she completed much of her foodwork. Paige, her daughter (12-years old) and son (16-years old) lived in a low SES neighbourhood. The nearest supermarket was 2.2 km from her house. Divorced for many years, her children sometimes stayed with their father in rural Saskatchewan, but they lived with Paige. She herself grew up in rural Saskatchewan and, after living in a very northern community for several years, she and her family moved to Saskatoon in 2006. Out of all three go-along interview participants, and even out of all sit-down interview participants, Paige was constantly engaged in foodwork. This foodwork, in addition to her carefully planned shopping trips, included preparing meals from scratch and making the ingredients for those meals from scratch (such as meatballs or pasta sauce). She relied on prepared foods, such as pre-made pasta sauce, as a last resort but tried to avoid them because of the high sodium content and other unhealthful ingredients. “It’s not good for you, but it’s helpful sometimes to have it around.” Paige was constantly planning, shopping, prepping, cooking, freezing and canning. She did her most of her grocery shopping and cooking for the week on her day ‘off’ from work. Her daughter played volleyball at school, but neither Paige’s daughter nor son were registered for additional programs outside of school. In our earlier interviews, Paige only slightly adjusted her foodwork in relation to her children’s after-school activities.

Paige picked me up from my apartment on a cold, slushy Monday in March, her day off that week. Her daughter was off school for the week and accompanied us on this trip. She was affable and easy going, and very excited about participating in research. Together, the three of us went to Costco, where Paige had 2nd-tier membership. This tier meant that she had access to additional sales, available via coupons specific to that tier. When we entered the store, I commented on the crowds in the store and she reminded me that many people have the day off work and are therefore likely to shop that day.

Opening with my usual questions of why this store and why this day, she replied,

I have my coupons. They have these coupons for Executive Members, \$10 off chicken breasts and stuff, so that’s why I’m coming. That’s a good deal. I always get more back than what a membership costs every year. So, it’s worth it for me.

She came to the store that morning with a booklet of Executive Member coupons and a handwritten list of six items, which together served as her shopping list. "I have a bit of a shopping list written, but it's mostly in here (points to coupon booklet)." When asked how much she planned to spend, she said \$150 at Costco, and \$25 at the Co-op we went to after.

Where she shopped each week, in addition to Costco, was based on the sales flyers and coupons that she collected. This influenced what she bought, and from where, each week. Figure 4.7 is a photo that Paige took of her receipt from a previous shopping trip to Co-op. Every item on the receipt was marked as 'advertised special,' further underscoring the fact that she constantly monitored prices in order to only buy items when they were on sale.



Figure 4.7: Paige planned her shopping around sales and special offers

As we walked through the warehouse, stopping only in the sections where her sale items were located, she told me that she recently purchased an additional refrigerator. She regularly

bought the majority of her produce at the warehouse, and I asked if she ever found the quantities too big. "Depending on how much," she replied. "Some of it's too much, the quantities are too big. But now that I've got that second fridge, I can store stuff. That's why I got it." As we continued through the aisle, she described the differences in price of her regularly purchased items. "They've got this ice cream on sale, \$3 off. So that's pretty good for \$3. And they have my detergent on sale, too. Has quinoa ever gone up in price! It used to be, like, \$12-13 for the bag here. Now it's \$20!"

Paige moved quickly through Costco, going exactly to – and only to - the items on her list. When one particular item wasn't there (the aforementioned chicken breasts), a staff member tried to assist her by looking in the back of the other freezer sections. *She explained to him* where they were always located and that, if there weren't any in that section of the freezer, then they were out of stock. Having ascertained that she couldn't get them on this trip, she scheduled her next grocery trip so that she could return to get the chicken while it was still on sale.

As mentioned earlier, Paige did most of her cooking from scratch, almost always on her days off from work.

Co-op had the whole hams on. I buy the boneless hams there and I have a meat slicer at home. So, I slice it up for cold cuts, for [my son]. It's just a lot cheaper doing it that way than buying it in a deli.

Similarly, she bought food in bulk to economize on sales, and cooked and froze large amounts of food. The acquisition of a second fridge allowed her to store more produce and, therefore, continue to benefit from Costco's economies-of-scale prices.

Her daughter was very interested in our interview process. She helped me attach the microphone to Paige and did a test recording to make sure it worked. As we moved through the aisles, Paige's daughter added her own commentary about foods she liked or disliked, as well as pointing out what her mother usually bought at this warehouse. When Paige mentioned that she would buy pre-made hamburger patties to feed the contractors coming to fix her roof next week, her daughter protested. "But I prefer your hamburgers! Please don't buy these ones!" Paige explained the convenience of pre-made burgers in this situation and promised to make her home-made burgers soon. Beyond this comment, the only other request her daughter made at Costco was for a large bag of potato chip-like snacks called Veggie Straws. When her daughter was out of earshot, Paige quietly said, "This is why I don't bring her shopping."

She mentioned in her sit-down interview that she determined affordability by how long her produce lasted. She factored this into her assessment of whether the item was expensive.

I've bought vegetables from Superstore but they don't last as long. Like Co-op, I know they have different grades. I used to go to another grocery store, too, but I usually tend to stick to [shopping at] ones that I know have vegetables that will last.

She typically bought just enough produce to last 1-2 weeks, "because I kind of go from one pay to the next." As noted earlier, her work schedule was highly variable and determined when she could find time to shop. "I try to go during the week. But, depending on what my shift is at work, that's when I shop." She indicated that seasons affected when and how often she shopped for groceries, too. "I stock up on more in the winter so I'm not running out as much."

Predicting she would spend \$150 at the warehouse, her final bill was \$154, a difference of \$4. "And I saved \$21... \$28," she said, looking at her receipt. "That's not bad." This shopping trip was completed in 25 minutes. We then headed to the Co-op nearest her home to pick up the produce items she doesn't buy from Costco. "The bananas from Costco ripen too fast. The bananas from Co-op last longer. It's not a good deal at Costco." This second supermarket trip was completed in under 15 minutes and her bill came to \$24, a difference of \$1 from her prediction. She said this was usually how much she spent at this store, indicating that she likely bought the same items on each trip to Co-op, though I didn't ask if she waited until the items were on sale. At Co-op, her daughter made a request for a cookie from the bakery, but otherwise didn't say much while in the store. Afterwards, Paige dropped me off at home and her daughter thanked me for "this fun experiment."

In each of these narratives of grocery shopping, differences and similarities emerged. Product quality and price were considerations that all three spoke of explicitly, though in slightly different ways. Caroline preferred the in-store offerings and quality of her main supermarket, Safeway, even though she acknowledged that Superstore was significantly cheaper. Sarah spoke of wanting to shop at Safeway, where she perceived the produce to be of better quality and the store atmosphere to be more inviting. However, she did not because she perceived Superstore as significantly more affordable for her. Paige relied on weekly sales to determine what she would buy that week. While shopping at Costco, her shopping list was the booklet of coupons she had

received as an Executive Member, underscoring how much of her purchasing decisions were driven by sales.

Caroline treated her family to what she perceived as better foods now that their financial circumstances had improved. But she monitored prices if she thought it was cheaper to buy larger quantities of foods that her family liked. She admitted that she didn't actually know the difference in price between Safeway and Superstore, she "assumed it was cheaper" at Superstore. This stood in stark contrast to Paige, who could describe the difference in price down to the dollar.

Where many of the sit-down interview participants described their disdain for the produce sold at Superstore, this was not mentioned by Sarah. Instead, she described how she would rather buy produce from Safeway, an implicit admission that, if she could afford it, she would not shop at Superstore. Paige was the most attuned to price and quality considerations. She overwhelmingly preferred to buy nearly everything in bulk, except for produce because it spoiled faster. Despite buying a second fridge to accommodate the size and quantity of food sold at Costco, she still bought much of her produce from Co-op. She cited the pragmatism of buying just enough produce to not waste food. Paige went from one paycheque to the next, thereby necessitating these smaller shopping trips. She had a precise decision-making process for when to buy in bulk and when to not.

A positive relationship with a store was most evident with Caroline, whose family had shopped at Safeway for two generations. She knew the staff well and often spent time in the store chatting with them. This place attachment was the reason she shopped at a supermarket slightly further from the supermarket nearest her home, and why she was willing to pay more for groceries. As Clary et al (2017) note, "Eventually, repetitive visits may foster emotional bonds with the physical site, transforming non-cognitive routines into a genuine place attachment. This in turn decreases perceived substitutability of the chosen food outlet by alternatives" (Clary, Matthews, & Kestens, 2017, p. 4).

#### 4.3.5 Personal food environments: Routines of practice

The term *routines of practice*, adapted from the work of the French sociologist Pierre Bourdieu, has been used in FE literature to represent habitual approaches to food shopping (Bourdieu, 1984; Thompson et al., 2013; Webber, Sobal, & Dollahite, 2010). Thompson et al (2013) describe routines of practice among low income shoppers, ranging from lowest to highest sense of agency: (1) chaotic and reactive, (2) working around the store, (3) item by item, and (4) restricted and budgeted. Low agency behaviours rely heavily on environmental cues within the supermarket and, conversely, high agency behaviours are highly planned, incorporate little impulse purchasing, and are often guided by economic or health-related criteria.

A routines of practice lens was applied to the go-along interview analyses, looking at participants living in neighbourhoods of varying SES, to describe shopping practices using FE research familiar concepts and categories. Sarah's shopping style fell predominantly within *chaotic and reactive*, where I observed her moving quickly around the supermarket, doubling back when something caught her attention, sometimes visiting the same aisle several times. I noted that she frequently responded to in-store cues. For instance, as we passed a stack of discounted coconut water bottles, she mentioned that she liked making smoothies with coconut water. She reasoned that the price was good and that buying several bottles would encourage her to drink smoothies more often. Her routine of practice was a well-developed response to the chaos of the store. She knew how to navigate the crowds, was accustomed to the noise and the long line-ups at the cash register, all of which resulted from extensive experience of shopping at Superstore. Sarah, even with a well-established shopping style resulting from years of experience, responded to visual cues as prompts to improve her food diet. Improving her diet meant she tried to align her purchases with how she and her family could eat more healthful foods. With a picky child at home, Sarah knew that there were limits to how much healthy food would actually be eaten at home. Earlier, Sarah had used the example of fish, which she felt to be very healthy but knew that her son wouldn't eat it.

Paige's routine of practice fell into *restricted and budgeted*. She made only planned purchases of items that she had a coupon for, or items that were on her roster of regular purchases. She navigated both a large warehouse and a mid-sized supermarket with calculated precision. She went only to the aisles where she knew she needed a specific item. Of all three

participants, she was the most accurate in her grocery bill estimate: she was \$4 over at Costco and \$1 under at Co-op. Both Sarah and Caroline were under their estimates, \$35 and \$48, respectively. Paige's restricted and budgeted routine of practice was the result of a very tight budget but was also due to her ongoing foodwork. Though she didn't explicitly discuss meal planning, but she knew exactly what she needed for the week, indicating an implicit planning system that she had honed over the years. With the additional space she had acquired because of the second fridge, she could purchase larger quantities of ingredients and batch cook meals from scratch. Specifically, she could buy more fresh fruits and vegetables, which would now last longer because of temperature-controlled storage. In this way, she was able to take greater advantage of bulk-purchase sales than most low income families who didn't not own their home or who lacked sufficient storage space (Kirkpatrick & Tarasuk, 2011; Travers, 1996).

Caroline's routine of practice fell somewhere between *item by item* and *working around the store*. She maintained a purposeful trajectory throughout the store (she wrote items on her shopping list in the order that they were located in Safeway). Like Sarah, she was prompted by in-store cues (such as stopping to peruse an aisle of herbal teas and saying that she should drink non-caffeinated tea more often). Of all three go-along interviews, this trip felt the most relaxed. There was a tranquility to the in-store environment, where the lights were softer than Superstore and slow-rhythmed music piped gently through the store. We were two of only a handful of other shoppers, all of whom were shopping alone. In contrast to the crowds at Superstore, the store felt practically empty. Caroline and I had leisurely chatted while she shopped. She mentioned in earlier interviews that she didn't usually go through every aisle, yet that was what we did on this trip. Had I not been present, her shopping style would have been much faster and more focused; certainly, her sit-down interview responses suggested this. However, she mentioned that she sometimes visited with the supermarket staff. Therefore, while her actual shopping may be fast, the total time spent at the store is likely longer. Her routine of practice at this store was different from other stores because of her attachment to that specific location of Safeway. Caroline also spoke of prior experiences with poverty, and the struggle to provide her family with palatable food at the time. With her family's financial circumstances now improved, she spoke of treating her family to better food. She still compared prices across different stores, but this was a less precise practice now that her family no longer struggled financially. Her food shopping practices were directly proportional to changes in income. Caroline's earlier experiences, along with

another low-income participant living in a high SES neighbourhood pointed to hidden experiences of poverty. The latter participant – who had declined to participate in a photovoice interview - was supporting herself and her adolescent grandson with her limited pension. Though they lived in an affluent neighbourhood, the interior of their house was badly in need of repair. The living room floor was ripped up and the basement was covered in black mould. She had purchased her home several decades ago, when housing prices in the neighbourhood were significantly lower and her household had several incomes to rely on. Her and Caroline’s stories highlighted the importance of parsing out individual circumstances among neighbourhoods and examining intra-neighbourhood differences.

#### 4.4 Quantitative and qualitative findings: Answering the research questions

This study sought to answer two broad questions: (1) What is the relationship between in-store and between-store measures, and neighbourhood-level SES? and (2) What perceptions of price and availability of fruits and vegetables do mothers have within their personal FE? Each of these questions were further divided into sub-questions, which have been addressed in this study through a mix of data collection tools and analytic approaches. Below are the key findings of this study, in response to these questions about Saskatoon’s Consumer and Community FEs.

##### 4.4.1 What is the relationship between in-store measures of price and availability of fruits and vegetables, and select socioeconomic status (SES) at the neighbourhood-level?

In this study, measures of fruit and vegetable affordability and accessibility were collected through the Nutrition Environment Measurement Survey for Stores (NEMS-S). This survey was administered in 24 supermarkets and 92 convenience stores (n=116 stores) in 60 residential neighbourhoods in Saskatoon. The overall results of this survey revealed no difference in the affordability or accessibility of healthful foods. However, when these results were further parsed out for fruits and vegetables, there were slightly higher prices of fruits and vegetables in low SES neighbourhoods than higher SES neighbourhoods. As noted throughout this thesis, though, this finding must be interpreted cautiously given the small sample size. However, since the



supermarkets measured were all chain stores, the discrepancy in price between stores is surprising.

High SES neighbourhoods had a higher proportion of supermarkets out of all store types located in those neighbourhoods (which included convenience and specialty stores), compared to mid and low SES neighbourhoods (28.6%, 12.19% and 16.4%, respectively). In low SES neighbourhoods, there were significantly more convenience stores than in mid or high SES neighbourhoods (40, 31 and 21 stores, respectively). Given this imbalance, many low SES neighbourhoods can be characterized as food swamps. Combined with earlier food store access research in Saskatoon (Kershaw et al., 2010) several neighbourhoods can be classified as both food swamps and food deserts. Many high and mid SES neighbourhoods located in the periphery of the city could also be termed food deserts, but residents are likely less affected by financial and transportation constraints.

#### 4.4.2 Among mothers in Saskatoon, what are their perceptions of price and availability of fruits and vegetables within their personal FE?

Despite no measured difference of affordability in the first phase of the study, interview participants described significant variation in their perceptions of price among different supermarkets. Participants' perspectives of their Consumer FE were not consistent with NEMS-S scores. Further, perceptions varied widely between participants. In several instances, when describing the same store, some participants felt that the store was expensive while others felt that the same store had reasonable prices. A particularly polarizing store was Superstore, where many participants noted that the prices were lower but still avoided the store because they disliked the experience of shopping there. Perceptions of affordability, in addition to absolute price, were also evaluated by participants in relation to their schedule (the cost of time) and the convenience shopping and cooking that the store offered (convenience as comfort).

The mothers of this study were a highly mobile sample – 96% of participants owned a vehicle. Participants travelled an average of 2.4 km further than the supermarket closest to their home to shop for food, with only a few participants shopping in their neighbourhood of residence. The shortest distance traveled was 850 m to shop occasionally at the now-closed Good Food Junction, and the furthest was 11 km to shop weekly at Costco. For all participants,

accessibility was less about absolute distance and more about drivability within their activity space. Supermarket locations were nodes within participants' networks, where places were perceived as near or far in relation to their spaces of prescription, such as their home, school and work. Food stores were spaces of negotiation, where participants could adjust their shopping in relation to wherever else they had to be that day. However, the flexibility to do so was proportional to a participant's financial resources, meaning that these spaces of negotiation were experienced differently by household-level SES. The participant who did not own a vehicle and lived in a low SES neighbourhood was doubly constrained in her spaces of negotiation but had developed strategies like scheduling her large monthly shopping trip when she could go with someone who owned a vehicle.

With the exception of this same participant and a few others, none of the participants indicated that they walked or biked to the grocery store, nor did they indicate that they would like to. Active transport limited how much could be carried home per shopping trip, and this was further limited by weather. Among those participants who did walk to a store, it was either to pick up one or two items that were needed that day (and didn't necessitate its own shopping trip to a main or preferred store), or to get exercise. Very rarely did anyone walk or bike to the store to complete an average shopping trip.

Positive store attributes were lower prices or better value for regularly purchased items (such as offers of coupons and in-store promotions), consistent availability of regularly purchased items, locations that were en route to other destinations of interest, familiarity with the layout of the store, and friendliness of the staff. The last two were particularly associated with place attachment, where participants favoured stores for reasons beyond lower prices and convenience. Place attachment was particularly evident among participants who favoured Co-op, because the principles of a community cooperative aligned with participants' personal values as shoppers. For others, they preferred stores like Safeway, which they noted had higher prices but offered a pleasant shopping experience. For two participants, their families had been shopping at Safeway for a long time (for generations, in Caroline's case). One participant started shopping at Superstore when her financial circumstances changed, and she indicated that she would still shop at Safeway if she could afford it. Caroline had stopped shopping there when her family went through a period of financial hardship but started shopping at Safeway again once this hardship had passed.

Negative store attributes then, unsurprisingly, were often the inverse of positive attributes. Participants cited higher prices for regularly purchased items and higher prices, overall, within such stores, as well as poor selection of regularly purchased items. In-store atmospheres were also described: unfamiliar or constantly changing store layouts, dirty aisles, unpleasant smells, noisy crowds and unhelpful staff.

Overall, neighbourhood-level SES was not a notable influence of built FE perceptions. As mentioned earlier, there were intra-neighbourhood variations in SES, with some participants experiencing hidden poverty, that is, they lived in mid and high SES neighbourhoods but faced struggles with food insecurity. Further, participants in this study were a highly mobile sample of shoppers who were not limited to shopping in their neighbourhood of residence. Instead, perceptions were a function of activity space influences: drivability, place attachment, comfort, convenience, as well as perceptions of price, which were relative to household budgets.

The next chapter, (Chapter Five: Discussion and Conclusion), examines these survey and interview findings further to elucidate themes within constructs of affordability and accessibility, using these to characterize personal FEs among mothers of adolescent children in Saskatoon.

## Chapter 5: Discussion and Conclusion

*Meanings or values ascribed to space originate from the experiences, feelings, knowledge, perceptions and social interactions that people gain from interacting with their environments (Desjardins, 2010, p. 19).*

In this chapter, the discussion of single and blended analyses is organized into several sections. Like the previous chapter, quantitative and qualitative strands are discussed here in the order that they were analyzed, and then blended to describe the personal FE of participants in this study. To begin, quantitative analyses of affordability and accessibility were interpreted in the context of common FE land metaphors and upstream approaches to urban planning. Themes of convenience and comfort characterized sit-down interviews. These themes were carried through to in-situ observations of foodwork, described as routines of practice unique to each go-along interview participant. Interpretations of survey and census findings were integrated with interview themes to present personal FE narratives.

Across this chapter, in-store measures of price were embedded within broader qualitative analyses of affordability, and in-store measures of availability were embedded within broader qualitative analyses of accessibility. In this way, fixed measures of price and availability, as well as relative measures of food store distribution, were contextualized within assessments of affordability and accessibility. Using this approach facilitated analyzing and presenting the large amount of data within this study.

The latter portion of this chapter includes reflections on the strengths and limitations of this study, including changes to the field of FE since beginning this research. This is important because approaches to measuring FEs have changed over time and it is helpful to review these changes in the context of this present study.

### 5.1 Assessments of availability

With the finding that low SES neighbourhoods had significantly more convenience stores than high and mid SES neighbourhoods, low SES neighbourhoods met the definition of food swamps. And while none of the three neighbourhood types had many supermarkets, high SES

neighbourhoods had a higher proportion of supermarkets when compared with all store types in the neighbourhood. This combination of absolute (count) and relative (proportion) measures paints an overall picture of an unfavourable Community FE in low SES neighbourhoods – there are many stores, but relatively (and theoretically) fewer healthy options in these stores. Distance, however, wasn't identified by participants – of any neighbourhood type – as a significant barrier to accessing a grocery store. The participant without a vehicle had developed strategies to access stores (get a ride with her parents to Superstore once a month) and to carry items home (bring her children with her or take a taxi), though taking a taxi was not financially favourable. Overall, this participant was more constrained by affordability than by accessibility, since she had a hypermarket-type store (Giant Tiger) within walking distance.

For many participants, the feelings about the absence or presence of a local grocery store were more ideologic than practical. The presence of grocery stores created positive neighbourhood perceptions but did not seem to affect how participants shopped for most of their food. Shopping at local stores was often attached to other activities, such as walking the dog or getting some exercise. Only a few items were purchased during these local trips, and only items that were in immediate need. The participant without a vehicle often had her children, ages 7, 11 and 8 months, and sometimes her 17-year old son, accompany her on these trips. Everyone but the baby carried at least one bag of groceries home.

The descriptor of a swamp connotes an undesirable space (Elton, 2019), one filled with an abundance of unhealthy food options such as convenience stores or fast food outlets (Public Health Agency of Canada, 2011), but offering little in the way of healthy food access. Previous research in Saskatoon (Cushon et al., 2013; Kershaw et al., 2010) characterized several low-income neighbourhoods in Saskatoon as food deserts, and found that most residents in Saskatoon did not have a grocery store within walking distance (1 km or less). It is a fallacy that food deserts *cause* unhealthy eating (Allcott et al., 2018), but the evidence of adverse health outcomes from nutrition-related conditions indicate that many people are not eating well. However, this has less to do with making poor individual food choices and has more to do with SES conditions that confer hardship on communities such as poverty, perceptions of safety, and inadequate housing (Kirkpatrick & Tarasuk, 2011).

Quantitative assessments of the retail FE in this study found co-occurrences of food deserts *and* food swamps in these very same low-income neighbourhoods. Concentrated within

the centre of the city, these older neighbourhoods were unlikely to see investment from medium or large chain grocery stores. Possible reasons for this are twofold. First, retailers prefer larger (and cheaper) tracts of land to accommodate larger store formats which, regardless of SES, disadvantages central or traditionally urban neighbourhoods (Pothukuchi, 2005). Second, sites of former grocery stores in low SES neighbourhoods may not see future development due to the ubiquity of restrictive covenants. Also known as land sale restrictions or anti-competition clauses, restrictive covenants are a real estate practice that prohibit future grocery stores from developing where previous ones existed (del Canto & Engler-Stringer, 2018). These real estate loopholes exacerbate the food desert-like impacts of how people can, or cannot, access healthy food (Ziff, 2016). Marginalized neighbourhoods – where incomes are low, unemployment is high, healthy food stores are scant and, more often than not, where racialized communities experience systemic injustice (Franco, Diez Roux, Glass, Caballero, & Brancati, 2008; Inglis et al., 2009; Morland, Wing, Roux, & Poole, 2002; Raine, 2005; Thornton et al., 2012; Zenk et al., 2005) - bear the biggest burden of these awful but lawful corporate practices (del Canto & Engler-Stringer, 2018). These practices discourage future grocery stores by limiting the land available for new investments and, when combined with areas of lower SES, such practices render these areas as less appealing to corporations, who seek an ‘ideal’ customer base for increasing profit margins. This is possibly the case in lower income areas in Saskatoon, particularly in the cluster of food insecure neighbourhoods in central, older neighbourhoods.

While the quantitative findings also uncovered food deserts in neighbourhoods around the periphery of Saskatoon, these were mid and high SES neighbourhoods. This was to be expected in these types of neighbourhoods, which can be characterized as suburban developments where curvilinear road networks make vehicle ownership essential (Le & Muhajarine, 2013). This style of residential design demands vehicle use and favours sprawl, thus encouraging land development that pushes further and further away from the city centre. However, as these neighbourhoods have been built along the periphery of the city, where access to inter-municipal and inter-provincial road networks is likely to be greater, they are attractive to supermarkets and hypermarkets. Future investment from food stores seeking larger (and cheaper) tracts of land, seems likely. In fact, periphery neighbourhoods that currently meet the definition of food desert may have very different food realities within the space of a few years. These neighbourhoods may eventually cease to be food deserts in the sense of lacking a supermarket,

while inner city, low SES neighbourhoods with higher population density (Lallukka, Laaksonen, Rahkonen, Roos, & Lahelma, 2007; Williams et al., 2012) will continue to struggle within this reality.

When convenience stores outnumber supermarkets in a neighbourhood, this distribution pattern is not detrimental in and of itself. As was noted even within this study, there were variations in what was considered a convenience store, as well as variations in the amount and proportions of healthy foods available. A convenience store attached to a gas station unlikely to carry the same array of fresh fruits and vegetables than a big box convenience store such as Giant Tiger, which verged on the definition of a hypermarket. However, overall, it can be deleterious when convenience stores represent the *only* option available, especially the types of convenience stores that are bereft of healthy food options. In such neighbourhoods, residents face the paradox of less choice amidst more stores. The number of food stores in a given area likely has less influence than the types of foods offered in these stores.

In big box convenience stores such as Giant Tiger, the quantity and variety of food items were comparable to a small-sized supermarket. In the absence of traditional grocery stores, or in the absence of affordable food stores, big box convenience stores like Giant Tiger filled a market void. An added appeal was the hypermarket-like design of Giant Tiger. In addition to food, shoppers could find clothing, housewares and car accessories, making it that much more appealing to shop at Giant Tiger. When residents lack vehicle access, they are more affected by their neighbourhood built environment because they are likely to be more constrained by transportation costs and opportunities for mobility (Handy & Clifton, 2001; Larsen & Gilliland, 2008; Sadler et al., 2015). The cost of food increases when transportation costs are factored into travelling to and from grocery stores, such as fuel for a vehicle or money for public transit fares. As supermarkets move further away from city centres and towards the outskirts, urban dwellers must also consider the difference in time between travelling by personal vehicle versus other methods of transportation. Public transit can take significantly, longer depending on distance, time of day, and transit schedules (Larsen and Gilliland, 2008).

When neighbourhoods are termed food swamps, it is critical to assess what is offered within those existing stores. As this study has shown, convenience stores are heterogenous and can sometimes offer food that matches what is available in some grocery stores. The participant without a vehicle was willing to walk further than her local grocery store to shop at the cheaper

store in her neighbourhood, Giant Tiger. Again, a local food store doesn't necessarily translate into a financially affordable store, even if travel time is reduced.

Although healthy food insecurity is a worrying reality that needs urgent action, many people are likely to find themselves in a position of choice among a range of food outlets from healthy to unhealthy. Yet, current conceptual proposals lack insights on how the foodscape shapes the healthy or unhealthy choice people make when both options are accessible to them (C. Clary, Augustus Matthews, & Kestens, 2017, p. 2).

Landscape metaphors that have been used to characterize FEs, such as the food deserts and food swamps, once offered utility in presenting area-level food access categorization to lay audiences. In so doing, however, these metaphors ultimately obfuscated the underlying systemic issues by overestimating the influence of spatial assessments (Bernard et al., 2007; Elton, 2019; Kane & Pamphilon, 2015; Widener, 2018). An over-reliance on fixed geographic principles – that things closer together are more related than things further apart – has led to spatial autocorrelation fallacies, such as the pervasive belief that proximity to healthy food stores result in improved diets (Widener, 2018).

In addition to the pejorative nature of associating neighbourhoods with undesirable land features, these metaphors compound several fallacies. An ecological fallacy is the assumption that people are limited to shopping within their immediate surrounding area. Such a narrow spatial view rarely accounts for nearby supermarkets that fall outside of neighbourhood boundaries but are still relatively close by (LeDoux & Vojnovic, 2013). The metaphors also dichotomize neighbourhoods as 'good' or 'bad,' without looking at the stores that do exist and without considering what is offered within these stores. As noted earlier, a simplification or conflation of disparate store types into one category, such as convenience stores, misses the differences of what is actually available within these stores.

Marginalized neighbourhoods and communities already bear the burden of inequitable food access. Using metaphors that reduce communities to undesirable land features stigmatizes these communities further. This stigma, a reflection of a deficits-based approach to characterizing neighbourhoods, results in lower investments of new grocery stores, judgement of residents' diets (Elliott & Bowen, 2018), and an overall increase in marginalization of these neighbourhoods. Individuals aren't randomly assigned to neighbourhoods – rather, they locate in



neighbourhoods based on their incomes, lifestyles, preferences, proximity to work, and a host of other factors (Gustafson et al., 2012; McKinnon, Reedy, Morrissette, Lytle, & Yaroch, 2009). This type of self-selection bias influences the overall SES of a neighbourhood. Research has shown that people with lower incomes, for instance, have fewer choices of neighbourhoods to live in based on what they can afford, and the neighbourhoods that they can afford are likely to be termed food deserts or food swamps (Giskes, van Lenthe, Avendano-Pabon, & Brug, 2011; Leone et al., 2011; Springer, Hankivsky, & Bates, 2012). This recursive loop of low incomes and low access to healthy food stores make it challenging for residents to be, and stay, healthy.

## 5.2 Assessments of affordability

There was no difference found in measures of price or availability among supermarkets, regardless of neighbourhood-level SES, which is likely the result of most supermarkets belonging to one of a handful of chains. It is expected that prices would be the same across all locations of the same chain. While this was true for prices overall, there were slightly significant differences in the price of fruits and vegetables between low and high SES neighbourhoods, with the former paying slightly more. Though these results are inconclusive, it could suggest evidence of chain stores setting different prices depending on the neighbourhood. As noted in Chapter 3 (Methodology), a third dimension of NEMS-S – quality - was dropped from quantitative analysis because of its subjective nature. However, assessments of food quality appear in interview participants' descriptions of positive and negative store attributes. Overall, NEMS-S scores of supermarkets in Saskatoon's residential neighbourhoods must be interpreted cautiously due to the extremely small sample size (n=24 supermarkets in n=17 neighbourhoods), even though this represented a full census of supermarkets at the time of data collection. The finding of slightly higher prices of fresh fruits and vegetables in low SES neighbourhoods was troubling and suggested that healthy food access was that much further out of reach for residents of marginalized communities. Further, the findings aligned with evidence of adverse health outcomes experienced by neighbourhood residents, as reported in both the Saskatoon Health Region's Health Disparities Report (Lemstra, Neudorf, & Beaudin, 2007) and Health Canada's *Measuring the Food Environment in Canada* (Health Canada, 2013). As noted in the Literature

Review, a diet low in fruits and vegetables and high in processed foods has significant health impacts, including chronic conditions such as diabetes and cardiovascular disease (Public Health Agency of Canada, 2011).

Findings from this study provide further evidence of neighbourhood-level inequities, specifically in residents' ability to access healthful foods. These same neighbourhoods also had some of the highest proportions of children under the age of 16 (City of Saskatoon, 2015), meaning that the harmful effects of food insecurity are inter-generational and will be experienced across the life-course (Martin & Lippert, 2012; Travers, 1996; Williams, Thornton, Ball, & Crawford, 2011).

### 5.3 Interview themes: Convenience and Comfort

Individual meanings of place change over time, as aspects of the built environment change and as people change in their social circumstances, mobility, knowledge and awareness. The interviews made it clear that this meaning came from a variety of judgments, interactions and connections, all of which demonstrated the continual evolution of personal FEs. Places were perceived as near or far in relation to other nodes along routes within the activity space, perceptions of the ease or difficulty of traversing the route to the store and how much time the journey added to their schedule (Belon et al., 2016; Clary, Ramos, Shareck, & Kestens, 2015; Jilcott, Laraia, Evenson, & Ammerman, 2009). Understanding perceptions was more meaningful when locations were viewed as a series of nodes in networks rather than discrete and autonomous spatial units (Desjardins, 2010).

*Activity space* represented the sum total of spaces that participants visit within a particular period of time (Masuda et al., 2012). Participants described their food shopping decisions as a function of their daily activities and regular routines. Participants favoured stores within the vicinity of work, their children's school or extra-curricular activities, and other fixed nodes that made up their activity space. Put another way, participants favoured stores in relation to mandatory locations. The stores that participants shopped at frequently were described as being along the way to other routinely visited locations, "since I was in the area anyway." Carpiano (2009) makes a distinction between spaces of prescription and spaces of negotiation.

Spaces of prescription describe mandatory spaces in terms of formalized and standardized control, including how access to resources is organized. Spaces of negotiation are more flexible in how activities and resources are organized but can still exhibit rigidity. Home and work are spaces of prescription, for example, but some spaces of negotiation are more fixed than others (Carpiano, 2009). A clear example was participants' limited ability to change the location of their children's activities, affecting perceptions of what constituted a conveniently located food store.

*Foodwork* has been used in this study as a term to capture the spectrum of labour involved in food provisioning. In describing where they did or did not shop, participants implicitly described the foodwork that informed these decisions. Some aspects of foodwork were more obvious than others, but all participants described highly idiosyncratic approaches to their foodwork. Many participants spoke explicitly of watching flyers or waiting for sales, which were active forms of price monitoring that influenced when and where they shopped.

Comparing prices across stores, and making food shopping decisions that factored in household members' schedules, was so habitual to participants that it was virtually invisible to most. Many participants mentioned they didn't think that much about grocery shopping – they said it was something that needed to be done and so they did it. Some participants enjoyed it; a few outright hated it. Participants who expressed interest in cooking or interest in broader food issues were more explicit about their foodwork, and the way in which they articulated their food shopping practices reflected this.

In examining how participants described and assigned meaning to their personal FE - through perceptions of positive and negative store attributes, and descriptions of foodwork - themes of convenience and comfort were identified. **Convenience** described some of the decisions that participants made about how their time was spent, as well as the travel decisions they made based on their perceptions of distance. **Comfort** was identified in how participants adapted and adjusted their foodwork to reduce the familial and social pressures put upon them. This meant accommodating picky eaters so that their children weren't hungry and managing broader societal expectations of performing good motherhood.

In the neoliberal era of intensive mothering, there is an increasing moral burden on individual mothers to cultivate and bear personal responsibility for their children's health and well-being. One consequence is a great deal

of scrutiny of individual mothers' practices (Elliott & Bowen, 2018, p. 515).

### 5.3.1 Perceptions of convenience

In Wright et al's (2015) study of how working-class and middle-class mothers engaged with - and were impacted by - knowledge about motherhood, children and health, researchers used the term *time poverty* to describe the limits of participants' time. Building on this concept, I looked at how participants ascribed meaning and value to the time they spent grocery shopping. Notions of convenience came up often in their responses, where anything that made grocery shopping faster was ultimately a positive attribute. Though participants named different supermarkets that they shopped at frequently, nearly all mentioned Superstore or Costco at some point in their interview. These stores elicited a range of perceptions of positive and negative store attributes. Hypermarkets like Superstore and Costco appealed to participants by offering a one-stop-shop, creating a retail FE characterized by a wide range of products, from food to clothing to furniture and electronics. In this context, I describe activity space as the distance between regularly purchased items within a store. Hypermarkets, despite their large surface area, offer a conceptually smaller activity space by reducing the overall time spent food shopping, since the need to travel to multiple stores was reduced. Superstore was a polarizing hypermarket among participants, but those who shopped there described cheaper prices and the convenience of picking up non-food items during grocery shopping trips. Conversely, those who avoided Superstore spoke of an unpleasant in-store environment, a perception that will be discussed in greater detail shortly. With some exception, most participants spoke of Costco as a hypermarket that offered a wide array of commonly used items, but none of the participants commented on Costco's in-store environment. Among those who favoured Costco, some foods were perceived to be of better quality (many participants mentioned that they preferred to buy meat at Costco), and the larger portions sizes were cost-effective and reduced how often some participants needed to shop. For instance, one participant with six children - all under the age of 18 - emphasized that Costco was the most cost-effective option of all the stores in the city. This was noted even among families with fewer children.

Participants assessed distance by drivability, which was the ease or difficulty with which they could drive to a food store. A highly mobile population of vehicle owners meant that nearly all participants were able to access a wide array of stores across the city. This degree of access was most clear when participants spoke of shopping regularly at Costco which, at the time this study was carried out, was not accessible by public transit. It is located far from residential neighbourhoods and not easily accessible on foot or by bike because of traffic-heavy road networks (researcher observation). Costco sells large format items, making it unlikely that a person could carry much home without a vehicle, even if they could reach it by foot or bicycle. As such, access to a vehicle was mandatory for shopping at Costco if consumers were to benefit from the economies-of-scale that confer cost-effectiveness.

Walkability as a perception of distance was completely outweighed by drivability among this sample. A food retail location that was within their activity space was preferred, but the drivability of a location could expand their activity space boundaries because participants preferred those stores enough to drive further for them.

Multi-tasking enabled consumers to maximize the logistics of time and space by shopping at a grocery store on the way to another destination, one-stop shopping at a supercenter or strip mall, or shopping in an urban neighborhood with many stores. While convenience may occasionally have cost more in dollars, some shoppers reported it led to less stress (Webber et al., 2010, p. 210)

Only a few participants walked to a local food store, and infrequently at that, either out of necessity or for exercise. But for most participants, the local stores were rarely their main stores. Local stores were perceived instead as stores of convenience and were usually only considered when travel to a main or preferred store was not possible. Despite making infrequent trips to local stores, many participants spoke of the importance of having a grocery store nearby. When describing neighbourhood features that appealed to them, they idealized pedestrian-friendly neighbourhoods with at least one grocery store nearby, even if it was unlikely that participants would shop at these local food stores. However, if no one shopped at these local stores, such food outlets would have insufficient revenue to stay open. Wanting grocery stores nearby, but not shopping there, creates a market paradox.

### 5.3.2 Perceptions of Comfort

Comfort was identified as a theme when unpacking the statement “I’d rather be sitting under a blanket,” which had been repeated by several interview participants word for word. All participants described their highly personal and often complex strategies for managing foodwork and, while they sometimes had help from other family members, many participants were still responsible for the majority of foodwork, especially grocery shopping. In the case of the four participants who were single parents, they were responsible for 100% of the grocery shopping.

There were several ways that participants sought comfort in their foodwork. For some, it meant shopping at stores with positive attributes, even if participants thought the prices were higher. These were stores where participants were familiar with the layout, satisfied with cleanliness, appreciated helpful staff and enjoyed the visual appeal of how food was arranged. These kinds of stores offered pleasant atmospheres and a slight reprieve from the other, non-negotiable aspects of foodwork, such as providing food for their children every day.

For others, comfort meant feeling like they were providing their family with the ‘right’ foods, that their children were eating enough and were eating well. Participants conveyed conflicting emotions about buying pre-made sandwiches, not having time to cook meals and, for many, arguing with picky eaters in the household. Participants struggled with feeling like they were not providing their children with healthy food when they caved to the demands of a picky eater, though it did momentarily assuage the concern that their children weren’t eating enough. Participants who were single mothers living in low SES neighbourhoods were the most likely to buy food that they knew their children would eat, even if participants considered it unhealthy. “For low-SES parents, food serves as a symbolic antidote to a context of deprivation” (Fielding-Singh, 2017a). These participants were also less likely to purchase healthy food if they knew their children would not eat it, as they couldn’t afford for food to go to waste. As SES increased, participants were able to insist that their children try foods several times before deciding that they didn’t like it. These households could afford to waste some food (and lose money) if it meant that their child developed healthy eating practices. Ability to engage in this kind of nutrition education also conferred a feeling of comfort that their children were learning how to eat well.

Regardless of SES, all parents wanted to feed their children healthy foods (according to their understanding of healthy) and wanted to be seen performing responsible motherhood (Fielding-Singh, 2017a). The notion of comfort as a form of care was drawn from the work of Meah and Jackson (2017), who used the phrase ‘convenience as care’ to demonstrate how convenience foods could be used as an expression of care.

Convenience foods and home-made foods should not be viewed as mutually exclusive, with the latter perceived as inherently more indicative of care than the former, but should instead be understood in terms of the values which they are subjectively intended to achieve (Meah & Jackson, 2017, p. 2078).

Though they did not focus specifically on mothers, Meah and Jackson found that many of their participants prioritized spending more time with their family over cooking, using the foods they prepared as a way to show love (Meah and Jackson 2017). Elliot and Bowen (2018) coined the term *defensive mothering* to capture the intersectional challenges that mothers faced when trying to meet societal expectations of their children’s nutrition and their health, “the racialized and classed regulatory surveillance they experienced, and the agentic ways mothers navigated this context and sought to present themselves as good feeders and mothers” (Elliott & Bowen, 2018, p.499).

Parsons (2016) used the term *foodways* to describe the production, preparation, serving and eating of food, positing foodways as an intersection between gender and class. Foodways reflect an ecological construction of foodwork, in that it makes more explicit other important FE actors, such as governments and corporations. Parsons argued that meeting the expectations of motherhood’s foodways are a form of cultural capital, a way of “performing a particular middle-class habitus” (Parsons, 2016, p.382).

#### 5.4 Narratives of personal food environments

In considering the perceptions and routines of practice of Paige, Sarah and Caroline, the three mothers who participated in go-along interviews, there were two important considerations: Each mother owned a vehicle, and each owned their home. Having a vehicle meant that Paige, Caroline and Sarah could access a wider geographic swath of stores, could carry more groceries home per trip and that, overall, their travel time was significantly lower than people who relied

on public transit or active transport. All three mothers had a fridge and freezer appliance in their kitchen, as well as an additional deep freezer located elsewhere in the house. Costco uses an economies-of-scale model to offer discounts, where the cost-per-unit of an item is lower because they are sold in larger portions. But to pay less per unit means that the customer must buy many units at once, and they must have somewhere to safely store these units before they spoil. People living in smaller spaces or in shared housing are not likely to benefit from this model, thereby paying more for food in the long run, both in terms of money (paying more per unit) and time (shopping more often to purchase the equivalent quantity of food). In that way, Paige had considerable advantage over many lower income families in terms of having both storage space and vehicle access.

These three descriptions of grocery shopping from the go-along interviews demonstrate how variable that individual experiences of the built FE could be. Through the examination of three food shopping practices, this study adds support to the benefit of incorporating qualitative data in characterizations of the built FE, not simply to triangulate quantitative assessments of psychometric properties, but also to better understand what pushes or pulls people towards specific stores. This push-pull effect is highly subjective and qualitative research provides the most appropriate approach to understand these influences within broader retail FEs.

Paige completed much of her foodwork on the days she wasn't at work, reducing time the time she had available for other activities on those days. Her weekly schedule varied because of shift work, but her foodwork routines were consistent, such as doing the majority of her food prep on that day off. The stores that Paige shopped at was the result of weekly sales (affordability) rather than any perceptions of distance (accessibility). Sarah shopped every Saturday morning at Superstore, which she perceived as the most affordable supermarket, both in terms of regular prices and in-store promotions, such as a 'free' poinsettia. For Caroline, Safeway was her main store, shopping there weekly and often when she knew the store wasn't crowded. Like Paige and Sarah, her store choices were guided by affordability but, unlike Paige and Sarah, Caroline had the financial flexibility to favour stores that she felt offered pleasant experiences, thereby increasing her comfort. Unlike Paige, Caroline also had the flexibility in her schedule to pick up items as she remembered them while out running errands. This also indicated the financial flexibility of not needing to compare prices before purchasing items.



All three participants discussed price when talking about where they shopped and what they bought. Paige took a long-term view in her assessments of affordability. She usually purchased whole foods in bulk and prepared large quantities of meals at one time. This saved her money in the long run, though it required a significant investment of time and money up front. Paige planned the furthest ahead – though she shopped weekly, her foodwork fulfilled her family’s needs for that week, and for several weeks to come. Spending more money to save more time was not an option for Paige and, overall, is a practice that can be out of reach for many low-income households. More commonly, low income households invest more time in order to spend less money. For Sarah, when all other perceptions of price and distance seemed similar, she chose the store with a promotional offer. Overall, she described her store preferences as a balance between completing all of her food shopping in one trip (to avoid additional trips during the week) and buying affordable foods that were nutritious, the latter of which was sometimes in response to visual prompts and not necessarily advanced planning. For Caroline, who had a household of picky eaters to contend with, cost effective shopping for nutritious foods meant buying foods that would get eaten and not go to waste. Alongside this, she strove to reduce her purchases of less healthful foods, which she knew her children would “devour” if given the chance.

## 5.5 Changes to the field of FE research

My perspectives and approach to FE research has evolved as the literature grew. My perspective changed with my own publications– an article and a book chapter (co-written with Dr. Rachel Engler-Stringer). In an article about fruit and vegetable access in Saskatoon (del Canto, Engler-Stringer, & Muhajarine, 2015), I relied heavily on metaphors of food deserts and food swamps to describe Saskatoon’s built FE, and used these same metaphors in a book chapter when describing the impact of restrictive covenants placed on the sites of former grocery stores (del Canto & Engler-Stringer, 2018). Looking back, I would have used language like ‘areas of high or low healthy food access,’ rather than rely on pejorative land metaphors, to convey systemic inequity.

I have applied my doctoral research to my own community, co-founding the City Centre Food Co-op (CCFC), a non-profit cooperative in Saskatoon that was established when the last grocery store downtown closed in 2015 (Shop Easy in City Park). We led lobbying efforts to remove the restrictive covenant on the site of the grocery store, and we have conducted market research on the feasibility and sustainability of different food store models in our neighbourhood. I participated in a market-sounding consultation, led by the City of Saskatoon, to offer my perspectives on the viability of grocery stores downtown. These experiences have shaped my approach to this research, which is reflected in how the analyses of this study have been interpreted and written up. It is for these reasons that I have mentioned my experiences here.

### 5.5.1 Changes to food environment assumptions

In the 1990s, a Scottish public housing resident described her neighborhood to an ethnographer as a “food desert” (Cummins and Macintyre 2002, p. 436), which is considered to be the earliest reference to this type of land-based FE metaphor, and which has since contributed significantly to FE discourse and constructs of the built FE. Unpacking the food desert concept has led to a range of “critical evidence-based assessment” studies, as well as a range of sharp critiques (Teigen & Jess, 2019).

Between 2010 and 2020, retail FE research grew as a field of study that combined aspects of nutrition, like food security and diet quality, with health outcomes at an environmental level. Health outcomes of interest focused on chronic conditions such as cardiovascular disease and obesity, both of which were irrefutably linked to diet and physical activity. Through an ecological, upstream research lens, greater emphasis in retail FE research was placed on policy and legal implications to improve health outcomes (Lytle, 2009; Lytle & Sokol, 2017).

Many, study designs (including this one) relied on GIS-based assessments to characterize the density, diversity and distribution of food stores in neighbourhoods. Retail FEs were deemed favourable or unfavourable according to how many supermarkets or convenience stores were in the area. The logic was predicated on the notion that immediate environments had immediate influence or, put another way, things that are closer together are more related than things that are further apart. These tenets of geography perpetuated an assumption - now understood to be a

serious over-simplification - that people are limited to shopping at the stores within their immediate neighbourhood. More broadly, such models also assume that there is uniformity across people and places with similar characteristics, which has also become understood to be a significant over-simplification. Not all low income individuals shop or eat the same way, nor do all individuals living in a low income neighbourhood shop or eat the same way.

At first, the impetus for action was grounded in improving health outcomes for nutrition-related health conditions, such as diabetes and cardiovascular disease. The link between nutrition and health is undeniable (Devine, 2005; Leone et al., 2011), but making evident the causal links between health, nutrition and environment is an ongoing challenge for FE research. Using an obesity-focused approach to study the impact of the built environment on population level health initially served as a useful way to conceptualize broader systemic health challenges. A focus on obesity required an evidence base that linked features of the built FE (proximity to grocery stores or fast food outlets, for instance) to nutrition-related health outcomes (Burgoine et al., 2013; Clary et al., 2017; Clary et al., 2015; Gustafson et al., 2011). The work of Egger and Swinburn (1997), for instance, examined how the outside environment got inside the human body to impact health outcomes. The language of obesogenic environments gained currency in FE research as a descriptor for communities awash in fast food or convenience store options and bereft of healthful options, such as a grocery store. If research could establish that environment directly affected obesity, then the argument for more supermarkets could be made.

Supermarkets were widely considered to be the healthiest food store type because they were assumed to have the largest array of fresh foods available for purchase for the lowest price. However, supermarkets also carry a large array of unhealthy foods, and some convenience stores may carry a large array of fresh, whole foods. It was further thought that justifying a need for more supermarkets would be based on sound evidence that could 'democratize' the built environment, regardless of the well-established economic and racial inequities. (Aggarwal et al., 2014). By situating these arguments within a capitalist framework of corporate-led food access, the illusion of choice that supermarkets perpetuated would be justified.

But researchers noted mixed findings in their search for food deserts in Canada (Apparicio et al., 2007; Black et al., 2011; Larsen & Gilliland, 2008; Minaker et al., 2016; Smoyer-Tomic et al., 2006) making the connections between obesity and built environment features tenuous at best. When this present study began, the term *obesogenic* was pervasive in

the literature. However, simply living near many convenience stores does not cause obesity – purchasing unhealthy foods does. Deficits-based obesity-focused approaches obfuscate the importance of broader food system issues, such as food insecurity, food sovereignty, and critical examinations of how food is marketed to people (Jackson, 2018). Emphasizing obesity within assessments of built FEs pathologizes an inherently political situation (Davis et al., 2018). To that end, I have modified my language to more accurately reflect the intentions of my research, which was to examine the intersections between retail environment experiences, the labour of foodwork and narratives of personal FEs.

### 5.5.2 Model of Community Nutrition Environments

There were strengths and limitations to the use of Glanz et al.'s Model of Community Nutrition Environments (Glanz et al., 2007). This model was among the first to make explicit the interactions between environmental and individual influences and was useful to initially categorize elements of the FE (between store and within store attributes, marketing and home environments). For the purposes of this study, the Glanz model helped to conceptualize various dimensions of the FE that were directly experienced through shopping for food and did so by outlining and creating tools to measure in-store environments. However, there were limitations when centering FE research within the Model of Community Nutrition Environments. By stratifying micro- and macro-level dimensions of the FE, it could be argued that this research - like other FE studies of the time - perpetuated the dichotomy between environment and individual level responsibility. While the Glanz model acknowledges the policy impact of governments and (corporate) industry, it visually reflected only a small portion of FE conceptualization. The model instead emphasized how individuals interacted directly with environmental variables. Despite the environmental nomenclature, the model was very individually-focused. It has been critiqued as ingenuous under neoliberalism in that it propagates an idealized FE that doesn't accurately reflect the extent of market control on foodwork (Winson, 2013).

## 5.6 Strengths

This study used an approach that moved beyond counting different types of food retailers in a geographic area and equating these measures to individual-level food access (Fuller, Engler-Stringer, & Muhajarine, 2016). At the time, this study was among the first in Canada to combine qualitative and quantitative data to understand the Consumer and Community FEs. The range of quantitative and qualitative data collected made this one of the first studies to explore the intersection between survey- and interview-based assessments of the retail FE and was one of the few studies of this type in Canada that focused on mothers. Objective measures of Consumer FE constructs (choice and price), and Community FE constructs (density, diversity and distribution of foods stores), were combined with perceptual assessments of affordability and accessibility.

At the time this study began, it was common for FE research to focus on low-income neighbourhoods and low-income families (Darmon & Drewnowski, 2008; Drewnowski & Darmon, 2005; Elliott & Bowen, 2018; Kirkpatrick & Tarasuk, 2011; Travers, 1996). That focus was, and remains, an important lens for assessing equitable food access. Many reasons have been described throughout this dissertation that emphasize the importance of supporting low income families' access to food. Low income families often experience an intersection of social determinant of health inequities, such as housing instability co-occurring with food insecurity. A narrow SES focus, however, can hide food access issues in neighbourhoods of higher SES, where residents may not be considered 'at risk' (Williams et al., 2012). Measures of income do not always convey the particular situation of individual households, nor provide a subjective assessment of people's situations (Oldroyd, Burns, Lucas, Haikerwal, & Waters, 2008). For instance, scholars such as DeVault (1991), Sobal and Bisogni (2009), and Johnson et al (2010), who have extensively examined women's roles in nutrition, found that families with relatively high incomes sometimes reported financial pressures that affected food purchasing and consumption behaviours. A higher income may indicate improved financial access to healthier foods, but it may not automatically translate to an increased budget for food. For instance, debt and other financial obligations may mean that less money is available for food costs. Examining shopping and eating experiences across a range of neighbourhoods helped to add nuance to influences on perception. Even within neighbourhoods, there are household-level variations in SES, highlighting the ecological fallacy of relying on large measurement units to assess

perceptions of the built FE. By including an even distribution of participants in high, mid and low SES neighbourhoods through rigorous sampling, this study captured some of the complexities beyond SES that could influence where people shopped and what they bought. The findings and analyses of interview themes made it clear there were heterogenous approaches to foodwork and to navigating the retail FE.

Further to this ecological fallacy, findings from all three interview approaches demonstrated that participants did the majority of their shopping outside of their neighbourhood of residence. Like Drenowski et al. (2014), this study found that shoppers were willing to travel longer distances to shop at the supermarket of their choice, or shop at stores within or near the boundaries of their activity space.

This study added to previous findings of inequity in Saskatoon (Kershaw et al., 2010; Lemstra et al., 2007; Peters & McCreary, 2008), supporting efforts to address population-level food insecurity in the city using an upstream approach. A strength of this study was that it represented a complete census of supermarkets and conveniences stores in the city's residential neighbourhoods. Based on the findings of this study and my research on restrictive covenants (del Canto & Engler-Stringer, 2018), it is clear that corporate practices are areas in need of further inquiry in Saskatoon. This is particularly relevant given the small number of corporations that control the majority of the city's retail FE, as well as the differences in price noted in different locations of the same supermarket chain.

## 5.7 Limitations

This study had a number of limitations. The cross-sectional nature of this study, despite the collection of data from different sources, meant that variations over time were not captured. Photovoice interviews were conducted over the winter months, which meant that many of the photos focused on snow and winter-related conditions. It cannot be ascertained from those interviews how perceptions may differ in warmer weather, such as how seasonal perceptions may influence store choice.

Census data used to characterize neighbourhood-level SES was from 2011. Were this study to be repeated with more recent data, neighbourhoods will likely be categorized by SES differently, resulting in different findings of neighbourhood-level affordability and accessibility.

There would likely be more variation in the Community FE than described in this paper, since several stores have shuttered their doors and several new stores have opened since NEMS-S data was collected. With inflation, measures of the Consumer FE, such as the price of the indicator foods, have likely risen.

Mothers are an important food-purchasing population, but there are many others whose perspectives and perceptions are important to understand. Even among the population of mothers in Saskatoon, this study was limited by a near complete sample of people who owned a vehicle. Understanding the perspective and perceptions of people without vehicles will yield meaningful insights of relational geography.

Though all supermarkets in residential neighbourhoods were measured, the relatively small number (n=24) made it difficult to assess relationships with neighbourhood-level SES. This initial analysis was, admittedly, a rudimentary first glimpse of Saskatoon's retail FE. More telling relationships would emerge with further examination of individual-level SES and other demographic factors within neighbourhoods.

The category of specialty food stores, which included 'ethnic' grocery stores, were excluded from this analysis, and may have led to an under-reporting of overall fruit and vegetable access in neighbourhoods, particularly in neighbourhoods without a supermarket. However, it is worth noting that the produce available in these stores (such as taro roots, plantains and mangoes) was not captured in the measurement tool, and likely resulted in an artificially low fruit and vegetable access score for the neighbourhoods in which the stores were located. Stores requiring membership, such as Costco, were also excluded. Warehouse formats offer a relatively wide array of fresh and frozen produce and excluding them from quantitative Consumer FE analysis contributed to an under-reporting of fruit and vegetable access. Given how often participants referenced Costco, it was clear that this was an important food store in the landscape of personal FEs.

*Quality*, one of three metrics of the NEMS-S survey tool, was excluded from further analysis due to its subjective nature. Quality described the desirability of a produce item, such as whether it was free from spoilage, bruises or other characteristics that would discourage purchase. Unlike price and availability, however, measures of quality were based on the perceptions of each rater and, as such, posed a challenge to objective interpretation. The significance of quality as a dimension, however, was apparent in the interview data. Participants

spoke of favouring certain stores with produce they perceived to be of better quality (looked fresher, lasted longer in the fridge, etc.). They also spoke of quality, implicitly, when describing in-store environments. Quality in this context could be associated with the positive store attribute described earlier, like clean aisles and appealing arrangements of fruits and vegetables. Future research, then, must find a way to incorporate quality as a key FE construct, recognizing that qualitative assessments are appropriate to understanding quality's subjective and relational nature.

### 5.7.1 Biases

There were several sources of bias in this study: selection, respondent and interviewer.

#### 5.7.1.1 Selection bias

Invitations were sent to families who had participated in the diet assessment of the *Smart Cities, Healthy Kids* study, and it could be surmised that this was a sample of people with a pre-existing interest in health, and who would therefore be more likely to participate in a study about FEs. Further, many participants were clustered in the same neighbourhood. I tried as much as possible to stratify the sample, but it was difficult to avoid overlap within the pool of mothers who agreed to participate. Nevertheless, stratification facilitated a nuanced approach to examining foodwork.

#### 5.7.1.2. Respondent bias

Amid the societal pressures of motherhood and foodwork, many participants engaged in defensive mothering, as was discussed earlier in this chapter. Previous research has shown that parents may be likely to over-report healthy food and under-report unhealthy food consumption since no one wants to be perceived as a bad parent (Fielding-Singh, 2017a; Muntaner et al., 2010; Parsons, 2016). There was also potential for recall bias when participants described what they ate or bought days or weeks ago.



### 5.7.1.3 Interviewer bias

I endeavoured to find a balance between neutral interviewing and creating a genuine relationship of trust with participants. This proved to be the most challenging during the go-along interviews. I wanted to create a natural-seeming shopping environment for participants and observe as unobtrusively as possible. During those interviews, participants and I spoke casually about foods that we liked or disliked and traded cooking ideas. These types of conversations were not part of participants' regular shopping routine but were used here to elicit complex details of quotidian foodwork (DePoy & Gitlin, 2005). Undoubtedly, my presence affected how each mother shopped that day, and this is accounted for in my narrative descriptions. However, I posit that maintaining casual conversation and attending to the social exchange between myself and each participant made it easier to uncover foodwork insights (Creswell, 2007).

## 5.8 Summary

This study found co-occurrences of low supermarket access and high convenience store access in central neighbourhoods of older urban design. Neighbourhoods experiencing built FE inequity were also sites of health inequities, reinforcing the evidence that place-based disparities exist in Saskatoon (Cushon et al., 2013; Kershaw et al., 2010; Lemstra & Neudorf, 2008; Peters & McCreary, 2008). But it was difficult to assess the impact of such an environment among a highly mobile population, as was the case with participants in this study.

The co-occurrence of many convenience stores and few supermarkets within the same neighbourhood must be addressed through policy to tackle the broad impacts on local residents' ability to access nutritious and affordable foods. With the baseline characteristics established in this dissertation, further research could incorporate in-situ qualitative data from people without vehicles or with reduced mobility to assess perspectives of disparate store type access. As noted earlier, it is important to widen the scope beyond low SES neighbourhoods. Focusing solely on low SES neighbourhoods misses the intra-neighbourhood variation that exists. Not all residents of low SES neighbourhoods experience material or social

marginalization and, conversely, some residents of high SES neighbourhoods may experience less obvious marginalization.

This study confirmed that store choice and food provisioning practices were the result of multi-faceted and complex foodwork influences that changed over the life course (Ben-shlomo & Kuh, 2002; Bernard et al., 2007; Devine, 2005). Drawing from structuration theory to demonstrate the mutually constitutive nature of people and places (Slater et al., 2012), this study demonstrated the recursive relationship between agent and structure: participants affected, and were affected by, their built FE in ways that were highly personal. The routines of practice I observed among go-along interview participants were a visible manifestation of this recursive relationship. Food shopping was a routinized activity for many participants, yet no two participants had the exact same routine.

By better understanding perspectives of the retail FE among a key food-purchasing population, combining qualitative and quantitative assessments is critical to developing effective interventions aimed at improving healthy eating. Participants' insights reveal that public health interventions could benefit from understanding the impact of busy schedules, perceptions of price and the foodwork behind efforts to provide health food for households. Urban planning benefits from an understanding of activity space impact on food purchasing decisions, and this study contributes evidence in support of in-fill development and highlights challenges presented with sprawl neighbourhood design. Further, with this study's findings, both public health interventions and urban planning policies can support more context-specific FE interventions to increase their likelihood of success.

## 5.9 Conclusion

The findings from this study provided further evidence of place-based health inequities in Saskatoon's low SES neighbourhoods, but also uncovered experiences of food insecurity in mid and high SES neighbourhoods. This study looked at the ways in which mothers of varying SES navigated affordability and accessibility within her retail FE. Themes of convenience and comfort characterized experiences of Consumer and Community FEs. Both convenience and comfort were informed by participants' activity spaces and relational perceptions of distance. Routines of practice informed narratives of the personal FE, demonstrating the influence of

perceptions on the push-pull of stores that participants shopped at. Despite changes to the field of FE research since this study was initially undertaken, this dissertation demonstrated the utility of combining quantitative and qualitative data to examine built FE perceptions. A particularly useful method in this study was the go-along interview, an in-situ or place-based inquiry that offered deep insights into the less tangible influences of Consumer and Community FEs. The combination objective and subjective assessments – such as surveys and interviews of store attributes, respectively – within the retail FE highlighted the relational nature of built FE experiences. Population-level interventions benefit from combining spatial experiences with fixed census and survey measures. This study demonstrated discordance between objective and subjective assessments and presented the importance of understanding how policies are experienced in order for them to be effective and sustainable.

Integrating measures of price, availability and food store distribution with assessments of foodwork experiences uncovered perceptions that mothers of adolescent children had when navigating their retail FE. The detailed description of study design and reflections on these combined measures added to the evidence supporting greater use of mixed methodology study design in FE research.

# Appendices

Appendix A: Neighbourhood Rankings and Mean NEMS-S Scores

<b>Neighbourhood</b>		<b>Mean NEMS-S</b>
<b>High SES</b>		
1	The Willows	0.00
2	Willowgrove	0.00
3	Lakeridge	0.00
4	Erindale	19.00
5	Silverspring	0.00
6	Arbor Creek	0.00
7	Westview	14.5
8	Briarwood	0.00
9	University Heights Suburban Centre	19.4
10	Silverwood Heights	17.00
11	Lakeview	25.00
12	Wildwood	25.25
13	Varsity View	15.00
14	Montgomery Place	19.00
15	Adelaide/Churchill	22.50
16	River Heights	26.33
17	Hampton Village	0.00
18	Nutana Park	12.00
19	Grosvenor Park	26.25
20	Lawson Heights	0.00
<b>Mid SES</b>		
21	College Park East	13.5
22	Parkridge	0.00
23	Greystone Heights	27.25
24	Pacific Heights	0.00

25	Buena Vista	2.00
26	Stonebridge	24.50
27	Dundonald	19.00
28	Forest Grove	16.00
29	Avalon	23.00
30	Eastview	13.00
31	Brevoort Park	3.00
32	Holliston	17.67
33	Confederation Park	17.50
34	Westmount	17.00
35	College Park	21.00
36	Queen Elizabeth	15.00
37	Haultain	10.50
38	Nutana	16.14
39	Fairhaven	18.00
40	North Park	19.00
Low SES		
41	Hudson Bay Park	21.50
42	Lakewood Suburban Centre	31.00
43	Exhibition	24.50
44	Sutherland	16.50
45	Richmond Heights	0.00
46	Meadowgreen	25.00
47	Massey Place	14.00
48	Lawson Heights Suburban Centre	20.86
49	Mayfair	10.50
50	Caswell Hill	7.75
51	City Park	26.50
52	Mount Royal	18.00
53	King George	16.00

54	Kelsey - Woodlawn	10.50
55	Central Business District	15.00
56	Holiday Park	0.00
57	Riversdale	14.00
58	Nutana Suburban Centre	16.50
59	Confederation Suburban Centre	17.33
60	Pleasant Hill	13.00

## Appendix B: Recruitment letter for sit-down interviews

Name of prospective participant

[Date]

Address

Dear [name],

This fall your child participated in the Smart Cities, Healthy Kids: Food Environments project by completing two questionnaires. The goal of our project is to understand how kids from different neighbourhoods eat and what kind of access they have to food stores.

The next phase of our research involves interviews with you and your child about your access to food in Saskatoon. We will conduct an interview with you and your child separately that asks you questions about where you live and what you think about your ability to access healthy food in your neighbourhood. We anticipate that the interview will last no longer than 1½ hours.

We anticipate the questions will not cause undue physical or emotional stress. All interview data will be kept confidential and only the research team will have access to your name and statements together. After the interview participants will have the opportunity to review a transcript of their interview so that they may approve, change, or remove any of their responses. All materials pertaining to interviews (tapes, digital recordings, hard copies of transcripts, electronic files on disk) will be stored in the office of the principal investigator in a locked cabinet. All materials will be destroyed no later than three years after the end of this project, except in the case that anonymity is compromised, in which case study results and associated materials will be stored for a minimum of five years by a faculty member at the University of Saskatchewan.

We will select participants from those who express interest in this study. If you are interested in participating, please contact Rachel Engler-Stringer (966-7839; Rachel.engler-stringer@usask.ca) or Tracy Ridalls (966-2237; tracy.ridalls@usask.ca). If you have any



questions or concerns about this study, please contact Nazeem Muhajarine or the University of Saskatchewan Research Ethics Office (966-2084).

Attached is a summary of this information.

Thank you.

Rachel Engler-Stringer, PhD, Assistant Professor in Community Health and Epidemiology,  
University of Saskatchewan

Tracy Ridalls, MA, Qualitative Researcher, SPHERU, University of Saskatchewan

You are invited to participate in a research study called:  
Smart Cities, Healthy Kids: Food Environments

What is it?

- We are currently evaluating the food environments of Saskatoon neighbourhoods.

Why?

- Our goal is to address the question: How do children in grades 5 - 8 and their parents perceive the accessibility, availability and quality of the food in their home neighbourhoods?

Who is doing the research?

- A team of people from the University of Saskatchewan
- Rachel Engler-Stringer, PhD, is the lead researcher
- Tracy Ridalls, MA, is coordinating this study

What will be involved?

- We are asking for your participation in an interview where we will ask you and your child a number of questions for the purpose of understanding your experiences with food

in your home neighbourhood. We anticipate that the interview will last no longer than 1½ hours.

#### Potential concerns

- We anticipate the questions will not cause undue physical or emotional stress
- All interview data will be kept securely and only the researchers directly involved in collecting and analyzing data will have access to these data
- We will keep your identity private, no information will be directly or indirectly linked to you

We will select participants from those who express interest in this study. If you are interested in participating, please contact:

Tracy Ridalls by telephone at 966-2237 or by email at [tracy.ridalls@usask.ca](mailto:tracy.ridalls@usask.ca)

or

Rachel Engler-Stringer by telephone at 966-7839 or by email at [rachel.engler-stringer@usask.ca](mailto:rachel.engler-stringer@usask.ca)

If you have any questions or concerns about this study, please contact Rachel Engler-Stringer (966-7839) or the University of Saskatchewan Research Ethics Office (966-2975).

Thank-you for considering participating in this research.

Appendix C: NEMS-S scoring

Item	Availability of Healthier Item	Avail Total Points	Price	Price
	Quality	Quality		
	Total Points			
Milk	YES low-fat/skim = 2 pts		Lower for lowest-fat = 2 pts	
	Same for both = 1 pt			
	Higher for low-fat = -1 pt			
	Proportion (lowest-fat to whole) $\geq 50\%$ = 1 pt			
Fruits	0 varieties = 0 pts			
	$\leq 6$ varieties = 1 pt			
	7-12 varieties = 2 pts			
	13 varieties = 3 pts		25-49% acceptable = 1 pt	
	50-74% acceptable = 2 pts			
	75%+ acceptable = 3 pts			
Frozen Fruit	0 varieties = 0 pts			
	1-2 varieties = 1 pt			
	3 varieties = 2 pts			
Canned Fruit	0 varieties = 0 pts			
	1-3 varieties = 1 pt			
	3 varieties = 2 pts		**Lower for water/no added sugar = 2pts	
	Higher for water/no added sugar = -1pt			

$\geq 2$  varieties packed in water with no added sugar = 1 pt

Vegetables	0 varieties = 0 pts			
	$\leq 6$ varieties = 1 pt			
	7-11 varieties = 2 pts			
	12 varieties = 3 pts		25-49% acceptable = 1 pt	
	50-74% acceptable = 2 pts			
	75%+ acceptable = 3 pts			

Frozen Vegetables 0 varieties = 0 pts  
1-3 varieties = 1 pt  
4 varieties = 2 pts

Canned Vegetables 0 varieties = 0 pts  
1-3 varieties = 1 pt  
4 varieties = 2 pts \*\*Lower for no added salt = 2 pts  
Higher for no added salt = -1 pt

≥ 1 varieties without added salt = 1 pt

Ground Beef YES lean meat = 2 pts Lower for lean meat = 2 pts  
Higher for lean meat = -1 pt

Hot dogs YES fat-free = 2 pts  
Light, not fat-free = 1pt Lower for fat-free or light = 2 pts  
Higher for fat-free or light = -1 pt

Frozen dinners YES all 3 reduced-fat types = 3 pts  
YES 1 or 2 reduced-fat types = 2 pts \*Lower for reduced-fat = 2 pts  
Higher for reduced-fat = -1 pt

Baked goods YES low-fat items = 2 pts Lower for low-fat (per piece) = 2 pts  
Higher for low-fat (per piece) = -1 pt

Beverages YES diet soda = 1 pt Lower for diet soda = 2 pts  
YES 100% juice = 1 pt Higher for 100% juice = -1 pt

Bread YES whole grain bread = 2 pts Lower for whole wheat = 2 pts  
Higher for whole wheat = -1 pt

>2 varieties whole wheat bread = 1 pt

Baked chips YES baked chips = 2 pts \*\*Lower for baked chips = 2 pts  
Higher for baked chips = -1 pt

> 2 varieties baked chips = 1 pt

Cereal YES healthier cereal = 2 pts  
\*\*Lower for healthier cereal = 2 pts

Higher for healthier cereal=-1 pt

Availability Subtotal=

Price Subtotal=

Quality Subtotal=

Total NEMS Store Score =

## Appendix D: Letter for food store managers

January 24th, 2011

Dear Manager:

Our project group at the Saskatchewan Population Health and Evaluation Research Unit at the University of Saskatchewan is visiting restaurants in your area to measure the foods that people in this neighborhood have available to them. Members of our project team are visiting restaurants to look at certain things such as the menu and signage.

We are not inspectors or evaluators, nor are we connected with your competitors. We follow strict rules to protect any information we collect. We will assign an identification (ID) number to your restaurant, and only the project staff will see your individual information. Information about your restaurant will be combined with others before it is shared outside, and the name of your restaurant will not be used.

Thank you for allowing us to spend a few minutes in your restaurant, recording this information. We may wish to schedule a time to ask you additional questions. Your participation is voluntary, and you may inform us at any time if you do not wish to participate. If you have questions or concerns, please contact me at 966-2237.

Best regards,

Tracy Ridalls, M.A.

Project Coordinator – Smart Cities, Healthy Kids

SPHERU – University of Saskatchewan

## Appendix E: Sit-down interview guide

### Section 1 - Background

1. Who lives in your household and what are their ages? Their occupation(s)?
2. What is the name of your neighbourhood and how long have you lived here?
3. Why did you move to this neighbourhood?
4. Do you know any of your neighbours?
5. Is there a neighbourhood that you would rather live in? Why?
6. Is there a neighbourhood that you would not want to live in? Why?
7. What do you like best about this neighbourhood? What do you like least?

### Section 2

8. Do you ever walk or bike to the grocery store? If no, why not? If yes, is there anything that makes walking/biking a challenge? What would make it easier for you or encourage you to walk/bike to the grocery store?
9. Which store(s) do you shop at? (If a chain store, ask which location). Why? Are there some that you shop at more often than others? Do you have main and/or top-up stores? Can you tell me about them? (Main: primary food store; top-up: where food bought in-between trips to main store)
10. What is your favourite grocery store? Why is it your favourite?
11. Are there stores that you avoid? Why?
12. What is the closest grocery store to you? Do you shop there?
13. Is it important for you to have a grocery store nearby (in your neighbourhood)? Why?
14. How often do you shop for groceries? Does how you shop change throughout the year (eg. seasonally or by holidays?)
15. Is there a time of day or day of the week that you prefer to shop? Is there a time of day or day of the week that you avoid shopping?

16. Do you always do the grocery shopping? If not, who else? Does anyone ever go with you?  
Do you have grocery shopping responsibilities for anyone outside of your household?
17. Describe a trip to the store. How do you get there? Do you plan what you are going to buy?  
Do you have strategies for working your way through the store?
18. What are the most important foods that you like to have in the house at all times? Where do you go to get those?
19. What does healthy eating mean to you?
  - a. Do you feel that eat healthy? Why or why not? What are some challenges/obstacles to healthy eating for you? What helps you to eat healthfully?
  - b. Do you feel that your family/household eats healthfully?
20. Does anyone in your house have any special food needs?
21. Do you make special trips to particular stores to get particular foods?
22. How many different types of vegetables do you buy? How many and how often? Why?
23. Where do you prefer to buy your vegetables? Why?
24. Can/do you buy vegetables from the stores in your neighbourhood?
25. Do you have a vegetable garden or participate in a community garden? Do you (or does someone in your family) provide food through hunting or fishing? Do you do canning or preserving? Do you bake? Does that affect how you shop for groceries?
26. Is the way you access food different than the way your parents accessed food? Did your parents garden/hunt/fish/can/preserve/bake?
27. Do you think that your kids eat differently than how you ate when you were that age? Is the way you eat now different than the way that you ate as a child?

### Section 3

28. Is there any particular food your child asks you to buy them? Why do you think they ask for that (those) food(s)?
29. How much television does your child watch? How do the shows your child(ren) watch(es) affect the kinds of foods they ask for?
30. How often do you eat out as a family? How often do you eat out as individuals? Where do you eat out? Are there any restaurants that you would not eat at?
31. Are there any rules around eating in your home?



32. Are there any restricted foods in your household? Does anyone have any special health needs or restrictions?
33. Tell me about a typical dinner meal in your house. What is it like? Where in the house do you eat?
34. Do you eat together as a family? How often? For which meals? Do you think that affects how you shop for groceries or the food that you buy?
35. Do you include your child/ren when shopping for food? Do you include your child/ren when preparing/cooking food? If so, how? Is it important to you to include them?
36. Is your spouse involved in any aspect of grocery shopping or meal preparation? If so, how?
37. Do you have strategies for preparing and storing meals, such as shopping in bulk or freezing batches? Do these strategies affect where you shop for food?

Is there anything that I haven't asked about your food shopping or preparation that you would like to tell me about?

Thank you for your time and your contribution to this research study. In the next phase of this study, we will be using photo-voice (explain) to ask participants more about their grocery shopping patterns. Is this something that you might be interested in doing?

## Appendix F: Photo-Voice Interview Guide

In order to find out more about the day-to-day aspects of your home and neighbourhood that affect your grocery, shopping, eating, etc, I would like it if you would carry around this camera for about a week. Please take pictures of anything that you think is important to show us how you view the food that is accessible within your neighbourhood and the city as whole. For example:

1. After a “major” or one of your main grocery trips, take a picture of the food that you bought before you put them away (all of them together).
2. Take pictures of things that make grocery shopping easier
3. Take pictures of things that make grocery shopping a challenge.
4. Take a picture(s) of ways that you travel to your main grocery store and other stores
5. Take pictures of some of your favourite places in Saskatoon to get food (stores and restaurants).
6. Take pictures of some of what you think are the best places in your neighbourhood to get food (stores and restaurants).
7. Take pictures of some of what you think are the worst places in your neighbourhood (stores and restaurants) to get food.
8. Take pictures of stores that you would like to shop at, but currently do not.
9. Take pictures of healthy foods in your house.
10. Take pictures of unhealthy foods in your house.
11. Take pictures of thing(s) that make it hard to eat healthy.
12. Take pictures of things that makes you want to eat healthy
13. Take pictures of how your children affect food purchasing (stores and restaurants)

### Some things to keep in mind

- Please carry the camera with you at all times – you never know when inspiration will strike!
- Do not take pictures inside stores (unless you have the written permission of the store manager)

- Do not take pictures of peoples' faces (if you would like to, we will need a photo-release form from them. Please let me know if this is something that you will need)
- Please feel free to call or email me any time if you have any questions, if anything is unclear or if you're unsure about something:

Sugandhi

Tel: 261-3130

Email: [sugandhi.delcanto@usask.ca](mailto:sugandhi.delcanto@usask.ca)

Thank you so much for your participation and for helping us out with this project. It is greatly appreciated!

## References

- Abeykoon, H., Engler-Stringer, R., & Muhajarine, N. (2017). Health-related outcomes of new grocery store interventions: a systematic review. *Public Health Nutrition*, 20(12), 2236–2248. <https://doi.org/10.1017/S1368980017000933>
- Aggarwal, A., Cook, A. J., Jiao, J., Seguin, R. a, Vernez Moudon, A., Hurvitz, P. M., & Drewnowski, A. (2014). Access to supermarkets and fruit and vegetable consumption. *American Journal of Public Health*, 104(5), 917–923. <https://doi.org/10.2105/AJPH.2013.301763>
- Allcott, H., Handbury, J., Schnell, M., Bitler, M., Case, A., Cuberes, D., ... Diamond, R. (2018). *Food deserts and the causes of nutritional inequity*. Cambridge, MA. Retrieved from <http://www.nber.org/papers/w24094%0ANATIONAL>
- Andress, L., & Fitch, C. (2016). Juggling the five dimensions of food access: Perceptions of rural low income residents. *Appetite*, 105, 151–155. <https://doi.org/10.1016/j.appet.2016.05.013>
- Apparicio, P., Cloutier, M.-S., & Shearmur, R. (2007). The case of Montréal's missing food deserts: evaluation of accessibility to food supermarkets. *International Journal of Health Geographics*, 6, 4. <https://doi.org/10.1186/1476-072X-6-4>
- Attorp, A., Scott, J. E., Yew, A. C., Rhodes, R. E., Barr, S. I., & Naylor, P.-J. (2014). Associations between socioeconomic, parental and home environment factors and fruit and vegetable consumption of children in grades five and six in British Columbia, Canada. *BMC Public Health*, 14(1), 150. <https://doi.org/10.1186/1471-2458-14-150>
- Beagan, B. L., Chapman, G. E., & Power, E. (2018). The visible and invisible occupations of food provisioning in low income families. *Journal of Occupational Science*, 25(1), 100–111. <https://doi.org/10.1080/14427591.2017.1338192>
- Belon, A. P., Nieuwendyk, L. M., Vallianatos, H., & Nykiforuk, C. I. J. (2016). Perceived community environmental influences on eating behaviors: A Photovoice analysis. *Social Science & Medicine*, 171, 18–29. <https://doi.org/10.1016/j.socscimed.2016.11.004>
- Ben-shlomo, Y., & Kuh, D. (2002). EDITORIAL A life course approach to chronic disease epidemiology : conceptual models , empirical What is a Life Course Approach to Chronic, (Figure 2), 285–293.
- Bernard, P., Charafeddine, R., Frohlich, K. L., Daniel, M., Kestens, Y., & Potvin, L. (2007). Health inequalities and place: a theoretical conception of neighbourhood. *Social Science & Medicine* (1982), 65(9), 1839–1852. <https://doi.org/10.1016/j.socscimed.2007.05.037>
- Bisogni, C. A., Connors, M., Devine, C. M., & Sobal, J. (2002). Who We Are and How We Eat: A Qualitative Study of Identities in Food Choice. *Journal of Nutrition Education and Behavior*, 34(3), 128–139. [https://doi.org/10.1016/S1499-4046\(06\)60082-1](https://doi.org/10.1016/S1499-4046(06)60082-1)
- Black, J. L., Carpiano, R. M., Fleming, S., & Lauster, N. (2011). Exploring the distribution of food stores in British Columbia: associations with neighbourhood socio-demographic factors and urban form. *Health & Place*, 17(4), 961–970. <https://doi.org/10.1016/j.healthplace.2011.04.002>
- Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*. Routledge Classics.
- Brady, J., Parker, B., Belyea, S., & Power, E. (2018). Filling our plate: A spotlight on feminist food studies. *Canadian Food Studies / La Revue Canadienne Des Études Sur l'alimentation*, 5(1), 1. <https://doi.org/10.15353/cfs-rcea.v5i1.308>

- Breyer, B., & Voss-Andreae, A. (2013). Food mirages: Geographic and economic barriers to healthful food access in Portland, Oregon. *Health and Place*, 24, 131–139. <https://doi.org/10.1016/j.healthplace.2013.07.008>
- Buhler, S. (2010). Canadian NEMS Store Survey. Retrieved November 21, 2011, from [/www.med.upenn.edu/nems/materials/](http://www.med.upenn.edu/nems/materials/)
- Burgoine, T., Alvanides, S., & Lake, A. A. (2013). Creating “obesogenic realities”; do our methodological choices make a difference when measuring the food environment? *International Journal of Health Geographics*, 12(1), 33. <https://doi.org/10.1186/1476-072X-12-33>
- Carpiano, R., & Daley, D. M. (2006). A guide and glossary on post-positivist theory building for population health. *Journal of Epidemiology and Community Health*, 60(7), 564–570. <https://doi.org/10.1136/jech.2004.031534>
- Carpiano, R. M. (2009). Come take a walk with me: the “go-along” interview as a novel method for studying the implications of place for health and well-being. *Health & Place*, 15(1), 263–272. <https://doi.org/10.1016/j.healthplace.2008.05.003>
- Caspi, C. E., Kawachi, I., Subramanian, S. V., Adamkiewicz, G., & Sorensen, G. (2012). The relationship between diet and perceived and objective access to supermarkets among low-income housing residents. *Social Science & Medicine*, 75(7), 1254–1262. <https://doi.org/10.1016/j.socscimed.2012.05.014>
- Charreire, H., Casey, R., Salze, P., Simon, C., Chaix, B., Banos, A., ... Oppert, J.-M. (2010). Measuring the food environment using geographical information systems: a methodological review. *Public Health Nutrition*, 13(11), 1773–1785. Retrieved from [http://journals.cambridge.org/cyber.usask.ca/abstract\\_S1368980010000753](http://journals.cambridge.org/cyber.usask.ca/abstract_S1368980010000753)
- City of Saskatoon. (2015). Population Growth and Rate of Change. Retrieved January 1, 2016, from <https://www.saskatoon.ca/city-hall/our-performance/performance-dashboard/sustainable-growth/population-growth-and-rate-change>
- Clark-Ibanez, M. (2004). Framing the Social World With Photo-Elicitation Interviews. *American Behavioral Scientist*, 47(12), 1507–1527. <https://doi.org/10.1177/0002764204266236>
- Clary, C., Augustus Matthews, S., & Kestens, Y. (2017). Between exposure, access and use\_ Reconsidering foodscape influences on dietary behaviours. *Health & Place*, 44, 1–7. <https://doi.org/10.1016/j.healthplace.2016.12.005>
- Clary, C. M., Ramos, Y., Shareck, M., & Kestens, Y. (2015). Should we use absolute or relative measures when assessing foodscape exposure in relation to fruit and vegetable intake? Evidence from a wide-scale Canadian study. *Preventive Medicine*, 71, 83–87. <https://doi.org/10.1016/j.ypmed.2014.11.023>
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE Publications: Thousand Oaks, California.
- Creswell, J. W., & Plano Clark, V. . (2011). *Designing and conducting mixed methods research* (2nd ed.). SAGE Publications: Thousand Oaks, California.
- Crouch, M., & McKenzie, H. (2006). Trend report Etat de la question The logic of small samples in interview-based The logic of small samples in interview-based qualitative research qualitative research. *Social Science Information*, 45(4), 483–499. <https://doi.org/10.1177/0539018406069584>
- Cushon, J., Creighton, T., Kershaw, T., Marko, J., & Markham, T. (2013). Deprivation and food access and balance in Saskatoon, Saskatchewan. *Chronic Diseases and Injuries in Canada*,

- 33(3), 146–159.
- Darmon, N., & Drewnowski, A. (2008). Does social class predict diet quality? *Am J Clin Nutr*, 87(5), 1107–1117. Retrieved from <http://ajcn.nutrition.org/cgi/content/long/87/5/1107>
- Davis, T., Hogg, M. K., Marshall, D., Petersen, A., & Schneider, T. (2018). Intersectional research stories of responsabilising the family for food, feeding and health in the twenty-first century. *European Journal of Marketing*, 52(12), 2273–2288. <https://doi.org/10.1108/EJM-06-2018-0394>
- del Canto, S., Engler-Stringer, R., & Muhajarine, N. (2015). Characterizing Saskatoon’s food environment: A neighbourhood-level analysis of in-store fruit and vegetable access. *Canadian Journal of Urban Research*, 24(1).
- del Canto, Sugandhi, & Engler-Stringer, R. (2018). Prohibitive property practices: The impact of restrictive covenants on the built food environment. In A. Gray & R. Hinch (Eds.), *A Handbook of Food Crime: Immoral and Illegal Practices in the Food Industry and What to do about them* (pp. 141–155).
- Delormier, T., Frohlich, K. L., & Potvin, L. (2009). Food and eating as social practice-- understanding eating patterns as social phenomena and implications for public health. *Sociology of Health & Illness*, 31(2), 215–228. <https://doi.org/10.1111/j.1467-9566.2008.01128.x>
- Desjardins, E. (2010). *Place and Food: A Relational Analysis of Personal Food Environments, Meanings of Place and Diet Quality*. Wilfrid Laurier University.
- DeVault, M. L. (1991). *Feeding the family: the social organization of caring as gendered work*. Chicago: University of Chicago Press.
- Devine, C. M. (2005). A Life Course Perspective: Understanding Food Choices in Time, Social Location, and History. *Journal of Nutrition Education and Behavior*, 37(3), 121–128. [https://doi.org/10.1016/S1499-4046\(06\)60266-2](https://doi.org/10.1016/S1499-4046(06)60266-2)
- Díez, J., Valiente, R., Ramos, C., García, R., Gittelsohn, J., & Franco, M. (2017). The mismatch between observational measures and residents’ perspectives on the retail food environment: A mixed-methods approach in the Heart Healthy Hoods study. *Public Health Nutrition*, 20(16), 2970–2979. <https://doi.org/10.1017/S1368980017001604>
- Drewnowski, A., & Barratt-Fornell, A. (2003). Do Healthier Diets Cost More ? *Nutrition Today*, 39(4), 161–168.
- Drewnowski, A., & Darmon, N. (2005). The economics of obesity: dietary energy density and energy cost. *The American Journal of Clinical Nutrition*, 82(1 Suppl), 265S-273S. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/16002835>
- Egger, G., & Swinburn, B. (1997). An “ecological” approach to the obesity pandemic. *British Medical Journal*, 315(7106), 477(4).
- Elinder, L. S., & Jansson, M. (2009). Obesogenic environments--aspects on measurement and indicators. *Public Health Nutrition*, 12(3), 307–315. <https://doi.org/10.1017/S1368980008002450>
- Elliott, S., & Bowen, S. (2018). Defending Motherhood: Morality, Responsibility, and Double Binds in Feeding Children. *Journal of Marriage and Family*, 80(2), 499–520. <https://doi.org/10.1111/jomf.12465>
- Elton, S. (2019). Reconsidering the retail foodscape from a posthumanist and ecological determinants of health perspective: wading out of the food swamp. *Critical Public Health*, 29(3), 370–378. <https://doi.org/10.1080/09581596.2018.1468870>
- Engler-Stringer, R., Muhajarine, N., Le, H., del Canto, S., & Ridalls, T. (2014). Characterizing

- the Food Environment in Saskatoon for Families with Children : Research Methods and Descriptive Results. Retrieved from [http://www.spheru.ca/publications/files/FINAL Food Environment Technical Report.pdf](http://www.spheru.ca/publications/files/FINAL_Food_Environment_Technical_Report.pdf)
- ESRI. (n.d.). GIS Dictionary. Retrieved December 18, 2014, from [http://support.esri.com/en/knowledgebase/GISDictionary/term/Tobler's First Law of Geography](http://support.esri.com/en/knowledgebase/GISDictionary/term/Tobler's%20First%20Law%20of%20Geography)
- Feng, J., Glass, T. A., Curriero, F. C., Stewart, W. F., & Schwartz, B. S. (2010). The built environment and obesity: a systematic review of the epidemiologic evidence. *Health & Place, 16*(2), 175–190. <https://doi.org/10.1016/j.healthplace.2009.09.008>
- Fetters, M., Curry, L., & Creswell, J. (2013). Achieving integration in mixed methods designs – Principles and practices. *Health Services Research, 48*(6), 2134–2156.
- Fielding-Singh, P. (2017a). A Taste of Inequality: Food's Symbolic Value across the Socioeconomic Spectrum. *Sociological Science, 4*(May), 424–448. <https://doi.org/10.15195/v4.a17>
- Fielding-Singh, P. (2017b). Dining with dad: Fathers' influences on family food practices. *Appetite, 117*, 98–108. <https://doi.org/10.1016/j.appet.2017.06.013>
- Filomena, S., Scanlin, K., & Morland, K. B. (2013). Brooklyn, New York foodscape 2007–2011: A five-year analysis of stability in food retail environments. *International Journal of Behavioral Nutrition and Physical Activity, 10*(1).
- Franco, M., Diez Roux, A. V., Glass, T. A., Caballero, B., & Brancati, F. L. (2008). Neighborhood characteristics and availability of healthy foods in Baltimore. *American Journal of Preventive Medicine, 35*(6), 561–567. <https://doi.org/10.1016/j.amepre.2008.07.003>
- Fuller, D., Engler-Stringer, R., & Muhajarine, N. (2016). Retail food environments research: Promising future with more work to be done. *Can J Public Health, 107*(Supplement 1), 68. <https://doi.org/10.17269/cjph.107.5622>
- Giddens, A. (1983). Comments on the Theory of Structuration. *Journal for the Theory of Social Behaviour, 13*(1), 75–80. <https://doi.org/10.1111/j.1468-5914.1983.tb00463.x>
- Giskes, K., van Lenthe, F., Avendano-Pabon, M., & Brug, J. (2011). A systematic review of environmental factors and obesogenic dietary intakes among adults: are we getting closer to understanding obesogenic environments? *Obesity Reviews, 12*(5), e95–e106. <https://doi.org/10.1111/j.1467-789X.2010.00769.x>
- Glanz K, Sallis J, Saelens B, F. L. (2007). NEMS-S Measurement Forms. *Amer J Prev Med.*
- Glanz, K. (2009). Measuring food environments: a historical perspective. *American Journal of Preventive Medicine, 36*(4 Suppl), S93-8. <https://doi.org/10.1016/j.amepre.2009.01.010>
- Glanz, K., Sallis, J. F., Saelens, B. E., & Frank, L. D. (2005). Healthy Nutrition Environments: Concepts and Measures. *American Journal of Health Promotion, 19*(5), 330–333. <https://doi.org/10.4278/0890-1171-19.5.330>
- Glanz, K., Sallis, J. F., Saelens, B. E., & Frank, L. D. (2007). Nutrition Environment Measures Survey in stores (NEMS-S): development and evaluation. *American Journal of Preventive Medicine, 32*(4), 282–289. <https://doi.org/10.1016/j.amepre.2006.12.019>
- Green, S. H., & Glanz, K. (2015). Development of the Perceived Nutrition Environment Measures Survey. *American Journal of Preventive Medicine, 49*(1), 50–61. <https://doi.org/10.1016/j.amepre.2015.02.004>
- Guest, G. (2013). Describing Mixed Methods Research: An Alternative to Typologies. *Journal of Mixed Methods Research, 7*(2), 141–151. <https://doi.org/10.1177/1558689812461179>

- Gustafson, A. a, Sharkey, J., Samuel-Hodge, C. D., Jones-Smith, J., Folds, M. C., Cai, J., & Ammerman, A. S. (2011). Perceived and objective measures of the food store environment and the association with weight and diet among low-income women in North Carolina. *Public Health Nutrition*, 14(6), 1032–1038. <https://doi.org/10.1017/S1368980011000115>
- Gustafson, A., Hankins, S., & Jilcott, S. (2012). Measures of the consumer food store environment: a systematic review of the evidence 2000-2011. *Journal of Community Health*, 37(4), 897–911. <https://doi.org/10.1007/s10900-011-9524-x>
- Handy, S. L., & Clifton, K. J. (2001). Local shopping as a strategy for reducing automobile travel, (1989), 317–346.
- Hausman, J., & Leibtag, E. (2007). CONSUMER BENEFITS FROM INCREASED COMPETITION IN SHOPPING OUTLETS : MEASURING THE EFFECT OF, 1177, 1157–1177. <https://doi.org/10.1002/jae>
- Health Canada. (2013). *Measuring the food environment in Canada*.
- Hessy-Biber, S. N., & Leavy, P. (2011). *The practice of qualitative research*. SAGE Publications: Thousand Oaks, California.
- Hill, J. O., Wyatt, H. R., Reed, G. W., & Peters, J. C. (2012). Obesity and the Environment : Where Do We Go from Here ? *Science*, 853(2003). <https://doi.org/10.1126/science.1079857>
- Hosler, A. S., & Dharssi, A. (2010). Identifying retail food stores to evaluate the food environment. *American Journal of Preventive Medicine*, 39(1), 41–44. <https://doi.org/10.1016/j.amepre.2010.03.006>
- Inglis, V., Ball, K., & Crawford, D. (2009). Does modifying the household food budget predict changes in the healthfulness of purchasing choices among low- and high-income women? *Appetite*, 52(2), 273–279. <https://doi.org/10.1016/j.appet.2008.10.005>
- Jackson, P., del Auguila, R.P., Clarke, I., Hallsworth, A., de Kervenoael, R., Kirkup, M. (2006). Retail restructuring and consumer choice 2. Understanding consumer choice at the household level. *Environment and Planning C: Government and Policy*, A(38), 47–67.
- Jackson, P. (2018). Familial fictions: families and food, convenience and care. *European Journal of Marketing*, 52(12), 2512–2520. <https://doi.org/10.1108/EJM-11-2017-0882>
- Jaffe, J., & Gertler, M. (2006). Victual Vicissitudes: Consumer Deskillling and the (Gendered) Transformation of Food Systems. *Agriculture and Human Values*, 23(2), 143–162. <https://doi.org/10.1007/s10460-005-6098-1>
- Jilcott, S. B., Laraia, B. A., Evenson, K. R., & Ammerman, A. S. (2009). Perceptions of the community food environment and related influences on food choice among midlife women residing in rural and urban areas: a qualitative analysis. *Women & Health*, 49(2–3), 164–180. <https://doi.org/10.1080/03630240902915085>
- Johnson, C. M., Sharkey, J. R., McIntosh, A. W., Dean, W. R., Campbell, K., Crawford, D., ... McBurney, D. (2010). I'm the Momma: Using photo-elicitation to understand matrilineal influence on family food choice. *BMC Women's Health*, 10(1), 21. <https://doi.org/10.1186/1472-6874-10-21>
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112–133.
- Kamphuis, C. B. M., Giskes, K., de Bruijn, G.-J., Wendel-Vos, W., Brug, J., & van Lenthe, F. J. (2006). Environmental determinants of fruit and vegetable consumption among adults: a systematic review. *British Journal of Nutrition*, 96, 620–635.
- Kamphuis, C. B. M., Jansen, T., Mackenbach, J. P., & Lenthe, F. J. Van. (2015). Bourdieu ' s Cultural Capital in Relation to Food Choices : A Systematic Review of Cultural Capital



- Indicators and an Empirical Proof of Concept. *PLoS ONE*, *10*(8), 1–19.  
<https://doi.org/10.1371/journal.pone.0130695>
- Kane, G. O., & Pamphilon, B. (2015). The importance of stories in understanding people's relationship to food: narrative inquiry methodology has much to offer the public health nutrition researcher and practitioner. *Public Health Nutrition*, *19*(4), 585–592.  
<https://doi.org/10.1017/S1368980015002025>
- Kelly, B., Flood, V. M., & Yeatman, H. (2011). Measuring local food environments: an overview of available methods and measures. *Health & Place*, *17*(6), 1284–1293.  
<https://doi.org/10.1016/j.healthplace.2011.08.014>
- Kershaw, T., Creighton, T., Markham, T., & Marko, J. (2010). *Food access in Saskatoon*.
- Kestens, Y., & Daniel, M. (2010). Social Inequalities in Food Exposure Around Schools in an Urban Area. *American Journal of Preventive Medicine*, *39*(1), 33–40.  
<https://doi.org/10.1016/j.amepre.2010.03.014>
- Khan, S., Calloway, S. A., Maida, T. I., & Rakel, D. P. (2012). Dietary and Built Environment Assessment in a Latino Community. *American Journal of Health Education*, *43*(2), 74–82.  
<https://doi.org/10.1080/19325037.2012.10599222>
- Kirkpatrick, S. I., & Tarasuk, V. (2011). Housing circumstances are associated with household food access among low-income urban families. *Journal of Urban Health : Bulletin of the New York Academy of Medicine*, *88*(2), 284–296. <https://doi.org/10.1007/s11524-010-9535-4>
- Kouri Research. (2013). *Towards a Food Strategy for Saskatoon: Saskatoon Regional Food System*.
- Lallukka, T., Laaksonen, M., Rahkonen, O., Roos, E., & Lahelma, E. (2007). Multiple socio-economic circumstances and healthy food habits. *European Journal of Clinical Nutrition*, *61*(6), 701–710. <https://doi.org/10.1038/sj.ejcn.1602583>
- Lamichhane, A. P., Warren, J., Puett, R., Porter, D. E., Bottai, M., Mayer-Davis, E. J., & Liese, A. D. (2013). Spatial patterning of supermarkets and fast food outlets with respect to neighborhood characteristics. *Health and Place*.  
<https://doi.org/10.1016/j.healthplace.2013.07.002>
- Larsen, K., & Gilliland, J. (2008). Mapping the evolution of “food deserts” in a Canadian city: supermarket accessibility in London, Ontario, 1961–2005. *International Journal of Health Geographics*, *7*, 16. <https://doi.org/10.1186/1476-072X-7-16>
- Last, J. M. (1988). *A Dictionary of Epidemiology* (2nd ed.). New York: Oxford University Press.
- Latham, J., & Moffat, T. (2007). Determinants of variation in food cost and availability in two socioeconomically contrasting neighbourhoods of Hamilton, Ontario, Canada. *Health & Place*, *13*(1), 273–287. <https://doi.org/10.1016/j.healthplace.2006.01.006>
- Le, H., & Muhajarine, N. (2013). City's planning eras: Designing neighbourhoods to promote physical activity in children in Saskatoon. *Journal of Epidemiology & Community Health*, *67*(4), E1.3-e1.
- LeDoux, T. F., & Vojnovic, I. (2013). Going outside the neighborhood: The shopping patterns and adaptations of disadvantaged consumers living in the lower eastside neighborhoods of Detroit, Michigan. *Health & Place*, *19*, 1–14.  
<https://doi.org/https://doi.org/10.1016/j.healthplace.2012.09.010>
- Leech, N. L., & Onwuegbuzie, A. J. (2009). A typology of mixed methods research designs. *Quality and Quantity*, *43*(2), 265–275. <https://doi.org/10.1007/s11135-007-9105-3>
- Lemstra, M, Neudorf, C., & Beaudin, G. (2007). Health disparity knowledge and support for

- intervention in Saskatoon. *Canadian Journal of Public Health*, 98(6).
- Lemstra, Mark, & Neudorf, C. (2008). *Health disparity in Saskatoon: Analysis to Intervention*.
- Leone, A. F., Rigby, S., Betterley, C., Park, S., Kurtz, H., Johnson, M. A., & Lee, J. S. (2011). Store type and demographic influence on the availability and price of healthful foods, Leon County, Florida, 2008. *Preventing Chronic Disease*, 8(6), A140. Retrieved from [/pmc/articles/PMC3221579/?report=abstract](http://pmc/articles/PMC3221579/?report=abstract)
- Lotoski, L. C., Engler-Stringer, R., & Muhajarine, N. (2015). Cross-sectional analysis of a community-based cooperative grocery store intervention in Saskatoon, Canada. *Can J Public Health*, 106(3), 147–154. <https://doi.org/10.17269/cjph.106.4710>
- Lytle, L. A. (2009). Measuring the food environment: state of the science. *American Journal of Preventive Medicine*, 36(4 Suppl), S134-44. <https://doi.org/10.1016/j.amepre.2009.01.018>
- Lytle, L. A., & Sokol, R. L. (2017). Measures of the food environment: A systematic review of the field, 2007–2015. *Health and Place*, 44(November 2016), 18–34. <https://doi.org/10.1016/j.healthplace.2016.12.007>
- Mahoney, M. J., & Granvold, D. K. (2005). Constructivism and psychotherapy. *World Psychiatry : Official Journal of the World Psychiatric Association (WPA)*, 4(2), 74–77. Retrieved from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1414735&tool=pmcentrez&rendertype=abstract>
- Martin, M. A., & Lippert, A. M. (2012). Feeding her children, but risking her health: the intersection of gender, household food insecurity and obesity. *Social Science & Medicine* (1982), 74(11), 1754–1764. <https://doi.org/10.1016/j.socscimed.2011.11.013>
- Masuda, J. R., Teelucksingh, C., Zupancic, T., Crabtree, A., Haber, R., Skinner, E., ... Fridell, M. (2012). Out of our inner city backyards: re-scaling urban environmental health inequity assessment. *Social Science & Medicine* (1982), 75(7), 1244–1253. <https://doi.org/10.1016/j.socscimed.2012.04.034>
- McEntee, J., & Agyeman, J. (2010). Towards the development of a GIS method for identifying rural food deserts: Geographic access in Vermont, USA. *Applied Geography*, 30(1), 165–176. <https://doi.org/10.1016/j.apgeog.2009.05.004>
- McKinnon, R. A., Reedy, J., Morrissette, M. A., Lytle, L. A., & Yaroch, A. L. (2009). Measures of the food environment: a compilation of the literature, 1990-2007. *American Journal of Preventive Medicine*, 36(4 Suppl), S124-33. <https://doi.org/10.1016/j.amepre.2009.01.012>
- Meah, A., & Jackson, P. (2017). Convenience as care: Culinary antinomies in practice. *Environment and Planning A*, 49(9), 2065–2081. <https://doi.org/10.1177/0308518X17717725>
- Minaker, L. M. (2016). Retail food environments in Canada: Maximizing the impact of research, policy and practice. *Can J Public Health*, 107, 1. <https://doi.org/10.17269/cjph.107.5632>
- Minaker, L. M., Raine, K. D., Wild, T. C., Nykiforuk, C. I. J., Thompson, M. E., & Frank, L. D. (2013). Objective food environments and health outcomes. *American Journal of Preventive Medicine*, 45(3), 289–296. <https://doi.org/10.1016/j.amepre.2013.05.008>
- Minaker, L. M., Shuh, A., Olstad, D. L., Black, J. L., Engler-Stringer, R., & Mah, C. L. (2016). Retail food environments research in Canada: a scoping review. *Canadian Journal of Public Health*. <https://doi.org/10.17269/cjph.107.5344>
- Morland, K., Wing, S., Roux, A. D., & Poole, C. (2002). Neighborhood Characteristics Associated with the Location of Food Stores and Food Service Places, 22(1).
- Morse, J. M. (2012). *Qualitative health research: Creating a new discipline*. Left Coast Press.

- Muntaner, C., Borrell, C., Vanroelen, C., Chung, H., Benach, J., Kim, I. H., & Ng, E. (2010). Employment relations, social class and health: a review and analysis of conceptual and measurement alternatives. *Social Science & Medicine (1982)*, *71*(12), 2130–2140. <https://doi.org/10.1016/j.socscimed.2010.09.038>
- Neale, J. (2016). Iterative categorization (IC): A systematic technique for analysing qualitative data. *Addiction*, *111*(6), 1096–1106. <https://doi.org/10.1111/add.13314>
- Oldroyd, J., Burns, C., Lucas, P., Haikerwal, A., & Waters, E. (2008). The effectiveness of nutrition interventions on dietary outcomes by relative social disadvantage: a systematic review. *Journal of Epidemiology and Community Health*, *62*(7), 573–579. <https://doi.org/10.1136/jech.2007.066357>
- Pampalon, R., Hamel, D., Gamache, P., Philibert, M. D., Raymond, G., & Simpson, A. (2009, April 30). An Area-based Material and Social Deprivation Index for Public Health in Québec and Canada. *Can J Public Health*. Retrieved from <http://journal.cpha.ca/index.php/cjph/article/view/3156>
- Pampalon, R., Hamel, D., Gamache, P., Philibert, M. D., Raymond, G., & Simpson, A. (2012). An area-based material and social deprivation index for public health in Québec and Canada. *Canadian Journal of Public Health = Revue Canadienne de Santé Publique*, *103*(8 Suppl 2), S17-22. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/23618066>
- Paquette, M. C. (2005). Perceptions of healthy eating: state of knowledge and research gaps. *Canadian Journal of Public Health = Revue Canadienne de Santé Publique*, *96*(S:15).
- Parsons, J. M. (2016). When convenience is inconvenient: ‘healthy’ family foodways and the persistent intersectionalities of gender and class. *Journal of Gender Studies*, *25*(4), 382–397. <https://doi.org/10.1080/09589236.2014.987656>
- Patton, M. (2001). *Qualitative research and evaluation methods* (2nd ed.). SAGE Publications: Thousand Oaks, California.
- Peters, E. J., & McCreary, T. A. (2008). Poor neighbourhoods and the changing geography of food retailing in Saskatoon, Saskatchewan, 1984–2004. *Canadian Journal of Urban Research*, *17*(1), 78–106.
- Popay, J. (2006). Whose theory is it anyway? *Journal of Epidemiology and Community Health*, *60*(7), 571–572. <https://doi.org/10.1136/jech.2005.038927>
- Pothukuchi, K. (2005). Attracting Supermarkets to Inner-City Neighborhoods: Economic Development Outside the Box. *Economic Development Quarterly*, *19*(3), 232–244.
- Price, J., Bridget, W., Jo, N., & Raul, K. (2017). The places parents go : understanding the breadth , scope , and experiences of activity spaces for parents. *GeoJournal*, *82*(2), 355–368. <https://doi.org/10.1007/s10708-015-9690-y>
- Public Health Agency of Canada. (2011). *Obesity in Canada: A joint report from the Public Health Association of Canada and the Canadian Institute for Health Information*.
- Raine, K. D. (2005). Determinants of Healthy Eating in Canada: An overview and synthesis. *Canadian Journal of Public Health*, *96*.
- Rosenkranz, R. R., & Dziewaltowski, D. A. (2008). Model of the home food environment pertaining to childhood obesity. *Nutrition Reviews*, *66*(3), 123–140. <https://doi.org/10.1111/j.1753-4887.2008.00017.x>
- Sadler, R. C., Gilliland, J. A., & Arku, G. (2015). Theoretical issues in the food desert: Debate and ways forward. *GeoJournal*, 443–455. <https://doi.org/10.1007/s10708-015-9634-6>
- Sanghavi, N., Smith, P., & Wills, G. (1989). Hypermarkets, discount stores and the corner shop: the changing nature of European food retailing. *Europe 2000*, *1*(5).

- Schubert, L., Gallegos, D., Foley, W., & Harrison, C. (2011). Re-imagining the ‘social’ in the nutrition sciences. *Public Health Nutrition*, *15*(02), 352–359. <https://doi.org/10.1017/S1368980011001297>
- Shelton, T. (2017). Spatialities of data : mapping social media ‘ beyond the geotag .’ *GeoJournal*, *82*(4), 721–734. <https://doi.org/10.1007/s10708-016-9713-3>
- Slater, J., Sevenhuysen, G., Edginton, B., & O’Neil, J. (2012). “Trying to make it all come together”: Structuration and employed mothers’ experience of family food provisioning in Canada. *Health Promotion International*, *27*(3), 405–415. <https://doi.org/10.1093/heapro/dar037>
- Smoyer-Tomic, K. E., Spence, J. C., & Amrhein, C. (2006). Food Deserts in the Prairies? Supermarket Accessibility and Neighborhood Need in Edmonton, Canada\*. *The Professional Geographer*, *58*(3), 307–326. <https://doi.org/10.1111/j.1467-9272.2006.00570.x>
- Smoyer-Tomic, K. E., Spence, J. C., Raine, K. D., Amrhein, C., Cameron, N., Yasenovskiy, V., ... Healy, J. (2008). The association between neighborhood socioeconomic status and exposure to supermarkets and fast food outlets. *Health & Place*, *14*(4), 740–754. <https://doi.org/10.1016/j.healthplace.2007.12.001>
- Spence, J. C., Cutumisu, N., Edwards, J., Raine, K. D., & Smoyer-Tomic, K. (2009). Relation between local food environments and obesity among adults. *BMC Public Health*, *9*, 192. <https://doi.org/10.1186/1471-2458-9-192>
- Springer, K. W., Hankivsky, O., & Bates, L. M. (2012). Gender and health: relational, intersectional, and biosocial approaches. *Social Science & Medicine (1982)*, *74*(11), 1661–1666. <https://doi.org/10.1016/j.socscimed.2012.03.001>
- Tashakkori, A., & Teddlie, C. (2003). *Handbook of mixed methods in social and behavioural research*. SAGE Publications: Thousand Oaks, California.
- Teigen, K., & Jess, D. M. (2019). Desert wonderings : reimagining food access mapping. *Agriculture and Human Values*, *36*(2), 241–256. <https://doi.org/10.1007/s10460-019-09914-5>
- Thompson, C., Cummins, S., Brown, T., & Kyle, R. (2013). Understanding interactions with the food environment: an exploration of supermarket food shopping routines in deprived neighbourhoods. *Health & Place*, *19*, 116–123. <https://doi.org/10.1016/j.healthplace.2012.10.003>
- Thornton, L. E., Pearce, J. R., Macdonald, L., Lamb, K. E., Ellaway, A., Richard, L., ... Macintyre, S. (2012). Does the choice of neighbourhood supermarket access measure influence associations with individual-level fruit and vegetable consumption? A case study from Glasgow. *International Journal of Health Geographics*, *11*(1), 29. <https://doi.org/10.1186/1476-072X-11-29>
- Townshend, T., & Lake, A. a. (2009). Obesogenic urban form: theory, policy and practice. *Health & Place*, *15*(4), 909–916. <https://doi.org/10.1016/j.healthplace.2008.12.002>
- Travers, K. D. (1996). The social organization of nutritional inequities. *Social Science & Medicine (1982)*, *43*(4), 543–553. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/8844955>
- Vogel, C., Abbott, G., Ntani, G., Barker, M., Cooper, C., Moon, G., ... Baird, J. (2019). Examination of how food environment and psychological factors interact in their relationship with dietary behaviours: Test of a cross-sectional model. *International Journal of Behavioral Nutrition and Physical Activity*, *16*(1), 1–17. <https://doi.org/10.1186/s12966->

019-0772-y

- Walker, R. E., Keane, C. R., & Burke, J. G. (2010). Disparities and access to healthy food in the United States: A review of food deserts literature. *Health & Place, 16*(5), 876–884. <https://doi.org/10.1016/j.healthplace.2010.04.013>
- Wang, H., Tao, L., Qiu, F., & Lu, W. (2016). The role of socio-economic status and spatial effects on fresh food access: Two case studies in Canada. *Applied Geography, 67*, 27–38. <https://doi.org/10.1016/j.apgeog.2015.12.002>
- Webber, C. B., Sobal, J., & Dollahite, J. S. (2010). Shopping for fruits and vegetables. Food and retail qualities of importance to low-income households at the grocery store. *Appetite, 54*(2), 297–303. <https://doi.org/10.1016/j.appet.2009.11.015>
- Widener, M. J. (2018). Spatial access to food: Retiring the food desert metaphor. *Physiology and Behavior, 193*(September 2017), 257–260. <https://doi.org/10.1016/j.physbeh.2018.02.032>
- Wilkins, E., Morris, M., Radley, D., & Griffiths, C. (2019). Methods of measuring associations between the Retail Food Environment and weight status: Importance of classifications and metrics. *SSM - Population Health*. <https://doi.org/10.1016/j.ssmph.2019.100404>
- Williams, L. K., Thornton, L., Ball, K., & Crawford, D. (2011). Is the objective food environment associated with perceptions of the food environment? *Ethics, 15*(2), 291–298. <https://doi.org/10.1017/S1368980011001947>
- Williams, P. L., Watt, C. G., Amero, M., Anderson, B. J., Blum, I., Green-lapierre, R., ... Lake, S. (2012). Affordability of a Nutritious Diet for Income Assistance Recipients in, (June).
- Willows, N., Veugelers, P., Raine, K., & Kuhle, S. (2011). Associations between household food insecurity and health outcomes in the Aboriginal population (excluding reserves). *Health (San Francisco), 82*.
- Winson, A. (2013). *The industrial diet: the degradation of food and the struggle for healthy eating*. UBC Press.
- World Health Organization. (n.d.). Double burden of malnutrition. Retrieved from <https://www.who.int/nutrition/double-burden-malnutrition/en/>
- Wright, J., Maher, J., & Tanner, C. (2015). Social class, anxieties and mothers' foodwork. *Sociology of Health and Illness, 37*(3), 422–436. <https://doi.org/10.1111/1467-9566.12202>
- Wrigley, N. (2002). "Food Deserts" in British Cities: Policy Context and Research Priorities. *Urban Studies, 39*(11), 2029–2040. <https://doi.org/10.1080/0042098022000011344>
- Zenk, S. N., Schultz, A. J., Israel, B. A., James, S. A., Bao, S., & Wilson, M. L. (2005). Neighborhood racial composition, neighborhood poverty, and the spatial accessibility of supermarkets in Metropolitan Detroit. *American Journal of Public Health, 95*(4), 660–667.
- Ziff, B. (2016). Bumble Bees Cannot Fly and Restrictive Covenants Cannot Run. In A. Smit & M. Valiante (Eds.), *Public Interest, Private Property: Law and Planning Policy in Canada*. UBC Press.