

Bringing Family Meals to Schools
A Qualitative and Quantitative Analysis

A Thesis
SUBMITTED TO THE FACULTY OF
UNIVERSITY OF MINNESOTA
BY

Jamie Elizabeth Street (Coborn)

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE

Teri Burgess-Champoux PhD, RD, LD Advisor

Leonard Marquart PhD, RD, Co-Advisor

June 2014

© Jamie Elizabeth Street (Coborn) 2014

Dedication

This thesis is dedicated to my husband, Eric Michael Coborn.

You inspire me everyday.

Table of Contents

DEDICATION	i
LIST OF TABLES	ii
LIST OF ABBREVIATION	vi
LIST OF DEFINITIONS	vii
Chapter I: Literature Review	1
Introduction.....	2
The National School Lunch Program: A Historical Perspective	6
Theoretical Framework: Social Ecological Model	13
Family-Style Meal Service	14
The Childcare Environment.....	14
The Home Environment.....	19
The Institutional Environment	26
The Nursing Home Environment.....	28
The School Foodservice Environment.....	33
Research Study Objectives	36
Chapter II, Phase I: Promoters, Barriers, and Perceptions to a Family-Style Meal Service in a School Foodservice Setting	37
Overview.....	38
Chapter II, Phase I Methods.....	39
Focus Group Study Design	39
Focus Group Participants	39
Focus Group Procedures and Data Collection	40
Focus Group Data Analysis	41
Individual Interview Participants.....	43
Individual Interview Procedures and Data Collection	43
Individual Interview Data Analysis	44
Results.....	45
Phase I, Focus Groups and Individual Interviews	45
Chapter III, Phase II: Survey of Foodservice Directors and School Administrators 60	
Chapter III, Phase II Methods.....	61
Study Design.....	61
Survey Development.....	61

Description of Survey Items	62
Knowledge	62
Level of Exposure	63
Attitudes	64
Interest/Motivation.....	65
Data Collection Procedures.....	66
Data Analysis	67
Results.....	68
Descriptive Results	68
Demographic Characteristics	68
Knowledge	69
Level of Exposure	70
Attitudes	71
Interest/Motivation.....	73
Exploratory Factor Analysis and Reliability Analysis.....	74
Knowledge	74
Attitudes.....	75
Interest/Motivation.....	76
Chapter IV: Discussion	85
Discussion	86
Conclusions.....	96
Implications for Future Research.....	97
References.....	99
Appendices:	108
Appendix A: Letter of Support from School Administration	109
Appendix B: Child Consent Form	111
Appendix C: Child Assent Form	114
Appendix D: Teacher Consent Form	116
Appendix E: Parent Consent Form	119
Appendix F: Demographic Survey	122
Appendix G: 3 rd and 4 th Grade Focus Group Questions	126
Appendix H: Teacher Focus Group Questions	128
Appendix I: Parent Focus Group Questions	130
Appendix J: Individual Interview Consent Form	133
Appendix K: Individual Interview Questions	136
Appendix L: Family Meals Survey.....	139
Appendix M: School Nutrition Association Consent Phone Script.....	152
Appendix N: Email to Survey Participants	154

List of Tables

Chapter II: Phase I- Focus Groups and Individual Interviews	Page number
Table 2-1: Characteristics of adult focus group participants.....	54
Table 2-2: Characteristics of individual interview participants.....	55
Table 2-3: Individual Level Emerging Themes and Supporting Quotes Revealed by Adult Focus Group and Individual Interview Participants.....	56
Table 2-4: Social Environmental Level Emerging Themes and Supporting Quotes Revealed by Adult Focus Group and Individual Interview Participants.....	57
Table 2-5: Physical Environmental Level Emerging Themes and Supporting Quotes Revealed by Adult Focus Group and Individual Interview Participants.....	58
Table 2-6: Macro- Environmental Level Emerging Themes and Supporting Quotes Revealed by Adult Focus Group and Individual Interview Participants.....	59
 Chapter III: Phase II- Survey of Food Service Directors and School Personal	
Table 3-1: Demographic Characteristics of Survey Participants.....	77
Table 3-2: Means and Standard Deviations for Knowledge Items.....	78
Table 3-3: Means and Standard Deviations for Attitude Items.....	79
Table 3-4: Means and Standard Deviations for Interest/Motivation Items.....	80
Table 3-5: Participants Interest and Receptiveness to the Application of a Family-style Meal Service in a School Foodservice Setting.....	81
Table 3-6: Participants Interest in Learning More About the Application of a Family-style Meal Service in a School Foodservice Setting.....	81
Table 3-7: Factor Patterns for Knowledge Items.....	82
Table 3-8: Factor Patterns for Attitude Items	82
Table 3-9: Factor Patterns for Attitude Items.....	83
Table 3-10: Factor Patterns for Interest/Motivation Items.....	84

List of Abbreviations

NSLP- National School Lunch Program

USDA- United States Department of Agriculture

SES- Socioeconomic Status

WHO- World Health Organization

NFSMI- National Food Service Management Institute

FFM- Frequency of Family Meals

OR- Odds Ratio

CI- Confidence Interval

BMI- Body Mass Index

AHS- Alternative High School

KJ- Kilojoules

RDA- Recommended Dietary Allowance

List of Definitions

Family-style meal service- family style meal service allows students to serve themselves from common dishes of food. Assistance is given from supervising adults and the supervising adult should initially offer the full planned serving of each food component/food item to each student. The supervising adult should encourage additional portions and selections as appropriate. Family style meal service allows students to make choices in selecting foods. Family style meal service must meet all of the daily and weekly food component/food item requirements, as well as the weekly dietary specifications. Since replenishment is immediately available at each table, the initial serving of a food component/food item may be less than the full-required minimum serving size (Food and Nutrition Services USDA, 2013-2014)

Biddy system- third and fourth grade children who assist with feeding the younger kids lunch using the family-style meal service in a school foodservice setting (Breck School Golden Valley, MN).

Chapter I
Literature Review

Introduction

Schools are widely recognized as suitable environments to implement interventions targeted towards improving the physical health of children. Historically, the most politically popular interventions have focused on school feeding programs (Alderman & Bundy, 2012). The earliest programs first appeared in the United States during the Progressive Era, the time period between 1890 and 1920. Local organizations and women's groups interested in children's welfare and education undertook these early programs. School feeding programs soon expanded into school foodservice settings with the establishment of school attendance compulsory laws (Poppendieck, 2009). Reformers realized a great need to ensure that children were fed during the school day as many were from low-income households. Overall, the goal of the expansion was to provide nutritious and safe meals to underprivileged children. Despite this goal, the concern and problem over hunger and malnutrition persisted.

World War II brought much attention to unemployment, hunger, and widespread despair. Young men were declared unfit for service after showing signs of malnutrition and physical deficiencies (VanEgmond-Pannell, 1981; Cain, 1984). Observed as a threat to National Security, and this coincided with the belief that these issues resonated from childhood, Congress emphasized in 1945, the need to ensure that all the Nation's children had access to nutritious foods (Cain, 1984). In 1946, Congress passed the National School Lunch Act, which authorized the National School Lunch Program (NSLP) (Cain, 1984; Gunderson, 2003). The purpose and philosophy of the program was, "to safeguard the health and well-being of the nation's children and to encourage the domestic

consumption of nutritious agricultural commodities and other food.” To achieve this goal, states were provided with support from the Federal government by the United States Department of Agriculture (USDA) to provide children of various socioeconomic statuses (SES) with access to nourishing meals at free or reduced prices.

The NSLP continued to expand in the years superseding 1946 due to numerous appropriations and reauthorizations by Congress. In 2012, the NSLP served school lunch to approximately 31 million children (USDA, 2012). The expansion of the program is encouraging; however, the changes responsible for the expansion have focused heavily on economics and supporting agriculture, while simultaneously nourishing children. Recently, due to the widespread distribution of the program, there has been greater emphasis on nutrition and the nutritional quality of food served but the optimal implementation is challenging. If the NSLP truly wants to promote, enhance, and improve the overall health and well-being of children, then an important consideration should not only be what children are served, but the environment in which they are served.

The Social Ecological Model (SEM) provides a theoretical foundation to describe how different environmental levels including the individual, social, physical, and macro level may influence behavior change. Beginning in the 1980’s, research first documented how manipulating the physical environment during mealtimes could increase verbal communication and eating behaviors among psychogeriatric patients (Melin & Götestam, 1981). In subsequent years the term “family-style meal service” was adopted to describe this manipulation and several research studies were conducted to investigate the use of a

family-style meal service in multiple environments including childcare settings (NFSMI, 2003; NFSMI, 2003; Sigman Grant, Christiansen, Branen, Fletcher & Johnson, 2008; Gable, 2001; Branen, Fletcher & Myers, 1997; Harnack, Oakes, French, Rydell, Farah & Taylor, 2012), the home environment (Gillman 2000; Neumark-Sztainer, Hannan, Story, Croll & Perry, 2003; Larson, Neumark-Sztainer, Hannan & Story, 2007; Burgess-Champoux, Larson, Neumark-Sztainer, Hannan & Story, 2009; Utter, Scragg, Schaaf & Mhurchu, 2008; Christian, Evans, Hancock, Nykjaer & Cade, 2013; Sen, 1997; Gillman, 2000; Taveras, 2005; Fulkerson, 2008; Snow, Catherine & Beals, 2006; Eisenberg, Olson, Neumark-Sztainer, Story & Bearinger, 2004; CASA, 2001; Eisenberg, Neumark-Sztainer, Fulkerson & Story, 2008; Fulkerson, Story, Mellin, Leffert, Neumark-Sztainer & French, 2006; Neumark-Sztainer, Eisenberg, Fulkerson, Story & Larson, 2008), nursing home settings (Elmståhl, Blabolil, Fex, Küller & Steen, 1987; Mathey, Vanneste, de Graaf, de Groot & van Staveren, 2001; Nijs, Siebelink, Blauw, Vanneste, Kok & Van Staveren, 2006; Nijs, Kok & Van Staveren, 2006; Altus, Engelman & Mathews, 2002; Barnes, Wasielewska, Raiswell & Drummond, 2013), and school foodservice settings (Cain, 1984; Donnelly, Jacobson, Legowski, Johnson & McCOY, 2000). Collectively, these studies suggest that the use of a family-style meal service develops healthy eating behaviors and practices within individuals while concurrently promoting the development of social and emotional health. To the best of our knowledge, only two studies have investigated a family-style meal service in a school foodservice setting (Cain, 1984; Donnelly et al. 2000). Based on this evidence, more research is needed to identify the

promoters, barriers, and perceptions to a family-style meal service in a school foodservice setting.

Grounded in the theoretical framework of the Social Ecological Model (Sallis, Owen & Fisher, 2008; Gregson et al. 2001; Story, Kaphingst, Robinson-O'Brien & Glanz, 2008) the primary aim of this thesis is to identify the promoters, barriers, and perceptions of a family-style meal service in a school foodservice setting. The thesis begins with a historical background on school lunch programs to properly depict the story of how the overarching goal of “improving the overall health and well-being of the Nation’s children” (Cain, 1984; Gunderson, 2003) became lost to economic and agricultural concerns (Levine, 2008).

The second part of the literature review will provide an overview of the Social Ecological model and then progress into a discussion of the research literature related to a family-style meal service. More specifically, this section will provide readers with a broad understanding of how the use of a family-style meal service in different environments promotes, enhances, and improves the health of individuals across the lifespan. Children’s health and the beneficial aspects associated with the use of a family-style meal service will first be discussed in the context of the childcare environment. Following this section will be a systematic, but not comprehensive review of the positive association between child and adolescent health and the frequency of family-meals in the home environment. The next section will describe how the use of a family-style meal service benefits elderly nursing home residents. Lastly, the literature review will

conclude with a discussion of the present research related to the use of a family-style meal service in a school foodservice setting.

The National School Lunch Program: A Historical Perspective

1890- 1930

School feeding programs first emerged in the United States during the Progressive Era, the time period between 1890 and 1920, and were undertaken by local organizations and women's groups who were interested in children's education and welfare (Gunderson, 2003; Texas Department of Agriculture, 2009). The transition of these early programs into the school environment occurred under the establishment of school compulsory attendance laws (Poppendieck, 2009). The laws mandated that children between the ages of 8 and 15 attend school for a certain portion of the year (Poppendieck, 2009). The passage of these laws resulted in more poor children attending school and reformers became concerned over the ability of children to focus during school lessons. Between 1892-1920, lunchrooms and feeding programs appeared in major cities across the United States including Philadelphia, Boston, Milwaukee, St. Louis, Cleveland, and Cincinnati (Gunderson, 2003; Texas Department of Agriculture, 2009). Funded at the state level, the programs were undertaken by home economics teachers, dietitians, or parent teacher associations (Carpenter, Hann & Yeatman, 1936) and met with high regard for their ability to benefit children both physically and mentally (Gunderson, 2003). Over the next decade, feeding programs continued to flourish and operate at the state level. Substantial changes did not occur until the onset of the Great Depression in the 1930's.

1930- 1942

The Great Depression brought about unemployment, hunger, and poverty. Major cities saw substantial decreases in purchasing power and farm production plummeted to the point that farms could no longer support their local communities (Texas Department of Agriculture, 2009). The culmination of these events called great attention to malnourishment and hunger, especially among school-aged children. For example, in 1936, the Columbia Daily Spectator featured an article where The Child Development Institute of Teachers College reported American children as weighing significantly less than they had five years prior (Columbia Spectator, 1936; Levine, 2008). Similarly, children in Louisiana were found to be malnourished (Levine, 2008) while 31 percent of children in Ohio were reportedly underweight and 85% of children in Vermont suffered from rickets (Levine, 2008). In order to improve children's health, assist struggling farmers, and reverse the increasing unemployment rates, the United States Federal Government would need to step forth and take action.

In 1935, Congress passed and approved the Agricultural Adjustment Act. The primary aim under the act's provision was to distribute surplus meats, dairy products, and wheat to schools in need (Pollitt, Gersovitz, & Gargiulo, 1978). A year later in 1936, Congress passed the Public Law of 320. The passage of the law allowed for the purchase of surplus foods on the market to help raise farm prices by using up purchased surplus through exports or by diverting the agricultural commodities from the normal channels of trade and donating them domestically (Gunderson, 2003; Texas Department of

Agriculture, 2009). That same year, Congress brought people back to the workforce by passing the Work Progress Authorization (WPA) (Texas Department of Agriculture, 2009). Overall, these Congressional acts benefited school feeding programs and led to their expansion during the Great Depression because schools received the surplus commodities provided under the passage of the Agricultural Adjustment Act in 1935 and the Public Law of 320 in 1936. Furthermore, the WPA provided schools with additional labor in the lunchrooms during the school day. By 1942, approximately 92,916 schools were serving meals to over 6 million children (Levine, 2008). Despite this expansion, school-feeding programs would experience change in the coming years.

1942- 1950

The year 1942 marked the United States entry into World War II. This national event changed the course of school feeding programs for two reasons. First, young men recruited into the armed forces were rendered unfit for service after failing physical draft requirements (Cain, 1982; Poppendieck, 2009). Secondly, similar to World War I, the end of World War II left American farmers with record surplus crops and farm leaders began to lobby for protection of agriculture. Congress once again recognized these issues and responded by passing the National School Lunch Act, which authorized the National School Lunch Program (NSLP). Signed on July 4, 1946 by President Harry S. Truman the purpose and philosophy of the act was, “ as a measure of national security, to safeguard the health and well-being of the nation’s children and to encourage the domestic consumption of nutritious agricultural commodities and other food, by assisting

the states, through grant-in-aid and other means, in providing an adequate supply of food and other facilities or the establishment, maintenance, operation and expansion of non-profit school lunch programs” (Gunderson, 2003).

Under the Act, State Education Departments became responsible for the distribution of funds to states based on the ratio between the poverty rate and number of school-aged children (Poppendieck, 2009). States that decided to participate in the NSLP agreed to do the following: 1) serve meals to needy children at free or reduced cost; 2) operate on a non-profit basis, maintain adequate records of all receipts and expenditures, and distribute commodities determined to be in large supply by the Secretary; and 3) serve meals meeting minimum nutritional requirements set forth by the Secretary of Agriculture (Gunderson, 2003).

1950-2012

From 1950 to 2012, several amendments occurred to the NSLP leading to the expansion of the program. Collectively, the primary emphasis of these amendments focused heavily on the economics of the NSLP. For example, the first amendment occurred in 1952. This amendment resulted in a change to the fund allocation formula in Hawaii, Guam, the Virgin Islands, and Puerto Rico (Gunderson, 2003). In 1962, Congress enacted numerous amendments under Sections 4, 11, and 6 of the Act. Section 4 was amended to resolve inequities between states regarding the distribution of funds. Under the new amendment participation and assistance need rates for each state were analyzed to determine fund allocation (Gunderson, 2003). The Section 11 amendment

provided states with cash reimbursement for meals served at free or reduced prices (Gunderson, 2003) and assistance was granted based on the following five factors: 1) the economic condition of the area from which the schools draw attendance; 2) the need for free or reduced-price lunches; 3) the percentage of free or reduced-price lunches being served in such schools; 4) the price of the lunch in such schools as compared with the average price of lunches served in the State; and 5) the need for additional assistance as evidenced by the financial position of the lunch program in such schools.

The final amendment occurred to Section 6 and stated the following: "National School Lunch Act the Secretary of Agriculture is authorized to use not to exceed one percent of the funds appropriated for the National School Lunch and the Child Nutrition Acts for training and education for workers, cooperators, and participants in these programs and for necessary surveys and studies of requirements for food service programs in furtherance of the purposes" (Gunderson, 2003). In the 1970's, the focus on economics continued beginning with state fund allocations being reduced. In 1975, food plate waste became a concern and thus, Offer versus Serve was implemented to combat, "the war on waste" (Cain, 1982). Offer versus Serve mandated that children be provided with the option to only take 3 of the 5 items offered through the NSLP program (Cain, 1984). From 1980-2012, states continued to see reductions in the amount of reimbursement received for meals served (School Nutrition Association, 2000-2014).

Aside from economics, a secondary concern associated with the NSLP program has been nutrition. Attention towards improving the overall nutritional quality of food served arose in 1966, when Congress enacted the Child Nutrition Act of 1966 (P.L. 80-

642, 1966; Gunderson, 2003). The efforts of the Act were intended to be “extended, expanded, and strengthened under the authority of the Secretary of State, to safeguard the health and well-being of the Nation’s children and encourage the domestic consumption of agricultural commodities,” (P.L. 80-642, 1966) and were established based on “nutritional research demonstrating the relationship between a child’s ability to learn and develop when provided food and good nutrition” (Gunderson, 2003; P.L. 80-642, 1966; Texas Department of Agriculture, 2009). The Act’s primary aim was to improve and meet the nutritional needs of children more effectively by taking control over the Special Milk and School Breakfast Programs (SBP), Summer and Childcare Programs, and Maternal and Infant Feeding Programs (Gunderson, 2003; P.L. 80-642, 1966; Pollitt, Gersovitz & Gargiulo, 1978).

Although the primary aim of the Child Nutrition Act of 1966 was to improve the nutritional needs of children, the Act also leveraged the ability to once again expand the program while also improving the economics of the NSLP. For example, section 13 of the Act provided the authority to place all school food service programs under the Department of Agriculture thus allowing for all school foodservice funds to be transferred from other agencies to the USDA (Gunderson, 2003; P.L. 89-642, 89th Congress, Oct. 11, 1966, 80 Stat. 885-890). Amendments to Section 7 allowed states to request additional funds for the purpose of employing additional staff to assist with serving school meals through the NSLP and SBP. However, requests were only granted after justification for the requested funds was presented by those states in need. Similarly, states could request funds for equipment purchases but were required to provide a

detailed summary of the equipment to be purchased and how the equipment would expand the NSLP and SBP (Gunderson, 2003).

In 1993, the USDA School Nutrition Dietary Assessment reported that school meals were too high in fat (School Nutrition Association, 2000-2014). In 1994, Section 19a of Public Law 103-448 under the Child Nutrition Act of 1966 underwent changes that primarily focused on improving the nutritional quality of school meals including aligning school meals to better meet the 1996 Dietary Guidelines for Americans (School Nutrition Association, 2000-2014). That same year, the USDA also created Team Nutrition and established the Healthy School Initiative in an effort to improve school lunches and increase children's knowledge of proper nutrition (School Nutrition Association, 2000-2014).

More recently, the "Healthy, Hunger Free Kids Act of 2010" (P.L. 111-296, 2010) was authorized, which resulted in the most substantial changes to the nutritional standards of school meals since the birth of the NSLP in 1946. Prior to the authorization of the Healthy, Hunger Free Kids Act of 2010, school meals were required to meet one third of a child's daily nutritional requirements (Gunderson, 2003). The authorization of the Healthy, Hunger Free Kids Act of 2010 specifically amended the NSLP to better align school meals with standards set forth by the 2010 Dietary Guidelines for Americans (USDA, 2012).

Additionally, the changes that resulted from the authorization of the Healthy, Hunger Free Kids Act of 2010 focused on five specific components including: 1) establishment of new rules and standards focused on requiring that all meals served under

the NSLP offer whole-grain foods, only fat-free or low-fat milk, and fruits and vegetables to children every day of the week while also reducing the amount of saturated fat, sodium, trans fat, and added sugars served; 2) improving the nutritional standards of foods offered through vending machines and other school campus venues; 3) providing an additional reimbursement of 6 cents to schools for each meal served in compliance with the new requirements; 4) provide schools with assistance and training and technical assistance to ensure proper compliance; and 5) establish common sense pricing standards to ensure non-federal sources align with federal costs and a commitment to serving of healthy school meals (USDA, 2012).

Theoretical Framework: Social Ecological Model

Researchers have traditionally examined factors related to behavior change, food choices, and eating behaviors of children through the application of theoretical frameworks. The Social Ecological Model (SEM) provides a theoretical foundation for identifying how different levels in the environment influence behavior change. The theory conceptualizes that environments are interconnected and illustrates how individuals and environmental contexts including the social, physical, and macro level environments interconnect and interact to influence behavior (Story et al. 2008). By using the social ecological model interventions can be developed to target change at multiple levels of influence (Sallis et al. 2008).

The first level refers to *individual* characteristics including knowledge, attitudes, beliefs and biological and demographic factors that may influence behavior change, food

choices, and eating behaviors (Story et al. 2008; Gregson et al. 2001). The second level, the *social environment* includes processes and primary groups (e.g. peers, friends, family, teachers, networks, associations). The individuals within the social environment may influence behavior by providing social identity or role definition. Furthermore, the individuals within the social environment may provide an impact through social support or the establishment of processes that initiate social norms and role modeling (Story et al. 2008). The third level, the *physical environment* includes such settings as worksites, schools, and home. The physical environment is also related to the physical settings within a community that impact barriers and opportunities for healthy eating and influence the accessibility and availability of food (Story et al. 2008). The fourth level, the *macro level environment* impacts behaviors from a more distal standpoint than the individual, social, or physical environments. The factors related to the macro level may include distribution systems, food and agricultural policies, government and political structures and policies, and societal or cultural norms (Story et al. 2008)

Family-Style Meal Service: The Childcare Environment

The USDA and other professional organizations including the American Public Health Association, the American Academy of Pediatrics, and the Academy of Nutrition and Dietetics widely endorse the use of a family-style meal service in childcare centers (Savage 2012). The rationale is that the method of service allows for development of healthy behaviors and eating practices; food preferences and self-regulation of energy intake; while also promoting the development of life skills including social and motor

skills (NFSMI, 2003; NFSMI, 2003; Sigman Grant et al. 2008; Gable, 2001; Branen et al. 1997; Harnack et al. 2012).

Development of healthy behaviors and eating practices

The family-style meal service may promote healthy development of behaviors and healthy eating practices in young children. Collectively, research suggests that this is achieved because the method of service provides opportunities for adult role modeling and adult-child interactions. Sigman Grant et al. (2008) surveyed front-line staff and directors from four western state childcare facilities to examine differences in mealtimes. Three mealtimes were identified and assessed for differences: 1) family-style meal service (children serve themselves from common bowls and platters); 2) pre-plated (food put onto plates); and 3) lunch box (some or all food brought from home). Although less than half of centers reported using the family-style meal service, a key finding was that the influence of adults to serve as role models to the children was increased through this method of service. Additionally, teachers reported trying new foods with children during the family-style meal service at a higher frequency (69%) compared to pre-plated (42%) and lunch box (40%) teachers. Furthermore, family-style meal service teachers reported talking to children more about food (95%) compared to pre-plated (79%) and lunchbox (77%) teachers (Sigman Grant et al. 2008).

Similarly, Gable (2001) reported an increase in adult role modeling through the use of a family-style meal service with young children. More specifically, the study reported that teachers promoted healthful learning practices in children by engaging in

positive versus negative nutrition behavior during mealtimes (Gable, 2001). Examples of positive practices included encouraging children to try new foods, teaching children the name of new foods, and actively engaging in conversations with the children (Gable, 2001). Overall the studies conducted by Sigman Grant et al. (2008) and Gable (2001) suggest that the family-style meal service may promote the positive development of eating behaviors in young children through the increased prevalence of adult role-modeling and the adult presence during mealtimes.

Self-regulation of food intake

Educational memos published by the National Food Service Management Institute (NFSMI) at the University of Mississippi (NFSMI, 2003) suggests that a positive association exists between the family-style meal service and self-regulation of food intake by children. The rationale is that allowing children to serve themselves and take responsibility for what and how much to eat supports the development of healthful consumption and self-regulation of energy intake (Mogharreban and Nahikiam-Nelms, 1996). Presently, two studies have investigated the effect of a family-style meal service versus a pre-portioned meal service on children's energy and nutrient intake during snack and mealtime (Brenan et al. 1997; Harnack et al. 2012). However, the results published are inconsistent and contradictory. In 1997, Brenan et al., aimed to determine differences between young children's food intake, plate waste, and time required to eat when served meals pre-portioned versus a family-style meal service. Forty children (male n=19; female n=21), ages 35-60 months were observed during 108 preschool snack time

sessions. The family-style meal service was used for 73 of the sessions, whereas the pre-portioned method was used one day a week, at random, for the remaining 35 sessions. Observational methods including videotaping and visual quantification were implemented to assess for differences in food intake, waste, and time to eat between the two serving methods. A significantly greater mean energy intake was reported among children served using the family-style meal service versus the pre-portioned method (1.46 ± 0.76 versus 1.03 ± 0.12 ; $p < .0001$), with the average difference being less than one-half more per child. No significant differences were reported for waste and time to eat.

In 2012, a study utilizing a randomized crossover experimental design evaluated the effect of a family-style meal service versus a pre-portioned method of service on preschool children's intake of nutrients and food including fruit and vegetables (Harnack et al. 2012). Fifty-three preschool aged children from a Head Start center located in Minneapolis, MN were observed at lunchtime over the course of six weeks. For two of the six weeks, fruit and vegetables were served pre-portioned by providers ahead of time during the family-style meal service. Two one-week controls were also implemented over the six-week period where all food items were served at once using only the family-style meal service. Analysis of the results concluded the following: 1) fruit intake was significantly higher (0.40 servings/meal versus 0.32 servings/meal; ($p < 0.01$) when served in advance of other menu items instead of in tandem during the use of a family-style meal service; and 2) there was a decrease in energy intake in children when served by the family-style meal service versus the pre-portioned method (223 kcals/meal versus 284 kcals/meal; $p < 0.001$) (Harnack et al. 2012). Compared to Brenan et al. (1997), this

study had notable strengths, which could explain the discrepancy in the reported results related to energy intake of children when fed by the family-style meal service versus the pre-portioned method. Strengths of this study included a larger sample size and use of randomization to reduce potential confounding. Additionally, it appeared that tighter controls, such as in-depth training of staff prior to observations was implemented for this study. Despite these strengths, both studies had inherent limitations such as inadequate statistical power due to smaller than normal sample sizes and limited generalizability due to observations occurring in only one center for each study. Lastly, because children's food intake was assessed through use of observational methods, the margin of error for measurement could be higher. Clearly more research is needed to determine the relationship between children's energy intake during use of a family-style meal service.

Development of motor and social skills

The National Food Service Management Institute at the University of Mississippi has published educational memorandums documenting children's development of motor and social skills with increased exposure to a family-style meal service in the childcare environment (NFSMI, 2003). The memorandums suggest that children develop motor skills by passing food around the table and using real silverware, dishes, and napkins during the family-style meal service. Secondary to these findings, the memos suggest that the development of children's social skills is positively enhanced through this method of service because childcare providers eat meals with the children. Thus, children are presented with more opportunities to converse with adults. The development of social

skills in children has also been documented in one research study. As previously discussed, the primary aim of the study conducted by Sigman Grant et al. (2008) was to assess differences in mealtime characteristics when childcare facilities served meals using either the family-style, pre-plated, or lunch box meal service. Analysis of survey results from staff also concluded that a majority (80%) could teach children motor skills and more importantly teach children table manners, conversational, and social skills when the family-style meal service was implemented (Sigman Grant et al. 2008).

Family Meals: The Home Environment

Dietary Behaviors

Frequency of family meals (FFM) has been associated with the dietary behaviors of adolescents. Overall, these studies suggest that a positive association exists between greater FFM and adolescent's intake of fruits, vegetables, grains, and key nutrients such as calcium, iron, folate, fiber, and vitamins C, E, and B₆ (Gillman et al. 2000; Neumark-Sztainer et al. 2003; Larson et al. 2007; Burgess-Champoux et al. 2009; Utter et al. 2008; Christian et al. 2013). For example, a cross-sectional study by Gillman et al. (2000) examined the association between adolescent dietary patterns and FFM. Dietary intake and FFM were measured by self-administered mailed surveys and semi-quantitative food frequency questionnaires. Subjects reporting a FFM as "most days" versus "never or some days" and "everyday" versus "most days," had a greater likelihood (OR 1.45; 95% [CI], 1.37-1.53) for consuming at least 5 servings of fruits and vegetables per day (Gillman et al. 2000). A study limitation mentioned by the authors was the

generalizability of the findings, as subjects were sons and daughters of registered nurses and primarily, white (Gillman et al. 2000). Similarly, another cross-sectional study (Neumark-Sztainer et al. 2003) examined the association between FFM and adolescent dietary patterns. Compared to the previous study, subjects of diverse racial and sociodemographic backgrounds were recruited and the final analysis adjusted for several sociodemographic characteristics (sex, school level, race, mother's employment status, and socioeconomic status (SES) (Neumark-Sztainer et al. 2003). Importantly, a positive association ($p < .002$) was reported between FFM meals and dietary intake of fruits, vegetables, grains, key nutrients (iron, folate, fiber, and vitamins C, E, B₆), and calcium-rich foods. Interestingly, both Gillman et al. (2000) and Neumark-Sztainer et al. (2003) reported an inverse association between soft drink consumption and FFM. In a 5-year longitudinal study, Larson et al. (2007) explored the relationship between the influences of FFM on meal pattern changes during the transition from adolescence to young adulthood (18-24 years). Authors reported that FFM during adolescence resulted in increased intakes of fruits ($p < 0.05$), vegetables ($p < 0.01$), dark-green and orange vegetables ($p = 0.0001$) and key nutrients (calcium, folate) and decreases in soft drink consumption ($p < 0.05$) during young adulthood (Larson et al. 2007). The positive influence of FFM on adolescent's dietary patterns has also been observed during the transition from early (middle school) to middle (high school) adolescence (Burgess-Champoux et al. 2009). More specifically, Burgess-Champoux et al. (2009) reported increased intakes of vegetables, calcium-rich foods, dietary fiber, and key nutrients including calcium, magnesium, potassium, and iron among adolescents who reported a

greater frequency of family meals 5 years prior. Although Larson et al. (2007) and Burgess-Champoux et al. (2009) found similar associations between FFM and adolescent dietary patterns, one inherent limitation of both studies was the use of self-reported data, which could result in study bias.

Weight Status

Several epidemiologic studies have examined the relationship between child and adolescent weight status and FFM. Collectively, these studies report a positive association between FFM and weight status but the influence varies by ethnicity and potential confounding covariates including socioeconomic status, age, maturational stage, baseline height, race/ethnicity, physical activity, inactivity, girl's menstrual stage, and energy intake (Sen 2006; Gillman et al. 2000; Taveras et al. 2005; Fulkerson et al. 2008). Sen (2006) used an ethnically diverse sample from the 1997 National Longitudinal Survey of Youth, a 3-year longitudinal study to investigate FFM and prevalence of overweight in adolescence. The study reported a positive association between FFM and weight status in non-Hispanic White but not Hispanic or Black adolescents. More specifically, non-Hispanic white adolescents reporting 3-4 and 5-6 family meals per week in 1999 showed a 66% (OR 0.34; 95% [CI], 0.11 to 0.98) and 80% (OR 0.20; 95% [CI], 0.06 to 0.59) reduction in the odds of becoming overweight in 2000 compared to those who reported no family meals per week. In a large national sample of 9-14 year old children, a cross-sectional analysis was conducted by Gillman et al. (2000) to explore the relationship between FFM and weight status. Subjects Body Mass Index (BMI) was

calculated based on self-reported height and weight. The study found age adjusted BMI to be lower (19.0 kg/m^2) among subjects reporting FFM “every day,” compared to those who reported FFM “most days” (19.2 kg/m^2) and “never or some days” (19.5 kg/m^2). Study limitations included not adjusting for potential confounding covariates, measuring for changes in BMI based on self-reported heights and weights, and using terms such as “most days,” “everyday,” and “never or some days,” rather than specific numbers of days per week to determine FFM.

A subsequent study by Taveras et al. (2005) aimed to expand on the work of Gillman et al. (2000) by conducting a cross-sectional and 1-year longitudinal analysis to investigate the association between FFM and prevalence of overweight in 9-14 year old adolescents. The cross-sectional analysis of results demonstrated a reduced prevalence of overweight for girls (16.7%) and boys (22.7%) who reported FFM “everyday,” compared to those who reported FFM “most days” (16.6% in girls and 23.3% in boys) and “never or some days” (19.4% in girls and 24.6% in boys) (Taveras et al. 2005). Despite these findings, the longitudinal results, which assessed FFM and 1-year prevalence of overweight, did not demonstrate any statistically significant associations. Compared to Gillman et al. (2000) study strengths included controlling for potential covariates such as socioeconomic status, age, maturational stage, baseline height, race/ethnicity, physical activity, inactivity, girls menstrual stage, and energy intake. Similar to Gillman et al. (2000) a study limitation included determining FFM by terms such as, “everyday,” “most days,” and “never or some days,” as opposed to using a specific number of days per week. Finally, the study by Fulkerson et al. (2008) assessed for cross-sectional and 5-year

longitudinal associations between overweight status and FFM. Similar to Taveras et al. (2005) potential covariates were controlled for using two models: 1) model 1- adjusted for baseline demographics; and 2) model 2- adjusted additionally for physical activity, sedentary behaviors, and energy intake. Analysis of all cross-sectional models resulted in significant inverse associations between FFM and overweight status in girls ($p < 0.001$) but not boys. No significant associations were reported for girls or boys after analysis of the 5-year longitudinal data.

Academic Success

Frequent family meals are suggested to be beneficial to the academic success of a child. Collectively, these studies have shown that a greater frequency in family meals has a positive influence on children's literacy and language development, grade point average, and test scores (Snow et al. 2006; Eisenberg et al. 2004; CASA, 2001). Literacy has been identified as the strongest predictor of a child's academic success (Werner & Smith, 1992; Bennett et al. 2006). Snow et al. (2006) evaluated the contribution of family mealtimes to children's linguistic and literary development. A total of 160 mealtime conversations from 68 different families were recorded. The age of children ranged from 3-5 years. As the children moved through their school years, progression of their language and literacy development was tested (Snow et al. 2006). A key finding was that children acquired vocabulary and general knowledge through family mealtime conversations. These findings suggest that children's literary development may be

positively enhanced through engagement in family mealtimes and participation in mealtime conversations.

Eisenberg et al. (2004) investigated the association between family meals and school performance. The authors reported a lower grade point average (OR 0.88; 95% [CI], 0.84-0.93) among boys and girls with a 1-unit difference in FFM. Likewise, a survey administered to teens, ages 12-17 and their parents through the National Center on Addiction and Substance Abuse at Columbia University found that teens were more likely to report A or B grades with a frequency of 5-7 family meals per week (CASA, 2001).

Psychosocial

FFM appears to be directly correlated to high-risk behaviors in youth. Collectively, studies report an inverse association between FFM and high-risk behaviors including depressive symptoms, substance use, and disordered eating (Eisenberg et al. 2004; Eisenberg et al. 2008; Fulkerson et al. 2006; Neumark-Sztainer et al. 2008). Two of the studies (Eisenberg et al. 2004; Eisenberg et al. 2008) investigated the influence of FFM on substance use and disordered eating among adolescents based on data from Project EAT (Eating Among Teens). Study methods have been described previously (Neumark-Sztainer et al. 2008). Eisenberg et al. (2004) explored the relationship between FFM, depressive symptoms, and use of cigarette, alcohol, and marijuana among adolescents. Greater FFM was significantly associated with lower odds of depressive symptoms, and cigarette, alcohol, and marijuana use (OR 0.68-0.85) (Eisenberg et al.

2004). Gender adjusted models for family connectedness; parent's marital status, school level, white race, and socioeconomic status reported a significant association between FFM and lower odds of cigarette use (OR 0.89; 95% [CI], 0.84-0.95), alcohol use (OR 0.91; 95% [CI], 0.85-0.97), and depressive symptoms (OR 0.93; [CI], 0.86-1.00) for boys (Eisenberg 2004). Girls reported lower odds of cigarette use (OR 0.84; 95% [CI], 0.78-0.89), alcohol use (OR 0.78; 95% [CI], 0.73-0.83), marijuana use (OR 0.76; 95% [CI], 0.71-0.83) and depressive symptoms (OR 0.92; 95% [CI], 0.87-0.98). A 5-year longitudinal analysis by Eisenberg et al. (2008) reported similar findings. Girls at follow-up who reported regular FFM at baseline had half the odds of using cigarettes (OR, 0.47; 95% [CI], 0.29-0.75), alcohol (OR 0.49; 95% [CI], 0.29-0.83), and marijuana (OR 0.49; 95% [CI], 0.26-0.93) compared to girls who reported not engaging in regular FFM at baseline (Eisenberg et al. 2008). No significant associations were found for boys in relation to FFM and use of cigarettes, alcohol, or marijuana. Similarly, Fulkerson et al. (2006) examined associations between FFM, depressive symptoms, and substance use in high-risk youth. Racially diverse adolescent subjects (n=145) from six alternative high schools (AHS) were asked to complete surveys. Analysis of the mixed-model logistic regression, adjusted for race/ethnicity, age, gender, SES, and random effects of school, reported an inverse relationship between FFM and depressive symptoms ($p < 0.05$). Furthermore, an observable trend ($p < 0.07$) was reported for decreased substance use among adolescents reporting 5-7 family meals per week compared to adolescents reporting no family meals per week. A subsequent study by Fulkerson et al. (2006) examined FFM with high-risk behaviors among adolescents (substance use and

depressive symptoms along with other high-risk behaviors including sexual activity, antisocial behaviors, violence, school problems, excessive weight-loss, and disordered eating (binge eating/purging). Briefly, the study reported an inverse relationship between FFM and all high-risk behaviors (OR 0.36-0.58). Finally, a longitudinal study by Neumark-Sztainer et al. (2008) assessed the association between FFM and disordered eating. Analysis of the results reported lower odds (OR 0.71; 95% [CI], 0.52-0.97) of disordered eating behaviors among girls who reported eating regular family meals (> 5 meals/week) five years prior.

Family-Style Meal Service: The Institutional Environment

Research from the early 1980's suggests that the use of a family-style meal service with institutionalized adults including psychogeriatric patients and patients with mental impairments, increases verbal communication, mealtime eating behaviors, and the amount of time spent eating during mealtimes. The earliest study conducted by Melin & Götestam (1981) aimed to investigate the effect of rearranging the physical environment during mealtime on psychogeriatric patient's verbal communication and eating behaviors. Utilizing a randomized control trial study design, 21 participants were randomized to either an experimental or control group. The traditional tray service was used to serve meals to the control group. Food served during mealtimes to the experimental group was placed on the table. Participants were allowed to serve themselves and provided with the option of sitting and eating together during mealtimes (Melin & Götestam, 1981). Analysis of the data concluded that rearranging the physical environment significantly

increased verbal communication among experimental group participants. Furthermore, these participants also exhibited improved eating behaviors including use of proper utensils, glassware, and napkins.

That same year, another study (VanBiervliet et al. 1981) was conducted to investigate the effect of physical environment mealtime alterations on verbal communication in five developmentally disabled institutionalized adults. Alterations to the physical environment were similar to Melin and Göttestam (1981) but the term family-style meal service was adopted to better explain these changes. Key findings suggested that the use of a family-style meal service with these participants increased peer-directed conversation during mealtimes and the amount of time spent with others. Furthermore, researchers observed that participants were more likely to spend time in the dining room with their meals during the use of a family-style meal service. The amount of time spent with meals by institutionalized participants during the use of a family-style meal service has been documented in one other research study. Doke et al. (1977) examined differences in the amount of time spent with meals for institutionalized adolescents when meals were served using a family-style versus a cafeteria-style meal service. Briefly, 15 participants were assigned to an experimental group and served meals using the family-style meal service, whereas 24 other participants were assigned to the control group and served meals using the cafeteria-style meal service. Following a time series lasting 30 days, the family-style meal service was compared twice to the cafeteria-style meal service on days 1-10 and 16-19 for mean differences in the amount of time participants spent with meals. Similar to VanBiervliet et al. (1987) the study reported an increase in

time spent with meals among participants of the family-style meal service (53%) versus participants of the cafeteria-style meal service (47%). Authors also reported the mean time in minutes spent with meals to be approximately double (41 minutes) for participants of the family-style meal service versus participants of the cafeteria-style meal service (23 minutes).

Family-Style Meal Service: The Nursing Home Environment

The use of a family-style meal service appears to enhance the overall health of elderly nursing home residents. Collectively, these studies suggest that energy intake, physical performance, social facilitation, and mealtime participation are increased and risk of malnutrition decreased in elderly nursing home residents through the use of a family-style meal service (Elmståhl et al. 1987; Mathey et al. 2001; Nijs et al. 2006; Altus et al. 2002; Barnes et al. 2013). Three studies have investigated the effect of a family-style meal service on elderly nursing home resident's energy intake during mealtimes. Elmstahl et al. (1987) investigated 16 patients, five males and 11 females (mean age 80.4 years, range 65-88 years) for changes in energy intake both pre and post intervention. Interventional changes included altering the environment during mealtimes to make the dining room appear more "home-like," whereby food was served on serving dishes and participants were allowed to serve themselves. A key finding was that energy and protein intake increased by 25% ($p < .001$). However, no significant changes in body weight were reported.

Contradictory to the previous study findings, Mathey et al. (2001) reported changes in body weight among Dutch nursing home elderly residents after implementing more “home-like” alterations to the mealtime environment. Utilizing a parallel design for one year, Dutch nursing home residents (n=38) were assigned to either a control or intervention group and assessed for changes in body weight, dietary intake, and quality of life. Changes to the ambience of mealtime were improved for the intervention group by decorating the dining tables with plates and table cloths, placing food on serving platters at the center of tables and allowing participants to serve themselves while also having continuous access to coffee, tea, and fruit juice. Upon completion of the 1-year intervention, significant increases in body weight ($+3.3\text{kg} \pm 5.0$, $p < 0.05$; $n=12$), trending towards weight gain were reported among the intervention group participants, whereas body weight for the control group remained stable ($-0.4 \pm 4.0\text{kg}$, $p = 0.78$; $n=10$). At baseline, dietary intake was low in both groups ($5.4 \pm 1.5\text{MJ}$ for the control group and $6.1 \pm 1.4\text{MJ}$ for the experimental group) and below the minimum requirement for Dutch nursing home residents (6.8 MJ/day) (Mathey et al. 2001). At the end of the intervention period, no differences were reported in energy and macronutrient intake but the experimental group showed significant increases in vitamin C and E. Quality of life remained stable for experimental group participants but declined among control group participants. Compared to the previous study, study strengths included a lengthy intervention period (1-year), use of a control group, and use of weight scales, dietitians and weigh back methods to assess for changes in body weight and dietary intake. A limitation of both studies was the small sample sizes of 12 participants or less.

A subsequent study investigated the effect of family-style meal service on energy intake and risk of malnutrition among Dutch nursing home residents. Compared to Elmstahl et al. (1987) and Mathey et al. (2001), this study utilized a randomized controlled trial design and recruited a larger sample (n=178). Participants were randomized into either a family-style meal service (n=94) or a pre-plated service (n=84) and served meals using that style of service for a time-period of 6 months. Researchers assessed changes in energy and macronutrient intakes and for improvements in quality of life and physical performance. Additionally, anthropometric measurements were taken and a mini nutritional assessment tool was used to identify risk of malnutrition.

Study findings included increased energy intake (483 KJ; 95% [CI], 88-878) among participants randomized to the family-style meal service and decreased energy intakes for participants of the pre-plated service (420 KJ; 95% [CI], -713 to -127). Furthermore, family-style meal participants had increased intakes of carbohydrate (12.9 g; 95% [CI], 0.28-27.1), protein (4g; 95% [CI], 1.4-6.6), and fat (4.5g; 95% [CI], 0.8-8.4), while pre-plated participants showed decreased intakes of carbohydrate (-14.9g; 95% [CI], -23.4 to -6.4), and protein (-3.7g, 95% [CI], -6.3 to -1.1). Decreased intakes of fat were also reported among pre-plated participants; however, results were not statistically significant (-3.1; 95% [CI] -7.9 to 1.6). At the end of the 6 months, family-style meal participants classified as malnourished according to the mini nutritional assessment decreased from 17% to 4%, whereas the percentage increased from 11%-23% for pre-plated service participants (Nijs et al. 2006).

Aside from increasing nutritional intake, the use of a family-style meal service fosters independence for elderly residents, particularly those with dementia. A study by Altus et al. (2002) aimed to examine the effect of changing styles of meal delivery from a pre-plated to a family-style meal service on communication and participation during mealtimes. Authors hypothesized the following: 1) the use of family-style meals would result in an increase in independent resident behavior; and 2) the serving and passing of food during family-style meals would result in an increase in appropriate resident communication. The secondary hypothesis was based on the previous work of VanBiervliet et al. (1987), which showed that the use of a family-style meal service increased communication for individuals with developmental disabilities.

A convenience sample was recruited (n=6) from an assisted living facility located in a Midwestern town. Participants were observed during lunchtime, 3 days per week (mean time 87 minutes) for changes in participation and communication. To assess for changes in participation, two observers used a checklist consisting of four categories: preparation tasks, serving and passing food, taking seconds, and cleanup tasks. Using an interval recording procedure while observing mealtimes, communication was scored as either appropriate (intelligible vocalizations, contextually suitable and non-aggressive) or inappropriate (unintelligible vocalizations, out of context, aggressive, or abnormally repetitive) (Altus et al. 2002). The study reported mealtime participation to be higher (24%) among participants served meals using the family-style meal service versus the pre-plated service (10%) (Altus et al. 2002). Interestingly, mealtime participation of 24% dropped to 6% with the reintroduction of the pre-plated service. The interval percentages

during which residents engaged in appropriate communication showed a similar trend, whereby appropriate communication increased (10.6%) with the use of a family-style meal service and declined (3.6%) with the reintroduction of the pre-plated service (Altus et al. 2002).

The positive association between increased mealtime participation for elderly nursing home residents during the use of a family-style meal service has been documented in one explanatory study. Barnes et al. (2012) using observational techniques aimed to capture and describe the mealtime experiences of nursing home residents (with or without dementia) by observing the lunch meals in four residential care homes. A total of seven dining settings were observed among the four residential homes. Meals were organized and served differently to residents among the settings, whereby three settings utilized a pre-plated meal service (setting 1, 2, & 3) and the remainder a family-style meal service (settings 3, 4, 5, & 6). Differences in mealtime experiences including task versus resident-centered mealtimes, resident independence, and levels of interaction in 68 participants (female n=45; male n=23) was documented by the use of a modified dementia care-mapping (DCM) tool. Regarding task versus resident centered mealtimes, results indicated that the family-style meal service fostered resident choice during mealtimes, primarily by offering food at the center of the table and thus, allowing residents to serve themselves. The family-style meal service also increased mealtime independence and interaction. Researchers reported that family-style dining setting residents communicated much more, formed good relationships, and supported each other during mealtimes. Researchers commented that the family-style meal service created a

community feel in the home, making mealtime more of a social occasion (Barnes et al. 2012). In contrast, there was little or no communication observed among residents of the pre-plated dining settings and researchers commented that many residents appeared more withdrawn and disengaged during mealtimes (Barnes et al. 2012).

Family-Style Meal Service & The School Foodservice Environment

To our knowledge, two research studies have investigated a family-style meal service in the school foodservice environment (Cain, 1984; Donnelly et al. 2000). Overall, both studies investigated the effect of a family-style meal service on the dietary behaviors of children and plate waste. Specifically, the study by Cain (1984) investigated the effect of a family-style versus a cafeteria-style meal service on student's food preference, intake, and waste (Cain, 1984). Students in grades 4th – 6th (n=40) were randomly assigned to either a family-style or cafeteria-style meal service and were served two different menus. To assess student's food preferences, the two menus were constructed to include both popular and less popular food items. Menu 1 consisted of macaroni/ground beef and tomato, green beans, coleslaw, cinnamon roll, mixed fruit cup, and milk. Menu 2 included glazed ham, broccoli, carrot sticks, dinner roll, cherry crisp, and milk. A third menu consisting of a sausage patty, spaghetti with sauce, tossed salad, peach slices, dinner roll, and milk was incorporated into the study but only served to the cafeteria style- meal service on one occasion. During the study, Menu 1 and 2 were served during the same week, with menu 2 being served 1-3 days after menu 1. Each menu was served on two study days for a total of four days. Food evaluation forms and

24-hour recalls were used to assess food preference and changes in dietary intake during lunch, snack time, and dinner.

Significant differences in nutrient and energy intakes were reported among those students randomized to the family-style method of service. For example, children served menu 1 using the family-style method of service had increased intakes of key nutrients including protein, thiamin, riboflavin, niacin, and iron ($p < 0.05$). Similarly, when served menu 2, children randomized to the family-style method of service showed increases in energy intake and consumption of vitamin A during the lunch meal compared to children in the cafeteria-style of service (Cain, 1984). Significant differences in energy intake (46 and 35 percent of the RDA, respectively) were reported in children randomized to the family-style meal service for the dinner meal (Cain, 1984). However, no significant differences were reported between children's energy intake and method of service at snack time.

The study conducted by Donnelly et al. (2000) investigated the effect of family-style versus the traditional method of service on student's dietary intake and food waste. Similar to the previous study, students in grades 3rd through 6th were randomized to either a family-style ($n = 130$) or traditional style meal service ($n = 126$). Students were served the same menus and all menus were modified to comply with the USDA guidelines. Students randomized to the traditional-style method of service were served first and second without choice regarding food items and quantity, while students of the family-style meal service had to select each item on the table and seconds were allowed with choice. Research staff randomly observed students five times over an eight-week period.

To assess for changes in plate waste, observational techniques were implemented including visual estimation of portions remaining and completion of a pre-coded data sheet, which estimated portion size. A Registered Dietitian using the Food Processor Plus Version 5.00 menu analysis computer program (1992.ESHA Research, Salem, ORE.) analyzed plate waste content to assess for changes in energy and macronutrient intakes. Although not statistically significant, the study reported that there were increased intakes of energy, protein, and fat and less plate waste among students of the family-style meal service (Donnelly et al. 2000).

Presently, the studies conducted by Cain (1984) and Donnelly et al. (2000) appear to be the only studies to assess a family-style meal service in a school foodservice setting. Overall, there are strengths and limitations to each of these studies that should be addressed and considered during the interpretation of results. Limitations to the study conducted by Cain (1984) include a small sample size and a study duration that was short (e.g. 4 days). Cain (1984) reported a statistically significant difference between student's nutrient intake at dinner when served meals using the family-style versus the cafeteria style method of service; however, the statistical power of this association was limited by the study's small sample size (n=40). Compared to Cain (1984), the sample size of Donnelly et al. (2000) was relatively large (n=130 for family-style and n=126 for traditional-style). This was an inherent strength of the study. However, similar to Cain (1984), the study duration was short, lasting approximately eight weeks. The short duration of the study could be a possible reason as to why the study did not report findings that were of statistical significance. Furthermore, Donnelly et al. (2000) used

observational techniques to assess for changes in plate waste, which could have resulted in greater measurement error. Final strengths to both studies included implementation of randomized study designs to randomize students to either the family-style, cafeteria-style, or traditional-style methods of service.

Research Study Objectives

Given the limited state of the current literature on the use of a family-style meal service in a school foodservice setting, the present study was conducted in two phases and used a mixed methodology approach consisting of qualitative (phase I) and quantitative (phase II) research designs. During phase I of the research project, focus groups and individual interviews were conducted with parents, teachers, and children to identify the promoter's barriers, and perceptions to a family-style meal service in a school foodservice setting. During phase II, a survey instrument was developed to assess knowledge, attitudes, level of exposure, and interest/motivation of foodservice directors and school personal towards the use of a family-style meal service in a school foodservice setting.

Chapter II, Phase I

Phase I: Promoters, Barriers, and Perceptions to a Family-Style Meal Service in a School Foodservice Setting

I. Overview

Schools are recognized as suitable environments to promote, improve, and enhance children's health. Research suggests a positive correlation exists between children's health and the prevalence of family-style meals. The purpose of this study was to identify the promoters, barriers, and perceptions of a family-style meal service in a school foodservice setting. Five focus group interviews (n=40), with children (kindergarten, 3rd and 4th grade), parents, and teachers were conducted at an independent suburban school within the Minneapolis metropolitan area. Individual interviews (n=8) were conducted over the phone with foodservice directors and school administrators from Philadelphia and Minnesota. Focus groups and individual interviews were transcribed verbatim and coded by three individual coders to generate themes. Promoters of family-style meals included life-skill development for children such as social skills and mealtime etiquette. Food preference development and healthy eating behaviors were positively associated with a family-style meal service through adult role-modeling, peer to peer interaction, community building within the school environment, and increased exposure to diverse foods. Barriers to family-style meals included cost, lack of resources, inadequate staffing, and ensuring compliance with federal school meal regulations. This study suggests that family-style meals in school settings are developmentally appropriate, increase children's acceptance of healthy foods.

Chapter II, Phase I: Focus Groups

II. Methods

A. Study Design:

Qualitative research methods in the form of focus groups and individual interviews. The purpose of the focus groups and individual interviews was to identify perceptions, barriers, and promoters of serving family-style meals in a school foodservice setting. Questions were developed and themes generated based on the Social Ecological Model (Sallis et al. 2008; Gregson et al., 2001; Story et al. 2008).

B. Participants:

Five focus groups were conducted with children (K, 3rd, & 4th), parents, and teachers from an independent school within a suburb of the Minneapolis Metropolitan area. A convenience sample was selected by school administration. The majority of parents (86%) and teachers (92%) were female. Employment status varied between teachers and parents. Over half of parents reported employment status of homemaker (56%) with the remainder indicating either employed for wages (29%) or self-employed (14%). In relation to education level, a majority of parents (71%) had a baccalaureate degree while a majority of teachers (67%) had Master's degrees. Marital status was equally distributed among all participants. The average age among parents and teachers was 42 and 52 years, respectively (Table 2-1). Child demographic characteristics were not collected.

C. Focus Group Procedures and Data Collection:

Five focus groups were conducted between May and June 2013. The principal-investigator contacted the school principal to obtain permission for the school to participate in the focus group discussions. The school principal signed a letter of approval (Appendix A) that granted researcher's permission to conduct the focus group discussions. Child consent forms (Appendix B) were sent home requesting permission from parents for their child to participate in the child focus group discussions. Child assent was obtained prior to beginning the focus group discussions (Appendix C). Parents and teachers participating in the focus group discussions were asked to sign a consent form (Appendix D & E) and complete a demographic survey (Appendix F). Prior to the start of the focus group discussions parents and teachers completed the demographic survey. The University of Minnesota and St. Catherine University Institutional Review Boards approved the use of human subjects in this research prior to data collection.

The focus group questions varied depending on whether the focus group participants were parents, teachers, or children (kindergarten, 3rd and 4th grade) (Appendix G, H, I). All questions were open-ended and explored the perceptions, barriers, and promoters to a family-style meal service in a school foodservice setting. Focus group questions with teachers (Appendix H) and parents (Appendix I) focused on the following: 1) benefits and barriers to use of a family-style meal service in a school lunch environment; 2) feasibility to use of a family-style meal service in a school lunch

environment; 3) benefits and barriers as compared to other foodservice delivery methods used in a school lunch environment; and 4) promoters to use of a family-style meal service in a school foodservice setting.

Focus group questions for 3rd and 4th grade children (Appendix G) addressed the following: 1) reflection on past experiences, likes, and dislikes of being served school lunch using the family-style meal service; 2) present roles and responsibilities of serving school lunch to younger children using the family-style meal service in a school lunch environment; and 3) assessment of eating behaviors and food preferences from exposure to a family-style meal service. The focus of Kindergartener focus group questions included: 1) likes and dislikes of having school lunch served through a family-style meal service; 2) likes and dislikes of having biddy helpers involved in serving school lunch through the family-style meal service; and 3) assessment of eating behaviors and food preferences from exposure to a family-style meal service. The school received compensation in the form of a \$20 Target gift card for each parent, teacher, and child participant. A nutrition graduate student moderated the focus groups. The student read about focus group methodology (Krueger & Casey, 2000) and received training from her advisor prior to moderating the focus groups. The student's advisor provided feedback after the initial focus group to allow for better adherence to the standards by the student.

D. Data Analysis:

Focus groups were audiotaped and transcribed verbatim. Three investigators hand-coded all transcripts using analysis strategies according to Krueger (Krueger, 2009).

Analysis occurred in four stages: 1) the first stage consisted of “coding”, whereby sentences within the focus group data were assigned codes; 2) codes were then discussed by the investigators and divided into three categories including the barriers, promoters, perceptions and implementation (i.e. next-steps) to use of a family-style meal service in a school foodservice setting; 3) categories were then divided into themes; and 4) themes were organized into the different levels within the Social Ecological Model (Sallis et al. 2008; Gregson et al. 2001; Story et al. 2008). The investigators met on a weekly basis to discuss codes, categorize the codes into groups, and finalize overall themes.

Chapter II, Phase I: Individual Interviews

A. Participants:

Eight semi-structured individual interviews were conducted with school foodservice directors (n=4) and school administrators (n=4). Due to limitations surrounding the number of schools that use a family-style meal service, the co-investigator had to generate a convenience sample. Participants were identified by an Internet search and the use of specific key phrases such as, “schools that serve family-style meal service,” “family-style meals in school foodservice setting,” and “school lunch and family-style meals.” The majority of the participants were male (75%). All participants indicated that they were employed for wages by: 1) for-profit company or business or of an individual, for wages, salary, or commissions (25%); or 2) not-for-profit, tax-exempt, or charitable organization (75%). Participant education level included some college (25%), a Master’s degree (50%), or a Doctoral or other professional degree (25%) and marital status was equally distributed amongst all participants (Table 2-2).

B. Individual Interview Procedures and Data Collection:

Eight individual interviews were conducted between May and June 2013. Geographical location of interview subjects included Pennsylvania (n=5) and Minnesota (n=3). A nutrition graduate student contacted prospective participants by telephone to determine their willingness to participate in the study. Informed consent was obtained over the phone prior to beginning the interview (Appendix J). A nutrition graduate student conducted the individual interviews. Prior to conducting the individual interviews the student’s primary advisor provided training. In addition, the student read extensively

about individual interview methodology (Krueger & Casey, 2000). Interview length ranged from 30 to 60 minutes. Compensation was in the form of a \$20 Target gift card, which was mailed to each participant after completion of the interview. Interview questions were similar to those used with the focus group discussions. Demographic characteristics were collected through an online survey (Appendix F) administered by Qualtrics, a free survey tool available through the University of Minnesota. The University of Minnesota and St. Catherine University Institutional Review Boards approved the use of human subjects in this research prior to data collection.

Interview questions focused on the following topics: 1) individual and school demographics; 2) benefits and barriers to use of other foodservice delivery methods besides the family-style meal service in a school foodservice setting; 3) benefits and barriers to use of a family-style meal service in a school foodservice setting; 4) benefits and barriers to incorporation of a family-style meal service in a school foodservice setting that uses a different foodservice delivery method; 5) feedback from parents, administrators, janitors, or children regarding perceptions towards the use of the family-style meal service in their school foodservice setting; and 6) resources necessary to transition to a family-style meal service in a school foodservice setting (Appendix K).

C. Data Analysis:

Individual interviews were audiotaped and transcribed verbatim. Similar to the focus groups, transcripts were hand-coded by three investigators using analysis strategies according to Krueger (Krueger & Casey, 2000). Analysis occurred in four stages: 1) the

first stage consisted of “coding”, whereby sentences within the individual interview data were assigned codes; 2) codes were then discussed by the investigators and divided into three categories including the barriers, promoters, perceptions and implementation (i.e. next-steps) to use of a family-style meal service in a school foodservice setting; 3) categories were then divided into themes; and 4) themes were separated into corresponding levels within the Social Ecological Model (Sallis et al. 2001; Gregson et al. 2001; Story et al. 2008). The investigators met on a weekly basis to discuss codes, categorize the codes into groups, and finalize the overall themes.

III. Results:

A. Phase One: Focus Groups and Individual Interviews

The focus groups (n=20) and individual interviews (n=8) resulted in a total of twenty-eight adult participants. Table 1 and Table 2 show the characteristics of the adult focus group and individual interview participants. Transcripts were analyzed and coded to generate themes to identify the promoters, barriers, and perceptions to the use of a family-style meal service in a school food service setting. After the themes were developed, researchers used the Social Ecological Model (Sallis et al. 2001; Gregson et al. 2001; Story et al. 2008) to categorize the themes. More specifically, the themes were organized into the four levels of the Social Ecological Model including the individual, social environment, physical environment, and macro-level environment. The themes will be presented using the theoretical framework and described in narrative form. Tables 2-3,

2-4, 2-5, and 2-6 illustrate the themes and representative quotes that emerged at the individual, social, physical, and macro-level environments.

Individual Level

Life-skill development

Many adult participants expressed that the use of a family-style meal service in a school food service setting promoted life-skill development in children. More specifically, participants commented that through the family-style meal service children learned proper mealtime etiquette, important values including responsibility and leadership, and developed social and motor skills. Participants commented that children developed social skills during the family-style meal service because the method of service provided increased opportunity for conversation during mealtimes between the child, other peers, and the adult at the table. For example one participant commented, “The cafeterias become classroom. Where students learn social behavior with adults and other students.” Another comment was, “It brings up an opportunity to socialize sometimes with people we wouldn't normally socialize with. It gives us an opportunity to have conversations that are a little more substantive... conversation with an adult at the table.”

Numerous participants discussed how the family-style meal service instilled values of leadership and responsibility in children. Participants primarily agreed that the method of service promoted the development of these values because children are required to play an active role during mealtimes. Participants explained that children

serve as helpers during the family-style meal service by setting the tables, serving the food, and assisting in cleanup. A few participants also felt that the family-style meal service taught children about proper mealtime etiquette. One participant stated, “My kids, they know how to wash their hands, they know how to use their utensils, they know how to clean the table so it’s nice and sanitary.”

Many participants agreed that compared to other methods of service, the family-style meal service not only taught mealtime etiquette but also enhanced the development of children’s manners. For example, one participant said, “My kids come through the public traditional service. They’re not being taught to adjust their table manners; you know their ‘please’ and ‘thank you,’ they don’t have any supervision at the table...so it has a huge impact on the kids and just the education and etiquette and manners and all of that.”

Food preference development

Many participants discussed how the family-style meal service promoted the food preference development in children. Specifically, participants expressed how the method of service increased children’s exposure to different foods that they may not normally eat or have access too. For example, one participant explained how the socioeconomic status of children attending the school was the third poorest in the state and many children lived in homes with limited access to major grocery chains. The participant then commented, “To have a 5-6 year old say broccoli or polenta, you know they’re not seeing polenta in the corner store. Their exposure came from the family-style program.”

Participants reported that food preference development was also enhanced with the use of a family-style meal service because children were more willing to try new foods. For example one participant said, “Our younger kids are more adventurous in their willingness to try things than the older kids.” A majority of participants expressed that children’s willingness to try new foods was enhanced through continuous exposure to different foods and also by the presence and influence of adults during mealtimes. Typical comments included, “They look at their plate and its not palatable to them. But you encourage them... they take that risk and they try the food, and they learn to eat and love... its great to be able to give them that opportunity to try different foods.”

Lastly, participants expressed that children’s food preference development was promoted with use of the family-style meal service due to the limited amount of choices offered during mealtimes. For example, a participant stated, “In our environment. We have hundreds of choices. If you serve family-style the choices diminish greatly. You basically serving...an entree, a couple side, maybe a salad, and possible a dessert at the end.”

Social Environmental Level

Adult presence at mealtime

The presence and influence of the adult during mealtimes emerged as a promoter to the use of a family-style service at the social environmental level of the Social Ecological Model. Many participants commented that adults served as organizers and facilitators during mealtimes. Furthermore, a majority of participants felt that the adult served as a role model to children by trying new foods with the children and having

conversations with children about food and healthy eating practices. Comments included, “You can do a group tasting, okay, we are all going to try the peas now, one, two, three, and that works, you know.” One participant stated that children were less likely to feel left out during mealtime with the presence of an adult. The comment included, “With an adult at the table, you don’t have kids who are being isolated; you don't have kids that are being left out.” Lastly, participants viewed mealtimes as a second teaching time for children with the presence of an adult at the table. Importantly, this teaching time was viewed as more holistic rather than academic. For example, one participant commented, “There’s a teaching going on about the manners, about health, about life and how we relate to one another.”

Community development within the school environment

Participants discussed how increased socialization and mixing of grade-levels during mealtimes with the use of a family-style meal service promotes community development within the school environment. Typical comments included, “But to me, it also adds a socialization dimension umm, you got multiple dimensions of people connecting, and mealtime isn’t just a time where you shove it down and move on to your next activity” and “It’s, you take time to spend a little bit on your relationships and you’re trying to nourish your physical body” and “I think a community, family-style service, kids absorb some of the ability for being served and cleaning up and they have to work together and partnership, and then there’s some socialization and there’s enough time to do that.”

Development of connection between home and school environments

Some participants said that the family-style meal service promotes connections between the home and school environments. Participants discussed how parents are invited occasionally to volunteer during mealtimes and eat with their children. One participant commented when making the transition over to the family-style meal service, the school set up a “parent night,” where they invited all parents to come eat dinner with their children using this method of service. The goal was to provide parents with the opportunity to observe and thus, better understand how this method of service could be beneficial for children. Participant comments included, “We use ‘thank-you bites’ and have consistency of terminology between school and home” and “They teach each other and even go home to teach their parents.”

Physical Environmental Level

Availability and accessibility of healthy foods

A major promoter identified by participants regarding the use of a family-style meal service in a school foodservice setting was the ability of this service to increase the availability and accessibility of healthy foods to children. Many participants discussed how this method of service focuses on serving fresh, less-processed foods. Typical comments included “We use a lot of local produce through our produce company, use local meat, cheeses, and organics when we can” and “I can tell you that most of what we serve now is fresh. What we served before was frozen or canned.” Participants also

discussed how a majority of the food served is prepared by a chef and from scratch. To illustrate this concept of scratch cooking, one participant said, “Everything from scratch even dressings.” Furthermore, participants felt that the increased availability and accessibility of these healthy foods during mealtimes contributed to the development of healthy eating behaviors and practices in children. More specifically, many participants commented on how the family-style meal service offers fruit as dessert during mealtimes and its contribution to the development of healthy eating habits in children. Participant comments included, “We only have dessert once a week; and it really promotes the choices of good fruit and just developing those good habits” and “They look forward to their dessert but in the meantime, they look forward to the fruit just as much. So that is...I think that has a real benefit to healthy eating.” Lastly, participants felt that children had greater access to healthy foods through the use of a family-style meal service versus other methods of service because all food components are placed on the table, which provides children with an opportunity to be exposed to different foods, serve themselves during mealtimes, and try new foods they otherwise would not be willing to try.

Family meal dining experience

Participants perceived the family-style meal service as an opportunity to provide all children with a family meal dining experience. Participants viewed this as highly important due to the low socioeconomic status of children attending their schools and the change in family dynamics over the last 50 years. One participant commented, “A lot of kids do not sit down like this at home or never have. It is beneficial.” Another participant

equated the experience of the family-style meal service to Norman Rockwell's infamous "Thanksgiving Dinner" painting. The specific comment was, "But I would say for me it's like the Norman Rockwell painting of the family dinner...its folks just seated talking, smiling, enjoying each other's company."

Relaxed mealtime ambience and experience

The use of the family-style meal service in a school foodservice setting was perceived as more calm compared to other methods of service. Overall, participants believed that these characteristics resulted in a mealtime ambience and environment that was more relaxed. One participant commented, "The kids feel respected. They are encouraged to talk to each other. The round tables instead of the long ones feel more homey, feel more inviting, and feels less institutional."

Logistics

Many participants expressed that a barrier to the use of a family-style meal service in a school foodservice setting would be logistics. Specifically, participants discussed logistical concerns related to preparation time and cost. Because the food served is fresh and made from scratch participant comments included, "It is a lot of work. It takes preparation, a lot more work than the traditional style. You are preparing meals for tomorrow today" and "When you go from already cooked to fresh cut and prepared, that takes time" and "We have 500 kids and prep is intense. If we have overtime, it is what we have to do to make things work." The use of fresh foods was also perceived as

increasing the cost of meals served. Many participants discussed how serving meals using a family-style meal service would only be possible if schools had flexible contracts with food vendors and could shop around for the best food.

Macro Environmental Level

Meeting National School Lunch Program Guidelines

Meeting the NSLP guidelines was a perceived barrier to the use of a family-style meal service in a school foodservice setting. However, many participants discussed how the NSLP guidelines could be met when choosing to implement the family-style meal service. Participants expressed that in order to meet the NSLP guidelines, kitchen staff had to be properly trained on the protocol and procedures. The procedure described by participants included portioning out the food in accordance with the NSLP guidelines prior to serving. For example, participant comments included, “We portion it and then serve once it gets to the table” and “ all menus are written with the NSLP guidelines and the informational guidance that we got from the state is that the serving sizes is on the kitchen, so for example, if everyone’s supposed to have a cup of rice, and you know there’s going to be eight kids at the table, then it’s the responsibility of the kitchen to put eight cups on the table and once that is done, then you can count that as being served to the children.”

Table 2-1. Characteristics of Adult Focus Group Participants		
Characteristics	Teachers (n = 12)	Parents (n = 8)²
Age (y) ¹	52 (10)	42 (4)
	n (%)	n (%)
Gender		
Male	1(8)	1(14)
Female	11(92)	6(86)
Marital Status		
Single (never married)	0	0
Married	9(75)	7(100)
Divorced	2(17)	0
Widowed	1(8)	0
Race/Ethnicity		
Caucasian	12(100)	6(85)
African American	0	1(15)
Education Level		
High School Graduate	0	0
Associate Degree	1(8)	0
Baccalaureate degree	3(25)	5(71)
Master's degree	8(67)	1(14)
Doctoral or professional degree	0	1(14)
Employment Status		
Employed for wages	12(100)	2(29)
Self-employed	0	1(14)
Homemaker	0	4(56)

¹ Values represent means (SD) for age category.

² Missing information from one parent who declined to answer the questions.

Table 2-2. Characteristics of Individual Interview Participants	
Characteristics	Individual Interviews (n = 4)²
Age (y) ¹	37 (0.50)
	n (%)
Gender	
Male	1(25)
Female	3(75)
Marital Status	
Single (never married)	1(25)
Married	3(75)
Divorced	0
Widowed	0
Race/Ethnicity	
Caucasian	1(25)
African American	3(75)
Education Level	
Some college	1(25)
Associate degree	0
Baccalaureate degree	0
Master's degree	2(50)
Doctoral or professional degree	1
Employment Status	
Employed for wages	4(100)
Self-employed	0
Homemaker	0

¹ Values represent means (SD) for age category.

² Missing information from four participants who declined to answer the questions.

Table 2-3. Individual Level Emerging Themes and Representative Quotes: Adult Focus Group and Individual Interview Participants

Social Ecological Level	Theme	Representative Quotes
<p style="text-align: center;">Individual Level</p>	<p>Life-Skill Development</p>	<p>“My kids, they know how to wash their hands, they know how to use their utensils, they know how to clean the table so it’s nice and sanitary.”</p> <p>“It brings up an opportunity to socialize sometimes with people we wouldn't normally socialize with. It gives us an opportunity to have conversations that are a little more substantive conversation with an adult at the table.”</p> <p>“The cafeterias become classroom. Where students learn social behavior with adults and other students.”</p> <p>“My kids come through the public traditional service. They’re not being taught to adjust their table manners; you know their ‘please’ and ‘thank you’. They don’t have any supervision at the table...so it has a huge impact on the kids and education and etiquette and manners and all of that.”</p>
	<p>Food Preference Development</p>	<p>“They look at their plate and its not palatable to them. But you encourage them... they take that risk and they try the food, and they learn to eat and love... its great to be able to give them that opportunity to try different foods.”</p> <p>“To have a 5-6 year old say broccoli or polenta, you know they’re not seeing polenta in the corner store. Their exposure came from the family-style program.”</p> <p>“In our environment. We have hundreds of choices. If you serve family-style the choices diminish greatly. You basically serving...an entree, a couple side, maybe a salad, and possible a dessert at the end.”</p>

Table 2-4. Social Environmental Level Emerging Themes and Representative Quotes: Adult Focus Group and Individual Interview Participants		
Social Ecological Level	Theme	Example Quote
Social Environmental Level	Adult Presence At Mealtime	<p>“You can do a group tasting, Okay, we are all going to try the peas now, one, two, three, and that works, you know.”</p> <p>“There’s a teaching going on about the manners, about health, about life and how we relate to one another.”</p> <p>“With an adult at the table, you don’t have kids who are being isolated; you don’t have kids that are being left out”</p>
	Community Development Within the School Environment	<p>“But to me, it also adds a socialization dimension umm, you got multiple dimensions of people connecting, and mealtime isn’t just a time where you shove it down and move on to your next activity.”</p> <p>“It’s, you take time to spend a little bit on your relationships and you’re trying to nourish your physical body.”</p> <p>“I think a community, family-style service, kids absorb some of the ability for being served and cleaning up and they have to work together and partnership, and then there’s some socialization and there’s enough time to do that.”</p>
	Development of Connection Between the School and Home Environments	<p>“We use ‘thank-you bite’ and have consistency of terminology between school and home.”</p> <p>“They teach each other and even go home to teach their parents.”</p>

Table 2-5. Physical Environmental Level Emerging Themes and Representative Quotes: Adult Focus Group and Individual Interview Participants		
Social Ecological Level	Theme	Representative Quote
Physical Environmental Level	Availability and Accessibility of Healthy Foods	<p>“We use a lot of local produce through our produce company.”</p> <p>“I can tell you that most of what we serve now is fresh. What we served before was frozen or canned.”</p> <p>“We only have dessert once a week; and it really promotes the choices of good fruit and just developing those good habits.”</p> <p>“They look forward to their dessert but in the meantime, they look forward to the fruit just as much. So that is... I think that has a real benefit to healthy eating.”</p>
	Family Meal Dining Experience	<p>“But I would say for me it’s like the Norman Rockwell painting of the family dinner... its folks just seated talking, smiling, enjoying each other’s company.”</p> <p>“A lot of kids do not sit down like this at home or never have. It is beneficial.”</p>
	Relaxed Mealtime Ambience and Environment	<p>“The kids feel respected. They are encouraged to talk to each other. The round tables instead of the long one feel more homey, feel more inviting, and feels less institutional.”</p>
	Logistics	<p>“I would say about 30 percent more, now that we have gotten better about shopping around that has gone down, but I would say initially 30 percent more.” (Reference to costs)</p> <p>“It is a lot of work. It takes preparation, a lot more work than the traditional style. You are preparing meals for tomorrow today.”</p>

Table 2-6. Macro Environmental Level Emerging Themes and Representative Quotes: Adult Focus Group and Individual Interview Participants		
Social Ecological Level	Theme	Representative Quotes
Macro Environmental Level	Meeting National School Lunch Program Guidelines	<p>“We portion it and then serve once it gets to the table” and “all menus are written with the NSLP guidelines and the informational guidance that we got from the state is that the serving sizes is on the kitchen, so for example, if everyone’s supposed to have a cup of rice, and you know there’s going to be eight kids at the table, then it’s the responsibility of the kitchen to put eight cups on the table and once that is done, then you can count that as being served to the children.”</p> <p>“We portion it and then they serve once it gets to table.”</p>

Chapter III, Phase II

Phase II: Survey of Foodservice Directors and School Administrators

Chapter III, Phase II: Survey of Foodservice Directors and School Administrators

I. Methods

A. Study Design:

Quantitative research methods utilizing a cross-sectional survey design. Qualtrics, an online survey tool available through the University of Minnesota was used to administer the survey nationwide to a random sample of Foodservice Directors and School Administrators to assess knowledge, attitudes, level of exposure, and interest/motivation to a family-style meal service in a school foodservice setting. The University of Minnesota and St. Catherine University Institutional Review Boards approved the use of human subjects in this research prior to data collection.

B. Survey Development:

Themes from initial focus groups and individual interviews were used to inform survey development. The purpose of the survey was to assess foodservice directors and school administrator's knowledge, attitudes, exposure, and interest/motivation of a family-style meal service in a school foodservice setting. The research team met weekly to develop survey questions and after several revisions, the final survey consisted of 25 questions (Appendix L).

To test the stability and reliability of the survey, a test-retest pilot was conducted. The test-retest method measures the reliability of a survey instrument by administering the same survey with the same participants on two different occasions and has been used in previous quantitative studies (Lee, Kwon, & Sauer, 2013; Burgess-Champoux, Rosen,

Marquart, & Reicks, 2008) Test-retest participants were identified from the Minnesota Department of Education database (<http://education.state.mn.us/MDE/Welcome/SchOrg/>) and were selected if they had a title of “Foodservice Director or Manager.” An excel spreadsheet was created with the names of all eligible participants. A total of 20 participants (female=90%, male=10%) were selected at random from the list to form the test-retest study sample.

On October 7th, 2013 the test survey was administered to participants. Participants were given a week to complete the survey. Two weeks later on October 21st, 2013 the re-test survey was administered. Compensation was given in the form of a \$15 Target gift-card. To assess the stability reliability between time 1 and time 2 for each category within the survey, Spearman correlation coefficients were calculated. If correlations were below 0.45, the research team revised questions to enhance clarity and understanding. After revisions, the final survey consisted of 25 questions related to demographic characteristics and four categories including knowledge, attitudes, level of exposure, and interest/motivation. Demographic questions included occupation, registered dietitian status, geographic location, school district size, percentage of free and reduced price meals, and National School Lunch Program participation by grade level.

Description of Survey Items

Knowledge

The USDA definition of family-style meal service in a school lunch environment was provided for each participant (Food and Nutrition Services USDA, 2013-2014).

Following the definition, 3 questions assessed knowledge of a family-style meal service. Participants were asked to rate their level of agreement to the questions using a 5-point scale. The questions included: 1) How similar is the above definition to what you had in mind prior to the survey (1= not very similar and 5= very similar); 2) How well do you understand the USDA definition of a family-style meal service (1= not at all well and 5= very well); and 3) How confident do you feel in your ability to apply the family-style meal service based on the USDA definition (1= not very confident and 5= very confident) (Appendix L; Q8, Q9, Q10).

Level of Exposure

Four questions (Appendix L; Q11, Q12, Q13, Q14) assessed level of exposure to a family-style meal service in a school foodservice setting. Based on a yes/no response, the first question asked participants whether they had previous experience serving lunch to students using a family-style meal service. If participants answered yes, they were directed to the next question to assess level of exposure. In the form of a text-entry response, the next three questions included: 1) Briefly describe where you experienced the use of “family-style” meals; 2) Briefly describe the benefits to “family-style” meals in a school lunch environment; and 3) Briefly describe the barriers to “family-style” meals in a school lunch environment. If participants indicated that they had no previous experience using a family style meal service, they were directed to questions assessing attitudes.

Attitudes

Four questions (Appendix L; Q15, Q16, Q17, Q18) assessed attitudes related to the benefits (Appendix L; Q15, Q16, Q17) and barriers (Appendix L; Q18) of a family-style meal service in a school foodservice setting using a 5-point scale (1= strongly disagree and 5= strongly agree). The first question included: “Based on the USDA bulleted summary of “family-style meals,” the application of “family-style meals” in a school lunch environment could: 1) provide students the opportunity to socialize with adults during the lunch period; 2) expose students to a wide variety of foods; 3) meet government regulations by offering all food components; and 4) meet specific nutrient recommendations by offering all food components. To further assess benefits to a family-style meal service the following questions was asked: Based on the USDA bulleted summary of “family-style meals”, adult supervision during the application of “family-style meals” in a school lunch environment could: 1) provide an opportunity to build social skills by conversing with adults; 2) provide a role-model to encourage positive selection of food components; and 3) promote a holistic school environment. The last question to assess benefits included: Based on the USDA bulleted summary of “family-style meals,” mealtimes for children should encompass “learning” where students: 1) learn about how food is acquired, produced, and served at school; 2) learn about the health benefits of food served; and 3) apply the nutritional knowledge they learned in the classroom to make healthy choices during lunch.

Attitudes related to family-style meal barriers were assessed by the following question: Potential barriers when serving school lunch to students using “family-style

meals” could be a lack of: 1) resources; 2) adequate staffing; 3) preparation time; 4) assessing that federal requirements are met for reimbursable meals; 5) money; and 6) facility space.

Interest/motivation

Seven questions (Appendix L; Q19, Q20, Q21, Q22, Q23, Q24, Q25) assessed participant’s interest and motivation towards a family-style meal service in a school foodservice setting. Using a 5-point scale (1= not at all interested and 5= very interested), the first question included the following: “Regardless of the potential barriers, how interested are you in learning more about the concept of “family-style meals” in a school lunch environment?” The next two questions also used a 5-point scale (1= strongly disagree and 5=strongly agree). The first question stated: As a foodservice director/manager, my interest in learning more about the use of a “family-style meal” in a school lunch environment will be motivated by: 1) reduced production costs; 2) reduced plate waste; 3) increased number of reimbursable meals served; 3) meeting food safety requirements; and 4) reduced overall cost. The second question stated: As a foodservice director/manager, my interest in learning more about the use of a “family-style meal” in a school lunch environment will be motivated by increased: 1) student socialization with peers; 2) student socialization with adults; 3) student consumption of fruits and vegetables; 4) willingness of students to try new foods; 5) community engagement within the school environment; 6) availability of healthier, less-processed food to the students; and 7) connections between the home and school environments.

Using a check all items that applied method, the next question pertained to personal motivation to make the transition to a family-style meal service and included six items: 1) money; 2) resources; 3) increased consumption of fruits and vegetables; 4) increased time for students to socialize; 5) ability of students to socialize with adults; and 6) increased supervision of students by adults. The final questions included potential response options of yes/no, maybe, or not sure and addressed whether completing the survey made participants more: 1) interested in the concept of a family-style meal service in a school foodservice setting; and 2) whether completing the survey made participants more receptive to the application of a family-style meal service in a school foodservice setting.

C. Data Collection Procedures

Between October 7th, 2013 and December 1st, 2013 foodservice directors and managers for the nationwide survey were recruited. Participants were identified through a membership list provided by individual State School Nutrition Associations (State SNA). The specific protocol to obtain the lists involved researchers contacting each State SNA individually by phone, using a phone script (Appendix M) and requesting consent (Appendix M) to obtain a copy of the State SNA foodservice director and manager membership list. A total of 41 State SNA were contacted. Contact was not made with 9 State SNA due to the unavailability of contact information. Consent forms were received from six State SNA. Collectively, the six lists provided names and email addresses for a total of foodservice directors and managers. These 763 foodservice directors and

managers were selected as survey participants and contacted through email. The first email was sent to the 763 participants on December 18th, 2013. The content within the email included a letter that described the study and survey objectives and a link to access the survey (Appendix N). A consent form was provided at the beginning of the survey (Appendix L, Q1). Of the 763 initial emails sent, 45 post-mark emails were returned indicating the email addresses were either nonexistent or invalid. To maximize response rate, a second reminder email was sent to the remaining 718 participants on January 6th, 2014. Compensation was given in the form of two Apple iPad Mini. Participants who completed greater than 75% of the survey were entered into the drawing to win the Apple iPad Mini. The two participant winners were notified via email on March 9th, 2014.

D. Data Analysis

Data were analyzed using Statistical Analysis System (SAS, version 9.3, copyright 2002-2003, SAS Institute Inc, Cary, NC). The level of statistical significance was set at $p < 0.05$. Spearman correlation coefficients were calculated to determine test-retest correlations between the two time intervals. Descriptive statistics including means, standard deviations, and frequency distributions were generated. Exploratory factor analysis was conducted using Principal components analysis with Varimax rotation to identify factors related to knowledge, attitudes, and interest/motivation towards a family-style meal service in a school foodservice setting. Factors with an eigenvalue of one or more were retained based on Kaiser criterion (Kaiser, 1960) and the scree plot test (Cattell, 1966). Factor loadings were considered “high” if the absolute value exceeded

0.40 (Stevens, 1986). Internal consistencies for factor patterns were assessed through calculation of Cronbach alpha coefficients (Nunnally, 2004). Cronbach alpha > 0.7 were indicative of good to excellent internal consistency (Nunnally, 2004).

II. Results:

A total of 233 surveys were completed out of the 718 sent to foodservice directors and/or school administrators resulting in an overall response rate of 32%. Of the 233 completed surveys, 48 were removed from the data set due to survey completion that was $< 75\%$. Therefore, 187 surveys compromised the final analytical sample. The presentation of results consists of two parts: 1) descriptive statistics and 2) results of the exploratory factor analysis using Principal components analysis, and Cronbach alpha coefficient calculations performed on knowledge, attitude, and interest/motivation items.

Descriptive Results

Demographic Characteristics

Demographic characteristics of participants are presented in Table 3-1. The majority of the survey participants had a title of Foodservice Director (78%) followed by Foodservice Manager (13%), Foodservice Employee (2%), and other (7%). Titles listed as “other” included Foodservice Supervisor (district level), Nutrition Fund Coordinator, Head Cook, Consultant, Record Keeper, Foodservice Director Assistant, Registered Dietitian, Operations Manager, Camp Director, Food Service Director, Nutrition Coordinator

(district level), and District Level Coordinator. Approximately 81% of participants stated they were not Registered Dietitians.

Participants identified their geographic location as Midwest (54%), South (39%), and North East (7%). Student enrollment in districts ranged from less than 2500 to greater than 50,000 although 47% stated that enrollment was less than 2500. Percentage of students that received free or reduced price lunches ranged from 10-80% and the majority of participants (> 95%) indicated that all grades in their district including elementary school, middle school, and high school participated in the National School Lunch Program.

Knowledge

Three questions assessed knowledge of a family-style meal service. The three questions referred to the USDA definition of a family-style meal service and included: 1) How similar is the definition to your prior knowledge before completing the survey?; 2) How well do you understand the definition?; and 3) How confident are you in your ability to apply a family-style meal service based on the definition?

Approximately 40% of participants indicated that the USDA definition of a family-style meal service was somewhat similar to their knowledge prior to completing the survey. A little less than one-fourth (20%) of the survey participants indicated that the definition was “very similar” to their a priori knowledge. Thirty-seven percent stated that they understood the USDA definition “very well.” Of the total participants,

approximately 7% responded that they understood the USDA definition of a family-style meal service not very well at all or not very well.

Responses related to confidence were not evenly distributed. Sixteen percent indicated they were not at all confident in their ability to apply a family-style meal service based on the USDA definition. Approximately one-fourth indicated that they either were not confident (22%) or neither confident nor un-confident (20%).

Alternatively, 32% felt confident and 9% felt very confident in their ability to apply a family-style meal service based on the USDA definition provided. As shown in Table 3-2, means and standard deviation scores for knowledge items ranged from 1 to 5, with a mean of 3.62 ± 1.07 for similar, a mean of 3.99 ± 0.94 for understand, and a mean of 2.98 ± 1.26 for confident.

Level of Exposure

Four questions assessed level of exposure to a family-style meal service. Approximately one-fourth (26%) of survey participants indicated that they have had an opportunity to serve “family-style” meals in a school foodservice setting through a family-style meal service. A little less than three fourths (71%) indicated that they had not had the opportunity, while the remaining (3%) responded “unsure.” For those survey participants with previous exposure, a majority responded that the source of exposure came from past experience working at Head Start Programs.

Attitudes

Four questions that addressed benefits and barriers to a family-style meal service in a school foodservice setting were used to assess attitudes. For the first question, approximately half of survey participants agreed that the application of a family-style meal service could provide students an opportunity to socialize with adults during lunch (52%) and meet government regulations by offering all food components (50%). Only 3% of survey participants responded that they strongly disagreed with these items. A little less than half (45%) agreed that the application of a family-style meal service could enhance a student's willingness to try new foods, while 16% disagreed and 3% strongly disagreed. As shown in Table 3-3, means and standard deviation scores for attitude items related to this question ranged from 1 to 5. Mean values for question one ranged from 3.40 ± 0.96 (enhance a student's willingness to try new foods) to 3.58 ± 0.87 (meet government regulations by offering all food components).

For the second question, when asked about the benefit of having adult supervision during the use of a family-style meal service, over half of the survey participants agreed that the presence of a supervising adult would provide students with an opportunity to build social skills by conversing with adults (52%) and promote a holistic school environment (48%). A little over half also agreed that the presence of a supervising adult could provide students with a role model to encourage positive selection of food components (58%). As shown in Table 3-3, means and standard deviation scores for attitude items related to this question were scaled from 1 to 5. Mean scores were 3.55 ± 0.88 (provide students the opportunity to build social skills by conversing with adults),

3.70 ± 0.85 (provide students a role-model to encourage positive selection of food components), and 3.52 ± 0.85 (promote a holistic school environment).

The third question addressed attitudes towards the family-style meal service and its ability to encompass “learning” for students during lunchtime. Similar to the previous question, approximately half of participants agreed that the family-style meal service should encompass “learning” where students learn about how food is acquired, produced, and served at school (48%) and learn about the health benefits of foods served (52%). A little over half (60%) also agreed that students should learn how to apply the nutritional knowledge they learned in the classroom to make healthy choices during lunch. For each of the items in this question, 14% or less of total survey participants responded with strongly disagree or disagree. Similar to the previous two questions, means and standard deviation scores for attitude items related to this question ranged from 1 to 5. Overall, scores ranged from 3.68 ± 0.86 (learn about the health benefits of food served) to 3.78 ± 0.80 (apply the nutritional knowledge they learned in the classroom to make healthy choices during lunch) (Table 3-3).

The fourth attitude question addressed barriers to a family-style meal service in a school foodservice setting. Overall, participants responded that the two greatest barriers to a family-style meal service would be money (56%) and adequate staffing (42%). As shown in Table 3-3, mean and standard deviation scores for attitude items related to barriers ranged from 1 to 5. The highest means were observed among the following items: resources (4.11 ± 0.97), adequate staffing (4.52 ± 0.75), and money (4.07 ± 1.03).

Interest/Motivation

Two questions assessed participant's interest/motivation towards a family-style meal service in a school foodservice setting. When asked what would motivate participants to learn more about a family-style meal service, approximately half responded that their interest in learning more would be motivated by increased student consumption of fruits and vegetables (50%), student willingness to try new foods (51%), and community engagement within the school environment (49%). Furthermore, approximately 40% of participants also responded that their interest in learning more would be motivated by increased student socialization with peers (40%) and adults (42%). As shown in Table 3-4, means and standard deviation scores for interest/motivation items related to this question ranged from 1 to 5. Overall, mean scores ranged from 3.41 ± 0.93 (student socialization with peers) to 3.90 ± 0.91 (student consumption of fruits and vegetables).

The second question included the following: "My interest in learning more about the use of "family-style meals" in a school lunch environment will be motivated by." Participant responses showed that their interest in learning more about the family-style meal service would be motivated by a reduction in plate waste (58%), followed by reduced production costs (48%), reduced overall costs (43%), the ability of the family-style meal service to meet food safety requirements (43%), and the ability to increase the number of reimbursable meals (40%). Similar to the previous question, means and standard deviation scores for interest/motivation items related to this question ranged from 1 to 5. Items including reduced overall cost, meeting food safety requirements, and

increased number of meals reimbursed showed the highest means (3.79 ± 1.03 , 3.67 ± 1.09 , 3.82 ± 0.99) (Table 3-4).

Towards the end of the survey, participants were asked whether the survey had made them more interested in the concept of a family-style meal service and more receptive to the application of a family-style meal service. Roughly one-fourth (26%) responded “yes”, that the survey had made them more interested and receptive to the concept and application of a family-style meal service. However, 34% responded that the survey had not made them more interested and approximately 32% responded that the survey did not make them more receptive (Table 3-5). Lastly, regardless of the barriers, one fourth of participants were not at all interested in learning more about the application of a family-style meal service. In contrast, 34% responded that they were interested (Table 3-6).

Exploratory Factor Analysis and Reliability Analysis Results

Knowledge

Principal components analysis identified one component (or factor) regarding knowledge (Table 3-7). The factor labeled, “knowledge of a family-style meal service,” included two items (three originally) and explained 61% of the variance. The original three items included similar, understand, and confidence. Factor loadings for the three items varied from 0.83 to 0.66. However, the item confidence related to a participant’s knowledge of a family-style meal service was eliminated to increase the internal consistency from moderate ($\alpha=0.68$) to substantial ($\alpha= 0.73$).

Attitudes

Principal components analysis identified three components (or factors) regarding attitudes (Table 3-8 and Table 3-9). Factor one labeled, “attitudes towards family-style meal service benefits,” contained four items (five originally) and explained 33% of the variance. The four items included opportunity to socialize with adults, enhance a student’s willingness to try new foods, opportunity to build social skills by conversing with adults, and provide an adult role model. One item, promotes a holistic school environment, was discarded because it loaded onto more than one component (or factor). Factor loadings for the four items varied from 0.67 to 0.86. Factor two labeled, “attitudes towards family-style meal service benefits aside from nutrition,” contained four items and explained 17% of the variance. All items loaded at least 0.40 on factor two and no items were discarded. Factor loadings ranged from 0.56-0.81 with the highest loadings observed for the items, learn about the health benefits of food served (0.80) and apply the nutritional knowledge they learned in the classroom to make healthy choices during lunch (0.81). Lastly, factor three labeled, “attitudes towards family-style meal service barriers,” contained six items and explained 8% of the variance. Factor loadings ranged from 0.52 to 0.71 and no items were discarded. The highest factor loadings were observed among the items of money (0.70), facility space (0.71), and resources (0.71). Internal consistency was substantial for factor one ($\alpha= 0.91$), factor two ($\alpha= 0.82$), and factor three ($\alpha= 0.79$).

Interest/motivation

Principal components analysis identified two components (or factors) regarding interest/motivation (Table. 3-10). Factor one labeled, “interest/motivation towards a family-style meal service based on ability to reduce potential barriers,” contained five items and explained 52% of the variance. All items loaded at least 0.40 on factor one with a range from 0.70 to 0.87. Factor two labeled, “interest towards a family-style meal service based on ability to enhance children’s physical and social health,” contained two items (seven originally) and explained 15% of the variance. Five items (student consumption of fruits and vegetables, student willingness to try new foods, community engagement in school environment, serving of healthier, less processed food to students, and connection between home and school environment) were discarded because they loaded onto more than one component (or factor). Factor loadings for the two items on factor two ranged from 0.81 to 0.82. Internal consistency for factor one ($\alpha= 0.89$) and factor two ($\alpha= 0.89$) was substantial.

Table 3-1. Demographic Characteristics of Survey Participants	
Characteristics	Total Sample (n = 187)
n (%)	
Title	
Foodservice Director	145(78)
Foodservice Manager	24(13)
Foodservice Employee	4(2)
Other	14(7)
Registered Dietitian¹	
Yes	35(19)
No	150(81)
Geographic Location	
Midwest	102(54)
South	73(39)
Northeast	12(6)
Student Enrollment²	
< 2500	86(47)
2501-5000	35(19)
5001-7500	7(4)
7501-10000	12(7)
10001-15000	15(8)
15001-25000	11(6)
25001-50000	6(3)
> 50000	1(.55)
NSLP⁶ Participation by Grade	
Elementary school ³	173(99)
Middle school ⁴	175(100)
High school ⁵	171(99)

¹ Data missing from 2 participants who declined to answer the question.

² Data missing from 6 participants who declined to answer the question.

³ Data missing from 14 participants who declined to answer the question.

⁴ Data missing from 12 participants who declined to answer the question.

⁵ Data missing from 16 participants who declined to answer the question.

⁶ NSLP= National School Lunch Program

Table 3-2. Means and Standard Deviations for Knowledge Items		
Items¹	Means	Standard Deviations
Q1: How similar is the USDA definition to what you had in mind prior to the survey?		
<i>Similar</i>	3.62 ²	1.07
Q2: How well do you understand “family-style meals” based on the USDA definition?		
<i>Understand</i>	3.99 ³	0.94
Q3: How confident are you in your ability to apply “family-style meals” based on the on the USDA definition?		
<i>Confident</i>	2.98 ⁴	1.26

¹The item names are italicized.

²Total n= 186 with all items scored on a scale of 1-5 (1= not at all similar and 5= very similar).

³Total n= 186 with all items scored on a scale of 1-5 (1= not very well and 5= very well).

⁴Total n= 186 with all items scored on a scale of 1-5 (1= not at all confident and 5= very confident).

Table 3-3. Means and Standard Deviations for Attitude Items		
Items¹	Means	Standard Deviations
Q1: The application of "family-style meals" in a school lunch environment could...		
<i>Provide students the opportunity to socialize with adults during the lunch period</i>	3.49 ²	0.87
<i>Enhance a students willingness to try new foods</i>	3.40 ²	0.96
<i>Meet government regulations by offering all food components</i>	3.58 ²	0.99
Q2: Adult supervision during the application of "family-style meals" in a school lunch environment could...		
<i>Provide students the opportunity to build social skills by conversing with adults</i>	3.55 ³	0.88
<i>Provide students a role-model to encourage positive selection of food components</i>	3.70 ³	0.85
<i>Promote a holistic school environment (meeting the physical, mental, and social factors for student development)</i>	3.52 ³	0.85
Q3: Aside from the nutritional aspect of school lunch, "family-style" meals for students should encompass "learning" where students...		
<i>Learn about how food is acquired, produce, and served at school</i>	3.42 ⁴	0.90
<i>Learn about the health benefits of food served</i>	3.68 ⁴	0.86
<i>Apply the nutritional knowledge they learned in the classroom to make healthy choices during lunch</i>	3.78 ⁵	0.80
Q4: Potential barriers when serving school lunch to students using "family-style meals" could be a lack of...		
<i>Resources (dishes, serving bowls, utensils)</i>	4.11 ⁶	0.97
<i>Adequate staffing (foodservice and adults)</i>	4.52 ⁶	0.75
<i>Preparation time (prepare food)</i>	3.96 ⁶	1.07
<i>An easy method to assess that federal requirements are met for reimbursable meals</i>	3.54 ⁶	1.42
<i>Money</i>	4.07 ⁶	1.03
<i>Facility space (enough space to prepare and serve the food)</i>	3.91 ⁶	1.09

¹ The item names are italicized.

² Total n= 131 with item scored on a scale of 1-5 (1= strongly disagree and 5= strongly agree).

³ Total n= 187 with item scored on a scale of 1-5 (1= strongly disagree and 5= strongly agree).

⁴ Total n= 185 with item scored on a scale of 1-5 (1= strongly disagree and 5= strongly agree).

⁵ Total n= 186 with item scored on a scale of 1-5 (1= strongly disagree and 5= strongly agree).

⁶ Total n= 186 with item scored on a scale of 1-5 (1= strongly disagree and 5= strongly agree).

Table 3-4. Means and Standard Deviations for Interest/Motivation Items		
Items¹	Means	Standard Deviations
Q1: My interest in learning more about the use of “family-style meals” in a school lunch environment will be motivated by increased...		
<i>Student consumption of fruits and vegetables</i>	3.90 ²	0.91
<i>Students willingness to try new foods</i>	3.89 ²	0.95
<i>Community engagement in school environment</i>	3.62 ²	0.97
<i>Serving of healthier, less processed food to students</i>	3.56 ²	1.02
<i>Connections between home and school environment</i>	3.72 ³	0.91
<i>Student socialization with peers</i>	3.41 ⁴	0.93
<i>Student socialization with adults</i>	3.47 ²	0.93
Q2: My interest in learning more about the use of “family-style meals” in a school lunch environment will be motivated by....		
<i>Reduced production costs</i>	3.47 ⁵	0.98
<i>Reduced plate waste</i>	3.89 ⁶	0.93
<i>Increased number of meals reimbursed</i>	3.82 ⁶	0.99
<i>Meeting food safety requirements</i>	3.67 ⁶	1.09
<i>Reduced overall costs</i>	3.79 ⁶	1.03

¹ The item names are italicized.

² Total n= 186 with item scored on a scale of 1-5 (1= not at all interested and 5=very interested).

³ Total n= 185 with item scored on a scale of 1-5 (1= not at all interested and 5=very interested).

⁴ Total n= 184 with item scored on a scale of 1-5 (1= not at all interested and 5=very interested).

⁵ Total n= 184 with item scored on a scale of 1-5 (1= not at all interested and 5=very interested).

⁶ Total n= 187 with item scored on a scale of 1-5 (1= not at all interested and 5=very interested).

	Yes (%)	No (%)	Maybe (%)	Not sure (%)
Has this survey made you more interested in the concept of "family-style meals" in a school lunch environment? ¹	26	34	32	7
Has this survey made you more receptive to the application of "family-style meals" in a school lunch environment? ¹	21	32	36	10

¹ Total n= 185

	Not at all interested				Very interested
	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
Regardless of the barriers, how interested are you in learning more about the application of "family-style meals" in the school lunch environment? ¹	24.6	13.9	25.1	33.7	5.9

¹ Total n= 187 with scores on a scale of 1-5 (1= not at all interested and 5= interested).

Items	Factor Loadings ³
	Factor 1 ⁶
Similar ^{1,4}	0.83
Understand ^{2,5}	0.84
Eigenvalue	1.84
Variance explained	61%

¹ Total n= 187 with all items scored on a scale of 1-5 (1= not at all similar and 5= similar).

² Total n= 187 with all items scored on a scale of 1-5 (1= not very well at all and 5= very well).

³ Factor loadings refer to correlations between factors and variables that emerged from the principal components analysis.

⁴ Item refers to the question, “How similar is the USDA definition to what you had in mind prior to the survey?”

⁵ Item refers to the question, “How well do you understand “family-style meals” based on the USDA definition?”

⁶ Factor labeled as, “knowledge of a family-style meal service.”

Items	Factor Loadings ²		
	Factor 1 ³	Factor 2 ⁴	Factor 3 ⁵
Opportunity to socialize with adults ⁶	0.77	0.21	-0.02
Enhance a student’s willingness to try new foods ⁶	0.67	0.26	0.10
Opportunity to build social skills by conversing with adults ⁶	0.86	0.21	-0.07
Provide students an adult role-model ⁷	0.76	0.29	-0.04
Eigenvalues	3.49	2.75	2.61
Variance explained	33%	17%	8%

¹ Total n= 130 with all items scored on a scale of 1-5 (1= strongly disagree and 5= strongly agree)

² Factor loadings refer to correlations between factors and variables that emerged from the principal components analysis with varimax rotation.

³ Factor labeled as, “attitudes towards family-style meal service benefits.”

⁴ Factor labeled as, “attitudes towards family-style meal service benefits aside from nutrition.”

⁵ Factor labeled as, “attitudes towards family-style meal service barriers.”

⁶ Item refers to survey question, “The application of “family-style meals” in a school lunch environment could...”

⁷ Item refers to survey question, “Adult supervision during the application of “family-style meals” in a school lunch environment could...”

Items	Factor Loadings²		
	Factor 1³	Factor 2⁴	Factor 3⁵
Learn about how food is acquired, produced, and served at school ⁶	0.38	0.75	-0.05
Learn about the health benefits of food served ⁶	0.35	0.80	-0.01
Apply the nutritional knowledge they learned in the classroom to make healthy choices during lunch ⁶	0.30	0.81	-0.09
Meet government regulations by offering all food components ⁶	0.15	0.56	0.07
Resources ⁷	-0.10	0.20	0.71
Adequate staffing ⁷	-0.16	0.18	0.59
Preparation time ⁷	0.14	-0.26	0.65
An easy method to assess that federal requirements are met for reimbursable meals ⁷	0.34	-0.04	0.52
Money ⁷	0.01	-0.05	0.70
Facility space ⁷	0.03	-0.07	0.71
Eigenvalues	3.49	2.75	2.61
Variance explained	33%	17%	8%

¹ Total n= 130 with all items scored on a scale of 1-5 (1= strongly disagree and 5= strongly agree).

² Factor loadings refer to correlations between factors and variables that emerged from the principal components analysis with varimax rotation.

³ Factor labeled as, "attitudes towards family-style meal service benefits."

⁴ Factor labeled as, "attitudes towards family-style meal service benefits aside from nutrition."

⁵ Factor labeled as, "attitudes towards family-style meal service barriers."

⁶Item refers to survey question, "Aside from the nutritional aspect of school lunch, "family-style" meals for students should encompass "learning" where students....

⁷Item refers to survey question, "Potential barriers when serving school lunch to students using "family-style meals" could be a lack of..."

Items	Factor Loadings²	
	Factor 1³	Factor 2⁴
Reduced production cost ⁵	0.87	0.07
Reduced plate waste ⁵	0.70	0.30
Increase the number of meals reimbursed ⁵	0.82	0.18
Meeting food safety requirements ⁵	0.78	0.12
Reduced overall cost ⁵	0.82	0.12
Student socialization with peers ⁶	-0.08	0.82
Student socialization with adults ⁶	0.03	0.81
Eigenvalues	4.47	3.65
Variance explained	52%	15%

¹ Total n= 181 with all items scored on a scale of 1-5 (1= not at all interested and 5= very interested).

² Factor loadings refer to correlations between factors and variables that emerged from the principal components analysis with varimax rotation

³ Factor labeled as, “interest/motivation towards a family-style meal service based on ability to reduce potential barriers.”

⁴ Factor labeled as, “interest towards a family-style meal service based on ability to enhance children’s physical and social health.”

⁵ Item refers to survey question, “My interest in learning more about the use of “family-style meals” in a school lunch environment will be motivated by...”

⁶ Item refers to survey question, “My interest in learning more about the use of “family-style meals” in a school lunch environment will be motivated by increased...”

Chapter IV

Discussion

IV. Discussion

Previous research in the home, nursing home, and childcare environments suggests that a family-style meal service promotes, enhances, and improves the health and well being of individuals across the lifespan. Despite this evidence, research on a family-style meal service in a school foodservice setting is limited, with a majority of the research dating back to the 1980's and early 2000's (Cain, 1984; Donnelly et al., 2000). Therefore, the overall purpose of the present study was to identify promoters, barriers, and perceptions to a family-style meal service in a school foodservice setting. To accomplish this objective, the study was conducted in two phases and utilized a mixed methodology approach consisting of qualitative (phase I) and quantitative (phase II) research designs. Phase I consisted of focus groups and individual interviews with parents, teachers, and children. The primary objective of phase I was to identify the promoters, barriers, and perceptions to a family-style meal service in a school foodservice setting. During phase II, a survey instrument was developed to assess knowledge, attitudes, level of exposure, and interest/motivation of foodservice directors and school personal towards the use of a family-style meal service in a school foodservice setting. To the best of our knowledge, this is the first and most recent study to utilize a mixed-methodology research design to examine and assess a family-style meal service in a school foodservice setting.

Grounded in the theoretical framework of the Social Ecological Model (SEM) (Sallis et al. 2008; Gregson et al. 2001; Story et al. 2008), Phase I of the study identified

numerous themes at the individual, social, physical, and macro environmental levels to describe the promoters, barriers, and perceptions of adult focus group and individual interview participants towards family-style meals in a school foodservice setting. At the individual level, life-skill and food preference development were identified as promoters related to the family-style meal service. In terms of life-skill development, the study identified that the family-style meal service increased children's social development. Harnack et al. (2012) suggests that passing food around the table to peers during the family-style meal service may help increase social development for children. Authors of memorandums for the use of a family-style meal service with young children have noted similar findings (NFSMI, 2003; NFSMI, 2003). The study also identified that the family-style meal service positively enhanced the development of self-help skills such as manners, washing hands, and proper mealtime etiquette. Practical manuals for feeding young children also suggest that the family-style meal service promotes a child's development of self-help skills (Cryer, Ray & Harms, 1994; Mogharreban & Nahikian-Nelms, 1996).

At the individual level, food preference development was identified as a secondary theme. Study results suggest that the family-style meal service facilitates food preference development through increased exposure to new foods. This is an important finding in our study as repeated exposures (10-15 exposures) to new foods can result in greater likelihood of young children trying and accepting these foods (Birch & Fisher 1998; Birch, 1980). The social context of meals also plays a role in food preference development.

At the social environmental level, the present study identified that adult presence during mealtimes was a key promoter to a family-style meal service. Study results suggest that when adults eat with the children during mealtimes, they serve as organizers, facilitators, and most importantly role models. Past research has also reported increased adult role modeling during a family-style meal service (Gable, 2001). Adult role modeling was also found to positively enhance the development of healthy eating behaviors in the present study. Adult participants discussed how they would encourage the children to try foods and talk to them about the foods being served during mealtimes. Studies by Sigman Grant et al. (2008) and Gable (2001) reported teachers or caregivers trying new foods, teaching the name of new foods, and actively engaging in conversations with the children during a family-style meal service. Aside from the development of healthy eating behaviors, adult role models may also affect children's food choices and patterns (Birch & Fletcher 1998; Birch 1980).

A primary goal of the NSLP is to increase children's consumption of fruits and vegetables. However, current evidence suggests that plate waste for fruit, vegetables, and salads range from 20%-40% (Buzby & Guthrie, 2002). A study assessing school lunch waste among middle school students reported 47% of fruit and 74% of vegetables as being discarded (Cohen, Richardson, Austin, Economos & Rimm, 2013). After implementation of the new National School Lunch Program guidelines (Byker, Farris, Marcenelle, Davis, & Serrano, 2014), total weekly plate waste of 45.3% was reported among younger children (pre-kindergarten to kindergarten) with the greatest amount of waste generated from main entrees, milk, and vegetables (Byker et al. 2014). Based on

this evidence, the incorporation of a family-style meal service in school foodservice settings may result in increased consumption and decreased plate waste of fruits and vegetables due to the potential benefit of having adult role models during mealtimes. Additional research is needed to investigate the relationship between adult role modeling during a family-style meal service and its effect on children's food selection and consumption during mealtimes.

The physical environment of schools also plays a substantial role in the development of healthy eating behaviors and lifestyle habits in children. Over the years, changes have been made to the physical environment of schools, particularly to the school food environment. Such changes have included past interventions focused on improving food consumption such as increasing children's intake of fruits, vegetables, and whole-grains (Cohen, Richardson, Parker, Catalano & Rimm, 2014; Cohen, Rimm, Austin, Hyatt, Kraak & Economos, 2014), limiting beverage selections (Hanks, Just & Wansink 2014), and limiting the availability of competitive foods (Sallis, McKenzie, Conway, Elder, Prochaska, Brown & Alcaraz, 2003; Story et al. 2008) However, the results of these studies have been met with limited success and concerns have ensued over whether the current school environment promotes healthy eating behaviors and lifestyle habits in children (Kubik, Lytle, Hannan, Perry & Story, 2003; Story, & Neumark-Sztainer, 1999; Wechsler, Brener, Kuester & Miller, 2001; O'Toole, Anderson, Miller & Guthrie, 2007). Other concerns include the allotted time given to children for lunch (Bhatt, 2014; Conklin & Lambert, 2001) and the role of school architecture and design in health promotion (Gorman, Lackney, Rollings & Huang, 2007). Given these

concerns, one possible solution to improve school food environments may include utilizing different foodservice delivery methods, such as a family-style meal service.

In the present study a key finding was that the family-style meal service at the physical level promoted a healthy eating environment. Two environmental factors essential to the promotion of a healthy eating environment and the development of healthy eating behaviors in children include availability and accessibility. Availability is concerned with the presence of food in the home or school, while accessibility relates to how foods are prepared, presented, or maintained (Hearn, Baranowski, Baranowski, Doyle, Smith, Lin & Resnicow, 1998). Collectively, both factors have the potential to encourage or impede a child's acceptance, willingness to try, and consumption of certain foods (Hearn, Baranowski, Baranowski, Doyle, Smith, Lin & Resnicow, 1998). From our study results we identified that the family-style meal service may afford greater accessibility of food compared to other methods of service because food is placed in common dishes at the center of the table. However, more research is needed to compare the effect of a family-style meal service versus other methods of service on the availability and accessibility of foods and children's consumption of these foods in a school foodservice setting.

At the macro environmental level, strategies to meet the NSLP guidelines with a family-style meal service were identified. Overall, adult participants felt that meeting the NSLP guidelines was the primary responsibility of the kitchen staff. To meet NSLP guidelines and qualify for reimbursement, the kitchen staff had to ensure that the proper portions for each food component were being placed on the table. Future research should

focus on specific training programs related to meeting the NSLP guidelines during the use of a family-style meal service in a school foodservice setting. Additionally, other issues related to meeting the NSLP guidelines should be addressed such as efficient strategies to track the number of reimbursable meals.

To the best of our knowledge, phase II of the present study was the first study to assess knowledge, level of exposure, attitudes, and interest/motivation of foodservice directors and school personal towards a family-style meal service in a school foodservice setting. Frequency distributions for demographic characteristics showed that a majority of survey participants held the title, “foodservice director” and were not Registered Dietitians. Additionally, greater than 99% indicated all grade levels including elementary school, middle school, and high school participated in the National School Lunch Program. These findings are similar to previous survey results conducted with foodservice directors or other nutrition and food personal (Rosen, Arndt & Marquart, 2013)

Survey results indicated that forty percent of participants felt that the USDA definition of a family-style meal service was similar to their knowledge prior to completing the survey. Additionally, 37% responded that they understood the USDA definition. However, only 9% of survey participants felt confident in their ability to apply a family-style meal service in a school foodservice setting based on the definition provided. This lack of knowledge may be best explained by participant’s level of exposure. We identified that only 26% of participants had previous exposure to a family-style meal service, whereas 71% did not. Overall, this lack of knowledge indicates a need

to train foodservice directors and school personal on standard operating procedures related to the incorporation of a family-style meal service in a school foodservice setting.

Similar to knowledge, attitudes of foodservice directors and school personal were also assessed. Identified barriers to a family-style meal service were lack of money (4.07 ± 1.03), facility space (3.91 ± 1.09), resources (4.11 ± 0.97), and adequate staffing (4.52 ± 0.75). An additional barrier identified in the present study was plate waste. Over half (53%) of participants indicated that they would be interested/motivated to move towards a family-style meal service based on the ability to decrease plate waste. The identification of these potential barriers is consistent with published survey results from school food authorities related to the challenges they face when implementing new meal standards (PEW Charitable Trusts & Robert Wood Foundation, 2013). Based on this evidence it seems logical that changes to the foodservice delivery method, such as implementing a family-style meal service, would present similar challenges to those resulting from the incorporation of new meal standards. Future research should examine the effect of a family-style meal service in alleviating these barriers.

Past research has shown that the use of a family-style meal service in childcare and nursing home settings can result in increased socialization and communication for participants during mealtimes (Altus et al. 2002; NFSMI, 2003). Although minimal research has explored the relationship between a family-style meal service and its effect on a child's socialization and communication during school mealtimes, our survey results support the concept. Over half (52%) of participants agreed that children could build social skills by conversing with adults during a family-style meal service. Furthermore,

participants indicated that interest in learning more about a family-style meal service would be motivated by increased student socialization with peers (40%) and adults during mealtimes (42%). Interestingly, only 11% of participants disagreed with these statements. These results suggest that foodservice directors and school personal attitudes and interest/motivation to a family-style meal service are not focused entirely on meeting children's physical needs through nutrition and compliance with school meal standards. Rather, our study results suggest that foodservice directors and school personal are concerned with other dimensions of a child's health such as their social development.

Exploratory factor analysis using principal components analysis with varimax rotation revealed a one-component (or factor) solution for knowledge, a three-component (or factor) solution for attitudes, and a two-component (or factor) solution for interest/motivation. The one component (or factor) for knowledge labeled, "knowledge of a family-style meal service," included two items (three originally), and explained 61% of the variance. The internal consistency was considered substantial ($\alpha = 0.73$) after removing the item labeled, "confidence." Exploratory factor analysis of attitude items ($n=15$) identified three components (or factors): 1) Attitudes towards family-style meal service benefits; 2) Attitudes towards family-style meal service benefits aside from nutrition; and 3) Attitudes towards family-style meal service barriers. Factor loadings on all components (or factors) were above 0.40 with a range from 0.56 to 0.87. Internal consistency across all components (or factors) was considered substantial ranging from 0.79 to 0.91. Despite these findings, factor two may need further development because three of the four items (learn about how food is acquired, produced, and served at school,

learn about the health benefits of food served, and apply the nutritional knowledge they learned in the classroom to make healthy choices during lunch) also loaded onto factor one (0.38, 0.35, and 0.30). However, the factor loadings were not considered high; therefore, they were included in the final analysis.

Two-components (or factors) were identified for interest/motivation. Factor one labeled, “interest/motivation towards a family-style meal service based on ability to reduce potential barriers,” contained five items and explained 52% of the variance. Factor two contained two items (seven originally), explained 15% of the variance and was labeled, “interest towards a family-style meal service based on ability to enhance children’s physical and social health.” Five items from factor two were discarded because they loaded onto more than one component. Due to the elimination of several items in factor two; future research should consider further development of this factor. Because the factor is related to social health, participants may not have understood the context of the items in relation to a school foodservice setting because social health is not a dimension of health that is often considered when serving school meals to children. Currently, the emphasis has been solely on promoting the physical health of children by improving the nutritional quality and quantity of foods served (Cohen et al. 2014; Hanks et al. 2014; Sallis et al. 2003).

Through explanatory factor analysis, our study developed a validated instrument that measures the knowledge, attitudes, and interest/motivation of foodservice and school administrators towards a family-style meal service. This is the first study to develop and test such an instrument. Overall, the results can be used in future research to examine a

family-style meal service in a school foodservice setting. Future research can use the components (or factors) identified in this study to further assess the knowledge, attitudes, and interest/motivation of foodservice directors and school administrators not sampled in the present study. Because of the relatively low response rate (32%) administration of this survey on a broader scale with a diverse sample is warranted. Moreover, the findings can be utilized in the development of additional surveys targeted towards other stakeholders involved in school foodservice settings such as, parents, teachers, school district personnel and government or state officials.

The current study has some limitations. In Phase I, a small convenience sample was recruited, which limits the generalizability of the research findings to a broader sample in other geographic locations. Conducting individual interviews over the phone was another limitation in Phase I. Although phone interviews are convenient, phone interviews unlike focus groups do not allow researchers to document changes to non-verbal behavior such as body language (Summers, 2013). Another limitation was the exclusion of the child focus group results. Analysis of the child focus group transcripts provided the research team with a wealth of information related to favorite foods of the children and their likes and dislikes about school meals. However, specific information related to promoters, barriers, and perceptions of a family-style meal service in a school foodservice setting was insufficient. Reasons for this include differences between the developmental stages, understanding, and social worlds of children versus adults (Morgan, Gibbs, Maxwell, Britten, 2002).

Similar to phase I, there were limitations in phase II that should be discussed. First, the recruitment of survey participants was an inherent limitation to phase II of the present study. As previously mentioned, a convenience sample of foodservice directors and school administrators was generated from select states rather than a random national sample from each state. Reasons for this included lack of financial resources to administer a paper survey using the United States postal service. Additionally, consent was not provided by each state SNA to obtain their membership lists, which contributed to the generation of a convenience sample. Another limitation of the present study includes the relatively low overall response rate for the survey (32%), which may have resulted in response bias. Lee et al. (2014) reported that low response rates among foodservice directors could be attributed to limited access to the Internet. Past research suggests that the range of response rates for an online survey can be wide, between 6-75% (Sheehan & McMillan, 1999). Although the response rate was relatively low, it was within the range (24-50%) of response rates of foodservice directors or other food and nutrition personal previously reported in the literature (Gilmore, Maillet, & Mithell, 1997; Roger, 2003; Rosen, Arndt & Marquart, 2013; Lee, Kwon & Sauer, 2013).

Conclusions

In 1946, President Harry S. Truman signed into Congress the National School Lunch Act, which authorized the National School Lunch Program (Gunderson, 2003; Cain, 1984). On that day, the purpose and philosophy of the program was established to, “safeguard the health and well-being of the nation’s children and to encourage the

domestic consumption of nutritious agricultural commodities and other food.” However, a historical perspective of the NSLP provides a story to depict how the program’s goal to, “safeguard the health and well-being of children,” became lost to economic and agricultural concerns.

The World Health Organization defines health as not merely the absence of disease and infirmity but a complete state of physical, mental, and social well-being (World Health Organization, 1948). Results from the present study suggest that a family-style meal service in a school foodservice setting may be a more holistic approach to promoting the health and well-being of children. We identified that this method of service positively enhances the physical and social dimensions of health for children. From these findings, we can conclude that a family-style meal service in a school foodservice setting provides all the Nation’s children from various backgrounds an opportunity to develop the skills necessary to be successful whether its related to learning about life, about health, or about being in the presence of others.

Implications for Future Research

This study identified several promoters, barriers, and perceptions related to a family-style meal service in a school foodservice setting. Furthermore, we identified foodservice director and school administrator’s knowledge, attitudes, and interest/motivation towards this method of service. Based on the findings from this study, future research should focus on the following:

1. Qualitative research in the form of focus groups and individual interviews with parents, teachers, and children that currently use a traditional (cafeteria) style meal service in a school foodservice setting to identify promoters, barriers, perceptions towards this style versus the family-style meal service.
2. Qualitative and Quantitative research with government officials to identify strategies to further meet the National School Lunch Program guidelines and regulations with a family-style meal service.
3. Randomized controlled trials in school foodservice settings to investigate the effect of a family versus traditional (cafeteria) style meal service on current school challenges related to school lunch including cost, staffing, food plate waste, and compliance with school meal standards.
4. Randomized controlled trials in conjunction with plate waste procedures in a school foodservice setting to investigate the effect of a family versus traditional (cafeteria) style meal service on children's food consumption, choices, preferences, and energy intake during mealtimes.
5. Observational studies to assess the impact of a family-style meal service on children's social development and the impact of adult role modeling on children's food choices, consumption, and preferences during mealtimes.

References

- Alderman, H., & Bundy, D. (2012). School Feeding Programs and Development: Are We Framing the Question Correctly?. *The World Bank Research Observer*, 27(2), 204-221.
- Altus, D. E., Engelman, K. K., & Mathews, R. M. (2002). Using family-style meals to increase participation and communication in persons with dementia. *Journal of Gerontological Nursing*, 28(9), 47.
- Barnes, S., Wasielewska, A., Raiswell, C., & Drummond, B. (2013). Exploring the mealtime experience in residential care settings for older people: an observational study. *Health & social care in the community*, 21(4), 442-450.
- Bennett, K. K., Weigel, D. J., & Martin, S. S. (2002). Children's acquisition of early literacy skills: Examining family contributions. *Early Childhood Research Quarterly*, 17(3), 295-317.
- Birch, L. L., & Fisher, J. O. (1998). Development of eating behaviors among children and adolescents. *Pediatrics*, 101(Supplement 2), 539-549.
- Birch, L. L. (1980). Effects of peer models' food choices and eating behaviors on preschoolers' food preferences. *Child development*, 489-496.
- Birch, L. L. (1980). The relationship between children's food preferences and those of their parents. *Journal of Nutrition Education*, 12(1), 14-18.
- Bhatt, R. (2014). Timing is Everything: The Impact of School Lunch Length on Children's Body Weight. *Southern Economic Journal*, 80(3), 656-676.
- Branen, L., Fletcher, J., Myers, L. (1997). Effects of pre-portioned and family-style food service on preschool children's food intake and waste at snacktime. *Journal of Research in Childhood Education*, 12(1), 88-95.
- Burgess-Champoux, T. L., Larson, N., Neumark-Sztainer, D., Hannan, P. J., & Story, M. (2009). Are family meal patterns associated with overall diet quality during the transition from early to middle adolescence?. *Journal of Nutrition Education and Behavior*, 41(2), 79-86.
- Burgess-Champoux, T. L., Rosen, R., Marquart, L., & Reicks, M. (2008). The development of psychosocial measures for whole-grain intake among children and their parents. *Journal of the American Dietetic Association*, 108(4), 714-717.

- Buzby, J. C., & Guthrie, J. F. (2002). Plate waste in school nutrition programs. *The Journal of Consumer Affairs*, 36(2), 220-238.
- Byker, C. J., Farris, A. R., Marcenelle, M., Davis, G. C., & Serrano, E. L. (2014). Food waste in a school nutrition program after implementation of new lunch program guidelines. *Journal of Nutrition Education and Behavior*, 4, 1-6.
- Cain, B (1984). Effect of family versus cafeteria style school lunch service on students' food preferences and nutrient intakes. Accessed from <
<https://archive.org/details/effectoffamilyve00cain> > [Accessed on May 13, 2013]
- Carpenter, C. R. S., Hann, H. R. N., & Yeatman, F. W. (1936). *Menus and recipes for lunches at school* (No. 246). US Dept. of Agriculture.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245-276.
- Christian, M. S., Evans, C. E., Hancock, N., Nykjaer, C., & Cade, J. E. (2013). Family meals can help children reach their 5 A Day: a cross-sectional survey of children's dietary intake from London primary schools. *Journal of Epidemiology and Community Health*, 67(4), 332-338.
- Cohen, J. F., Richardson, S., Austin, S. B., Economos, C. D., & Rimm, E. B. (2013). School lunch waste among middle school students: nutrients consumed and costs. *American journal of preventive medicine*, 44(2), 114-121.
- Cohen, J. F., Rimm, E. B., Austin, S.B., Hyatt, R. R., Kraak, V. I., & Economos, C. D. (2014). A food service intervention improves whole grain access at lunch in rural elementary schools. *Journal of School Health*, 84(3), 212-219.
- Cohen, J. F., Richardson, S., Parker, E., Catalano, P. J., & Rimm, E. B. (2014). Impact of the new US Department of Agriculture school meal standards on food selection, consumption, and waste. *American Journal of Preventive Medicine*, 46(4), 388-394.
- Columbia Daily Spectator. Volume LIX, Number 121, 21 April 1936 Accessed from <
<http://spectatorarchive.library.columbia.edu/cgi-bin/columbia?a=d&d=cs19360421-01.1.4&e=-----en-20--1--txt-txIN----->> [Accessed on June 1st, 2014].
- Conklin, M. T., & Lambert, L. G. (2001). Eating at School. A summary of NFSMI research on time required by students to eat lunch. *University of Mississippi: National Food Service Management Institute, Applied Research Division*, retrieved October, 3, 2005.

Cryer, D., Ray, A. R., & Harms, T. (1994). *Everyday learning: Hands-on nutrition activities for preschoolers*. Raleigh, NC: North Carolina Department of Public Instruction Services.

Doke, L. A., Feaster, C. A., & Predmore, D. L. (1977). Managing the "eat-and-run" behavior of adolescents via family-style dining. *Behavior Modification*, 1(1), 73-92.

Donnelly, J. E., Jacobsen, D. J., Legowski, P., Johnson, S., & McCOY, P. A. T. (2000). Family-style foodservice can meet US dietary Guidelines for elementary school children. *Journal of the American Dietetic Association*, 100(1), 103-105.

Elmståhl, S., Blabolil, V., Fex, G., Küller, R., & Steen, B. (1987). Hospital nutrition in geriatric long-term care medicine. I. Effects of a changed meal environment. *Comprehensive gerontology. Section A, Clinical and laboratory sciences*, 1(1), 29-33.

Eisenberg, M. E., Neumark-Sztainer, D., Fulkerson, J. A., & Story, M. (2008). Family meals and substance use: is there a long-term protective association?. *Journal of Adolescent Health*, 43(2), 151-156.

Eisenberg, M. E., Olson, R. E., Neumark-Sztainer, D., Story, M., & Bearinger, L. H. (2004). Correlations between family meals and psychosocial well-being among adolescents. *Archives of Pediatrics & Adolescent Medicine*, 158(8), 792.

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in Human Behavior*, 26(2), 132-139.

Food and Nutrition Services USDA, 2013-2014. Offer Versus Serve. Guidance for the National School Lunch Program and School Breakfast Program. Accessed from <<http://www.fns.usda.gov/sites/default/files/SP45-2013a.pdf>> [Accessed on June 16, 2014].

Fulkerson, J. A., Neumark-Sztainer, D., Hannan, P. J., & Story, M. (2008). Family meal frequency and weight status among adolescents: cross-sectional and 5-year longitudinal associations. *Obesity*, 16(11), 2529-2534.

Fulkerson, J. A., Story, M., Mellin, A., Leffert, N., Neumark-Sztainer, D., & French, S. A. (2006). Family dinner meal frequency and adolescent development: Relationships with developmental assets and high-risk behaviors. *Journal of Adolescent Health*, 39(3), 337-345.

Gable, S. (2001). Nutrition socialization experiences of children in the Head Start Program. *Journal of the American Dietetic Association*, 101(5), 572-7.

Gillman M, Rifas-Shiman S, Frazier A, Rockett H, Camargo C, Field A, Berkey C, Colditz G. Family dinner and diet quality among older children and adolescents. *Arch Fam Med*. 2000; 9:235-240.

Gilmore, C. J., O'Sullivan Maillet, Julie, & Mitchell, B. E. (1997). Determining educational preparation based on job competencies of entry-level dietetics practitioners. *Journal of the American Dietetic Association*, 97(3), 306-316.

Gorman, N., Lackney, J. A., Rollings, K., & Huang, T. T. K. (2007). Designer schools: the role of school space and architecture in obesity prevention. *Obesity*, 15(11), 2521-2530.

Gregson, J., Foerster, S. B., Orr, R., Jones, L., Benedict, J., Clarke, B., & Zotz, K. (2001). System, environmental, and policy changes: using the social-ecological model as a framework for evaluating nutrition education and social marketing programs with low-income audiences. *Journal of Nutrition Education*, 33, S4-S15.

Gunderson, G. W. (2003). *The national school lunch program: Background and development*. Nova Publishers.

Hanks, A. S., Just, D. R., & Wansink, B. (2014). Chocolate Milk Consequences: A Pilot Study Evaluating the Consequences of banning chocolate milk in school cafeterias. *PloS one*, 9(4), e91022.

Harnack, L. J., Oakes, J. M., French, S. A., Rydell, S. A., Farah, F. M., & Taylor, G. L. (2012). Results from an experimental trial at a Head Start center to evaluate two meal service approaches to increase fruit and vegetable intake of preschool aged children. *International Journal of Behavioral Nutrition and Physical Activity*, 9, 51.

Hearn, M. D., Baranowski, T., Baranowski, J., Doyle, C., Smith, M., Lin, L. S., & Resnicow, K. (1998). Environmental influences on dietary behavior among children: availability and accessibility of fruits and vegetables enable consumption. *Journal of Health Education*, 29(1), 26-32.

Institute of Education Sciences (IES): National Center for Education Statistics, Nutrition Education in Public Elementary and Secondary Schools; U.S. Public Law 103-448. 103d Cong., 2 Nov. 1994. Child Nutrition Act of 1966. Accessed from <<http://nces.ed.gov/surveys/frss/publications/96852/index.asp?sectionid=8> > [Accessed on June 1st, 2014].

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20, 141-151.

Kubik, M. Y., Lytle, L. A., Hannan, P. J., Perry, C. L., & Story, M. (2003). The association of the school food environment with dietary behaviors of young adolescents. *American Journal of Public Health*, 93(7), 1168-1173.

Krueger, R. A., & Casey, M. A. (2000). Focus groups. *A practical guide for applied research*, 3.

Larson, N. I., Neumark-Sztainer, D., Hannan, P. J., & Story, M. (2007). Family meals during adolescence are associated with higher diet quality and healthful meal patterns during young adulthood. *Journal of the American Dietetic Association*, 107(9), 1502-1510.

Levine, Susan. "The Politics of Lunch." Introduction. *School Lunch Politics: The Surprising History of America's Favorite Welfare Program*. Princeton: Princeton UP, 2008. 1. Print. Accessed from <<http://www.fns.usda.gov/sites/default/files/NSLP-Program%20History.pdf>> [Accessed on June 1st, 2014].

Mathey, M. F. A., Vanneste, V. G., de Graaf, C., de Groot, L. C., & van Staveren, W. A. (2001). Health effect of improved meal ambiance in a Dutch nursing home: a 1-year intervention study. *Preventive Medicine*, 32(5), 416-423.

Melin, L., & Götestam, K. G. (1981). The effects of rearranging ward routines on communication and eating behaviors of psychogeriatric patient, 14(1), 47-51.

Minnesota Department of Education. Accessed from <<http://education.state.mn.us/MDE/Welcome/SchOrg/>> [Accessed on September 20th, 2014].

Morgan, M., Gibbs, S., Maxwell, K., & Britten, N. (2002). Hearing children's voices: Methodological issues in conducting focus groups with children aged 7-11 years. *Qualitative Research*, 2(1), 5-20.

National Center on Addition and Substance Use at Columbia University (2011). The importance of family dinners VII. Accessed from <<http://www.casacolumbia.org/addiction-research/reports/importance-of-family-dinners-2011>> [Accessed on January 19th, 2014].

Neumark-Sztainer, D., Eisenberg, M. E., Fulkerson, J. A., Story, M., & Larson, N. I. (2008). Family meals and disordered eating in adolescents: longitudinal findings from project EAT. *Archives of pediatrics & adolescent medicine*, 162(1), 17.

Neumark-Sztainer, D., Hannan, P. J., Story, M., Croll, J., & Perry, C. (2003). Family meal patterns: associations with sociodemographic characteristics and improved dietary intake among adolescents. *Journal of the American Dietetic Association*, 103(3), 317-322.

Nijs, K., De Graaf, C., Kok, F. J., & Van Staveren, W. A. (2006). Effect of family style mealtimes on quality of life, physical performance, and body weight of nursing home residents: Cluster randomized controlled trial. *Bmj*, 332(7551), 1180-1184.

Nijs, K., de Graaf, C., Siebelink, E., Blauw, Y. H., Vanneste, V., Kok, F. J., & van Staveren, W. A. (2006). Effect of family-style meals on energy intake and risk of malnutrition in Dutch nursing home residents: a randomized controlled trial. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 61(9), 935-942.

Nunnally JC, Bernstein IH (1994). *Psychometric Theory*. New York, NY: McGraw Hill.

O'toole, T. P., Anderson, S., Miller, C., & Guthrie, J. (2007). Nutrition services and foods and beverages available at school: Results from the School Health Policies and Programs Study 2006. *Journal of School Health*, 77(8), 500-521.

P.L. 89-642, 89th Congress, 11 October 1966, 80 Stat. 885-890.

P.L. 111-296, 111th Congress, 13 December 2012, 3183 Stat. 124
<http://www.gpo.gov/fdsys/pkg/PLAW-111publ296/html/PLAW-111publ296.htm> >
[Accessed on June 1st, 2014].

Pollitt, E., Gersovitz, M., & Gargiulo, M. (1978). Educational benefits of the United States school feeding program: A critical review of the literature. *American Journal of Public Health*, 68(5), 477-481.

Poppendieck, J. (2009). *Free for all: fixing school food in America*. University of California Press, 28.

Rosen, R., Arndt, B., Marquart, L., (2013). Pasta dishes as a vehicle for meeting whole grain requirements in school meals: Challenges, opportunities and benefits. *Journal of Foodservice Management & Education*, 7(2), 16-21.

Rogers, D. (2003). Report on the ADA 2002 dietetics compensation and benefits survey. *Journal of the American Dietetic Association*, 103(2), 243-255.

Sallis, J. F., McKenzie, T. L., Conway, T. L., Elder, J. P., Prochaska, J. J., Brown, M., & Alcaraz, J. E. (2003). Environmental interventions for eating and physical activity: a randomized controlled trial in middle schools. *American Journal of Preventive Medicine*, 24(3), 209-217.

Sallis, J. F., Owen, N., & Fisher, E. B. (2008). Ecological models of health behavior. *Health Behavior and Health Education: Theory, Research, and Practice*, 4, 465-486.

School Nutrition Association (2000-2014). Child Nutrition Programs: Legislative History Highlights. Accessed from <
<http://www.schoolnutrition.org/Content.aspx?id=2374>> [Accessed on January 19th, 2014].

Sen, B. (2006). Frequency of family dinner and adolescent body weight status: evidence from the national longitudinal survey of youth, 1997. *Obesity*, 14(12), 2266-2276.

Sheehan, K., & McMillan, S. (1999). Response variation in e-mail surveys: An exploration." *Journal of Advertising Research*, 39 (4): 45-54.

Sigman Grant, M., Christiansen, E., Branen, L., Fletcher, J., & Johnson, S. (2008). About feeding children: Mealtimes in child-care centers in four western states. *Journal of the American Dietetic Association*, 108(2), 340-346.

Snow, C., & Beals, B. (2006) Mealtime talk that supports literacy development. *New Directions for Child and Adolescent Development*, 111: 51-66.

Story, M., & Neumark-Sztainer, D. (1999). Competitive foods in schools: issues, trends, and future directions. *Topics in Clinical Nutrition*, 15(1), 37-46.

Taveras, E. M., Rifas-Shiman, S. L., Berkey, C. S., Rockett, H. R., Field, A. E., Frazier, A. L., & Gillman, M. W. (2005). Family dinner and adolescent overweight. *Obesity Research*, 13(5), 900-906.

Texas Department of Agriculture (2009). History of the National School Lunch Program. Accessed from <
http://www.squaremeals.org/portals/8/files/arm/arm_section25-history.pdf> [Accessed on January 19th, 2014].

The National Food Service Management Institute at The University of Mississippi. (2003). Mealtime Memo For Childcare: Family-Style Dining in Child Care. Accessed from <
<http://www.nfsmi.org/documentlibraryfiles/PDF/20080609045003.pdf>> [Accessed on June 1st, 2014].

The National Food Service Management Institute at The University of Mississippi. (2003). *Mealtime Memo For Childcare: Serving Meals Family-Style*. Accessed from < <http://www.nfsmi.org/documentlibraryfiles/PDF/20080612082324.pdf>> [Accessed on January 19th, 2014].

USDA Dietary Guidelines. Accessed from <<http://www.usda.gov/wps/portal/usda/usdahome?contentid=2012/01/0023.xml>> [Accessed on June 1st, 2014].

USDA. National School Lunch Program. Accessed from <<http://www.fns.usda.gov/cnd/lunch/>> [Accessed on April 01, 2014].

Utter, J., Scragg, R., Schaaf, D., & Mhurchu, C. N. (2008). Relationships between frequency of family meals, BMI and nutritional aspects of the home food environment among New Zealand adolescents. *International Journal of Behavioral Nutrition and Physical Activity*, 5(1), 50.

VanBiervliet, A., Spangler, P. F., & Marshall, A. M. (1981). An ecobehavioral examination of a simple strategy for increasing mealtime language in residential facilities. *Journal of Applied Behavior Analysis*, 14(3), 295-305.

VanEgmond-Pannell, D. 1981. School foodservice. Westport, CN: AVI Publishing Company, Inc.

Werner, E. E., & Smith, R. S. (1992). *Overcoming the odds: High risk children from birth to adulthood*. Ithaca, NY: Cornell University Press.

Wechsler, H., Brener, N. D., Kuester, S., & Miller, C. (2001). Food service and foods and beverages available at school: Results from the School Health Policies and Programs Study 2000. *Journal of School Health*, 71(7), 313-324.

WHO Definition of Health. World Wide Health Organization. Accessed from < <http://www.who.int/about/definition/en/print.html>> [Accessed on June 16, 2014].

Lee, Y., Kwon, J., Sauer, K. (2013). Child nutrition professionals' knowledge and training practices regarding food allergies in U.S. schools. *Journal of Foodservice Management & Education*, 7(2), 8-15.

Appendices

Appendix A

Letter of support from school administration



University of Minnesota
Department of Food Science and Nutrition
Attn: Terri Burgess-Champoux and Renee Rosen
1334 Eckles Avenue
St. Paul, MN 55108

Breck School
123 Ottawa Avenue North
Minneapolis MN 55422-5189
763.381.8100
www.breckschool.org

May 3, 2013

To Whom It May Concern:

I have reviewed the research proposal by University of Minnesota Department of Food Science and Nutrition to conduct research at Breck School. It is my understanding that this project will conduct focus groups with various individuals. These individuals will include children as well as parents of children enrolled in kindergarten, 3rd and 4th grades. In addition, Breck staff will also be included in interviews or a focus group.

Breck School grants permission for this research to be conducted at the school. We hope that Breck School will be provided with a summary report of the findings. We recognize that the study team and design realizes the importance of assent and consent procedures in conducting this study.

The research group also understands that any additional University of Minnesota's IRB documentation will be provided to Breck School. We wish you the best of luck in investigating this interesting topic.

Respectfully,

A handwritten signature in black ink that reads "Peg Bailey".

Mrs. Peg Bailey
Lower School Director

Appendix B
Child Consent Form

CONSENT FORM

Style of Service: School Meals Study

Your child is invited to be in a research study about how school lunch is served. Students in Kindergarten and 3rd & 4th graders (who participate in the biddy program) during kindergarteners lunchtime in the Breck School are eligible to participate in this study. In addition, students that have attended Breck since kindergarten and were served lunch using a family-style of service. We ask that you read this form and ask any questions you may have before agreeing that your child can participate in the study.

This study is being conducted by: Teri Burgess-Champoux, PhD, RD, LD, Renee Rosen, PhD, RD, and Jamie Street, Graduate Student.

Background Information

The purpose of this study is to learn information about how school lunch is served and factors that affect intake during lunch. We will use this information to develop intervention programs for school meals that focus on incorporating family meal style into schools. Students in this study will participate in a discussion group with 5 to 6 other students from Breck School.

Procedures:

If your child agrees to be in this study, we would ask s/he to do the following things:

1. We are asking that your child participate in one discussion group with 5 to 6 other students at school. This discussion will be conducted during school. It should take no more than forty-five minutes and occur during recess at school.
2. Since the discussion will involve questions related to eating lunch at school, we ask that participating children purchase school lunch a minimum of three (3) times per week.

Risks and Benefits of being in the Study

The study has minimal risk: First, questions we ask may be personal, for example we may ask which foods your child likes to eat or their opinion about school meal service. You and your child are free to choose not to answer any questions that you do not want to answer. There are no benefits to participation.

Compensation:

A \$5 gift card to Target will be donated to the school for participation in the study.

Confidentiality:

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your child’s decision whether or not to participate will not affect his/her current or future relations with the University of Minnesota, St. Catherine University, or the Breck School District. If your child decides to participate, s/he is free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:

The researchers conducting this study are: Teri Burgess-Champoux, Renee Rosen, and Jamie Street. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact Teri Burgess-Champoux (651-690-8750, tlburgesschampoux@stkate.edu), Renee Rosen (952-451-6994, rose0560@umn.edu), or Jamie Street (651-233-8106, stree071@umn.edu).

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Research Subjects’ Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to have my child participate in this study.

Child
Name: _____

Grade: _____

How many times per week the child consumes the school lunch:

Signature of parent or guardian: _____ Date: _____

Signature of Investigator: _____ Date: _____

Appendix C
Child Assent Form

Child Assent Form
Style of Service: School Meals Study

Researchers at the University of Minnesota and St. Catherine University are asking you to be in a study about how lunch is served at school. They would like you to help them learn more about what you think about the style of lunch service at school. If researchers know what children think about how lunch is served they can help them learn how to make better food choices in the future.

If you agree to be in this study, we will ask you to participate in a group where questions related to school lunch will be discussed. The discussion will last for no more than 1 hour. This discussion will happen either during or after school.

All information will be kept private. In any report we might write, we will not identify you by name.

Being in the study is totally up to you and your decision whether to participate in the study will not affect your relations with the Breck School, the University of Minnesota, or St. Catherine University. If you change your mind, you can quit the study at any time.

You can ask any questions you have about the study. If you have a question later that you did not think of originally, you or your parent or guardian can call any of the University of Minnesota researchers for the study, Renee Rosen (952-451-6994), Jamie Street (651-233-8106), Teri Burgess-Champoux (651-690-8750).

Signing here means you have read this paper or had it read to you and that you are willing to be in this study. If you don't want to be in this study, don't sign. Remember being in this study is up to you and no one will be mad at you if you don't sign this or even if you change your mind later.

Signature of Participant _____

Signature of Person Explaining Study _____

Date _____

Appendix D
Teacher Consent Form

TEACHER CONSENT FORM
Style Of Service: School Meals Study

You have been invited to be in a research study entitled: Family-Style Meals in School Foodservice Settings: A Qualitative Study of Perceptions, Barriers and Promoters. You were selected as a possible participant because you are an employee in the Breck School district. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Renee Rosen, PhD, RD, University of Minnesota, Department of Food Science and Nutrition; Jamie Street, Graduate Student, University of Minnesota, Department of Food Science and Nutrition; and Teri Burgess-Champoux, PhD, RD, LD, St. Catherine University, Department of Nutrition and Exercise Sciences.

Background Information

The purpose of this study is to discuss with school district professionals the service style of meals in schools.

Procedures:

You will be asked to participate in a focus group today. You will meet with 6 to 8 other school district professionals and have the opportunity to discuss and express your opinions related to the style school lunch is served. In order to capture all of the information during this discussion, this session will be audio recorded.

Risks and Benefits of being in the Study:

The study has minimal risk. The subjects in this study will not endure any harm or discomfort greater than that ordinarily encountered in daily life. This study aims at recording information from individuals pertaining to the advantages and disadvantages of service style of meals at a school. To obtain all information the subjects will be audio recorded. Therefore the present study offers minimal risks for its subjects. There are no benefits to participation.

Compensation:

For your participation, we will donate a \$20 Target gift card to the school.

Confidentiality:

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research CD's will be stored securely and only researchers will have access to the CD's for analysis. There will be no direct identifiers in written form. In order to protect individual's privacy, enrolled subjects will be assigned a number so that no personal information will be revealed throughout this study.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota, St. Catherine University or the school district with whom you are affiliated. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Contacts and Questions:

The researchers conducting this study are: Renee Rosen, Jamie Street, and Teri Burgess-Champoux. You may ask any questions you have now. If you have questions later, you are encouraged to contact them at Renee Rosen at 952-451-6994, (rose0560@umn.edu), Jamie Street at 651-233-8106 (stree071@umn.edu), or Teri Burgess-Champoux at 651-690-8750, (tlburgesschampoux@stkate.edu). If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in this study.

Signature of Participant:

_____ Date: _____

Signature of Investigator:

_____ Date: _____

Age of children in the school where
employed _____

Title of position

Appendix E
Parent Consent Form

PARENT CONSENT FORM
Style of Service: School Meals Study

You have been invited to be in a research study entitled: Family-Style Meals in School Foodservice Settings: A Qualitative Study of Perceptions, Barriers and Promoters. You were selected as a possible participant because you are a parent of a child that attends Breck School. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Renee Rosen, PhD, RD, University of Minnesota, Department of Food Science and Nutrition, Jamie Street, Graduate Student, University of Minnesota, Department of Food Science and Nutrition, and Teri Burgess-Champoux, PhD, RD, LD, St. Catherine University, Department of Nutrition and Exercise Sciences.

Background Information

The purpose of this study is to discuss with parents the service style of meals in schools.

Procedures:

You will be asked to participate in a focus group today. You will meet with 6 to 8 other parents and have the opportunity to discuss and express your opinions related to the style service of school lunch. In order to capture all of the information during this discussion, this session will be audio recorded.

Risks and Benefits of being in the Study

The study has minimal risk. The subjects in this study will not endure any harm or discomfort greater than that ordinarily encountered in daily life. This study aims at recording information from individuals pertaining to the advantages and disadvantages of service style of meals at a school. To obtain all information the subjects will be audio recorded. Therefore the present study offers minimal risks for its subjects. There are no benefits to participation.

Compensation:

For your participation, we will donate a \$20 Target gift card to the school.

Confidentiality:

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research CD's will be stored securely and only researchers will have access to the CD's for analysis. There will be no direct identifiers in written form. In order to protect individual's privacy, enrolled subjects will be assigned a number so that no personal information will be revealed throughout this study.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota, St. Catherine University or the Breck school district. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

Additionally, this study is limited to 10 parents. Because we would like a sample from all the parents with children at the school, participants will be picked at random from all interested participants that send, call or email by the given date. You will be called and emailed if chosen of the date and time. If you are unable to attend you will forfeit your spot and it will be given to another random parent.

Contacts and Questions:

The researchers conducting this study are: Renee Rosen, Jamie Street, and Teri Burgess-Champoux. You may ask any questions you have now. If you have questions later, you are encouraged to contact them at Renee Rosen at 952-451-6994, (rose0560@umn.edu), Jamie Street at 651-233-8106 (stree071@umn.edu), or Teri Burgess-Champoux 651-690-8750, (tlburgesschampoux@stkat.edu). If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in this study.

Signature of Participant:

_____ Date: _____

Signature of Investigator:

_____ Date: _____

Age of children that participate in school lunch _____

Appendix F
Demographic Survey

Demographic Survey

Q1 Please indicate the highest level of education completed.

- Grammar School (1)
- High School or equivalent (2)
- Vocational/Technical School (2 year) (3)
- Some College (4)
- College Graduate (4 year) (5)
- Master's Degree (MS) (6)
- Doctoral Degree (PhD) (7)
- Professional Degree (MD, JD, etc.) (8)
- Other (9)

Q2 What is your gender?

- Female (1)
- Male (2)

Q3 What is your current marital status?

- Rather not say (1)
- Divorced (2)
- Living with another (3)
- Married (4)
- Separated (5)
- Single (6)
- Widowed (7)

Q4 Please indicate your current household income in U.S. dollars

- Rather not say (1)
- Under \$10,000 (2)
- \$10,000 - \$19,999 (3)
- \$20,000 - \$29,999 (4)
- \$30,000 - \$39,999 (5)
- \$40,000 - \$49,999 (6)
- \$50,000 - \$74,999 (7)
- \$75,000 - \$99,999 (8)
- \$100,000 - \$150,000 (9)
- Over \$150,000 (10)

Q5 How old are you?

- Under 13 (1)
- 13-17 (2)
- 18-25 (3)
- 26-34 (4)
- 35-54 (5)
- 55-64 (6)
- 65 or over (7) _____

Q6 Employer Type

- Employee of a for-profit company or business or of an individual, for wages, salary, or commissions (1)
- Employee of a not-for-profit, tax-exempt, or charitable organization (2)
- State government employee (3)
- Federal government employee (4)
- Self-employed in own not-incorporated business, professional practice, or farm (5)
- Self-employed in own incorporated business, professional practice, or farm (6)
- Working without pay in family business or farm (7)

Q7 Ethnicity

- Hispanic or Latino (1)
- Not Hispanic or Latino (2)
- Caucasian (3)
- African American (4)

Q8 Race

- American Indian or Alaska Native (1)
- Asian (2)
- Black or African American (3)
- Native Hawaiian or Other Pacific Islander (4)
- White (5)

Q9 Employment Status

- Employed for wages (1)
- Self-employed (2)
- Out of work and looking for work (3)
- Out of work but not currently looking (4)
- A homemaker (5)
- A student (6)
- Retired (7)
- Unable to work (8)

Appendix G

3rd and 4th Grade Focus Group Questions

3rd and 4th Grade Focus Group Questions

Opening question: Tell us your first name and how many times a week you biddy.

1. Tell me what you do when you are a biddy.
2. Tell me about the types of foods served to the kindergarteners when you biddy.
3. Tell me how eating lunch, as a biddy is different from eating lunch when you are not a biddy.
4. Besides serving food, what are some reasons you like being a biddy? (Probe for: food, socialization, manners, responsibility)
5. What are some reasons you do not like being a biddy?
6. First ask them to raise their hand on who went to kindergarten at Breck. Then break up into 2 questions...those that have attended kindergarten at Breck, what did you like about eating lunch? Then those that did not, what did you like about eating at your school (probe for: food, socialization, manners, responsibility).
7. Has being a biddy changed your eating habits (yes or no)?
8. Tell me how your eating habits have changed being a biddy? What foods do you like a lot and eat a lot of?

Appendix H
Teacher Focus Group Questions

Teacher Focus Group Questions

1. Please tell us your first name and your job title.
2. What grades do you serve family-style meals to in your school?
3. Do children at your school qualify for free and reduced meals?
4. Do students have the option to bring lunch from home?
5. How often do you participate in the school meal program (eat with the children)?
Make sure to obtain information related to why or why not participating.
6. Please discuss the positive characteristics of the school meal.
7. I have heard lots of great qualities of the school lunch; let's take a few minutes to discuss any negative characteristics?
8. I have heard both positive and negative items pertaining to school meals. What are your thoughts on serving family style in a school setting?
9. What do you think would have to change in the environment or administration to make this change? Let's discuss both benefits and barriers related to application.
Let's start with the benefits.
10. How do you think changing the style of serving lunch at school would impact your classroom or school? You can discuss personal factors of the children, behaviors, and even the environment. Let's discuss both positive and negative items starting with the positive.
11. How long have you worked at this school that serves family-meals?
12. Have you had experience working in another school that serves lunch using the traditional style of service? If have several responses, expand and ask to discuss the differences.
13. What would you say are the benefits of the family style?
14. I have heard quite a bit of positive things related to family-meals now lets discuss the potential barriers. What barriers are associated with the family-style meal service in a school setting?

Appendix I
Parent Focus Group Questions

Parent Focus Group Questions

1. Please tell us your first name and the age and grade of your child (ren).
2. How often does your child participate in the school meal program? Make sure to obtain information related to why or why not participating.
3. If your child participates in the national school lunch program, do you discuss or talk about what was consumed or taken for the meal? Make sure to find out how often these discussions take place---weekly, daily, not at all.
4. Please discuss the positive characteristics of the school meal (Probe for: nutritional, social, manners...etc.).
5. I have heard lots of great qualities of the school lunch; let's take a few minutes to discuss any negative characteristics? (Probe for: food, style of service, time to eat, time of day, where lunch is eaten (ambience))
6. I have heard both positive and negative items pertaining to school meals. As you may know, family meals are associated with increasing positive dietary intakes and healthy behaviors for children and teens including consuming more F/V and decreased plate waste. Although there is no universal accepted definition of family meals due to the challenge in defining family (as its form can vary considerably including nuclear family, extended family, blended family, single-parent family) as well as family meal (dinner or any meal consumed together). Family meals could be defined as: when two or more people eat together or when at least one adult and one child eat together. What are your thoughts on serving family style in a school setting?
 - a. What do you think would have to change in the environment or administration to make this change? Let's discuss both benefits and barriers related to application. Let's start with the benefits.
7. Now that we discussed the benefits and barriers to incorporating the family meal style of serving in school, what positive and negative qualities may your child gain from serving family meal style? (Probe for: manners, social, relationships, dietary habits, progress in school, behavior in the classroom)

8. Tell me a little about your meal structure in your home environment (Probe for: try to figure out if eating family meals, in front of television).
 - a. Note: purpose of this question is to see if family-meal at school has translated to the home setting.

9. How do you think changing the style of serving lunch at school would impact your meals at home? Positively and negatively.

Appendix J

Individual Interview Consent Form

Individual Interview Consent Form (used over the phone)

My name is Dr. Renee Rosen. I am a researcher for the Department of Food Science and Nutrition at the University of Minnesota. You are invited to be in a research study to help us understand the service style of meals in schools. Other investigators include Jamie Street, a graduate student in the Department of Food Science and Nutrition and Dr. Teri Burgess-Champoux from St. Catherine University. You were selected as a participant because you were identified as being a food service director that serves family meal style in your district. I ask that you listen as I read this form and ask any questions you may have before agreeing to be in the study.

Family meals seem to be beneficial in many aspects. However, very little research has investigated the family service style in schools. We are interested in the perception, barriers and promoters to incorporating family meals into the school food service operation. Therefore, we need to have a better understanding of the opportunities and threats to incorporating a family meal style service within a school district. We would like to interview a small number of food service directors/managers and use this information to develop a survey which we will administer to a larger group.

Now I will explain what we will ask you to do if you agree to be in this study.

We ask that you answer a series of questions on the phone; it will take about on average 20 to 30 minutes. The questions will pertain to the style of service in your school. In trying to be as objective as possible our questions are open ended therefore may seem awkward at times. I will be recording our conversation and later transcribe the information.

Now I would like to explain the risks and benefits of being in the study.

There are no benefits to you for being in this study. Possible risks include loss of time and an invasion of privacy in that we may ask personal questions such as: Please tell me about your current position and the type of work that you do, or How have you encountered the term family meals in your current setting? You are free to choose not to answer any of the questions that we ask. In return for participation you will receive a \$20 gift certificate from Target/Wal-Mart, which will be mailed to you after the interview is completed.

Data collected in this study will be aggregated and reported in summary format only. Your name will not be attached to the recording or transcription from the phone interview. The records of this study will be kept private. Research records will be stored securely and only researchers will have access to the records. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject.

Now I would like to explain the voluntary nature of the study.

Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or St. Catherine's University. If you decide to participate, you are free to withdraw at any time without affecting those relationships. If you withdraw from the study before we are finished you will not receive a \$20 gift card from Target.

The researchers conducting this study are Renee Rosen, Jamie Street, and Teri Burgess-Champoux. You may ask any questions you have now or if you have questions later, you can call 651-690-8750.

Do you have any questions now?

Will you please explain to me what you think we are going to ask you to do and the purpose of this study in your own words?

Is there anything more would you like to know about this current study or the procedure?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), contact Research Subjects' Advocate line, D528 Mayo, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455; telephone (612) 625-1650.

When your gift card is mailed, a copy of this information will be attached to keep for your records.

Do you consent to participate in the study? Yes No

Could you please give me the name and address of where you would like your gift card sent?

Appendix K

Individual Interview Questions

Individual Interview Questions

2. Please tell us your first name and how many lunch meals are served daily in your district (for directors) or school (for managers).
3. How has school lunch changed over past 5 years?
4. Tell me about the positive attributes of serving lunch to students using the traditional cafeteria style of service.
5. Tell me about the negative attributes of serving lunch to student's using the traditional cafeteria style of service.

Intro for Family-style Meal Questions

I have heard both positive and negative items pertaining to the way school meals are currently served. Family meals are associated with increasing positive dietary intakes and healthy behaviors for children and teens. Although there is no universal accepted definition of family meals due to the challenge in defining family (as its form can vary considerably including nuclear family, extended family, blended family, single-parent family) as well as family meal (dinner or any meal consumed together). Family meals could be defined as: when two or more people eat together or when at least one adult and one child eat together.

6. What were some of the reasons to implement family meals into your school?
(Only for FSD that currently serve family-style meals)
7. When did your school first implement this style of service? (Only for the FSD that currently serve family-style meals)
8. How likely is it that the school you work at will continue using the family-style of service? (Only for the FSD that currently serve family-style meals)
9. What benefits have you experienced and observed through using the family-style of service in a school environment?
10. What barriers have you experienced and observed through using the family-style of service in a school environment?

11. What feedback have you heard from parents, administrators, janitors, or children regarding their attitudes towards this style of service?
12. What benefits do you anticipate would arise if family-meals were to be implemented in the public school environment?
13. What barriers do you anticipate would arise if family-meals were to be implemented in the public school environment?
14. Ask this question to FSD that serve traditional or cafeteria style: If family meals have not been incorporated into the school lunch discuss who and what would be involved for schools to make the change from traditional to family style service.
15. In your opinion, what steps or evidence are needed to change the current lunch service to family meal style lunch service?

Appendix L
Family Meals Survey

Family Meals Survey

Q1 Consent Information: The records of this study will be kept private and accessed only by the researchers in a password protected encrypted file. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or St. Catherine University. If you decide to participate, you are free to withdraw at any time without affecting those relationships. Possible risks involved include a loss of time and an invasion of privacy. However, you are free to not answer any questions contained in the survey. If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher(s), contact Research Subjects' Advocate line, D528 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota 55455; telephone (612) 625-1650. You can keep a copy of this form for your records. **Statement of Consent:** I have read the above information. I have asked questions and have received answers. At this time, I give consent to participate in the study and complete the survey.

- Yes (1)
- No (2)

Q2 Choose the "title" that best reflects your current or most recent past position?

- Foodservice Director (District Level) (1)
- Foodservice Manager (School Level) (2)
- Foodservice Employee (School Level) (3)
- Other (4) _____

Q4 Are you a Registered Dietitian?

- Yes (1)
- No (2)

Q3 Please indicate the region of the United States in which you reside:

- West (WA, OR, CA, ID, MT, WY, CO, NM, AZ, NV, UT, MT) (1)
- Mid-west (ND, SD, NE, KS, MN, IA, MO, MI, WI, IL, IN, OH) (2)
- South (TX, OK, AR, LA, MS, TN, KY, AL, GA, FL, SC, NC, VA, WV, MD, DE, DC) (3)
- North East (ME, NH, NY, VT, PA, MA, RI, CT, NJ) (4)

Q5 Please indicate the percentage of students that receive free and/or reduced school meals in your district:

- < 10 (1)
- 11-19 (2)
- 20-29 (3)
- 30-39 (4)
- 40-49 (5)
- 50-59 (6)
- 60-69 (7)
- 70-79 (8)
- > 80 (9)

Q6 Please indicate the approximate number of students enrolled in your school district:

- < 2500 (1)
- 2501-5000 (2)
- 5001-7500 (3)
- 7501-10000 (4)
- 10001-15000 (5)
- 15001-25000 (6)
- 25001-50000 (7)
- >50000 (8)

Q7 Check the grade levels that participate in the National School Lunch Program in your school district (check all that apply)

- Elementary school (1)
- Middle school (2)
- High school (3)

Q8 There are a number of different methods used by schools to serve lunch to students and offer reimbursable meals. For example, a school may have cafeteria-style service, kiosks, meals in the classroom, A' la carte or a family-style meal service. The following statement is the U.S. Department of Agriculture (USDA) general definition for the use of a family-style meal service ("family-style meals") in a school lunch environment (refer to this summary when answering the questions below). 1. Family style meal service allows students to serve themselves from common dishes of food. 2. Assistance is given from supervising adults and the supervising adult should initially offer the full planned serving of each food component/food item to each student. 3. The supervising adult should encourage additional portions and selections as appropriate. 4. Family style meal service allows students to make choices in selecting foods. 5. Family style meal service must meet all of the daily and weekly food component/food item requirements, as well as the weekly dietary specifications. 6. Since replenishment is immediately available at each table, the initial serving of a food component/food item may be less than the full-required minimum serving size. **Based on the USDA bulleted summary of "family-style meals", rate your level of agreement with the following statements:**

	Not Very Similar (1)	Not Similar (2)	Not Similar or Similar (3)	Similar (4)	Very Similar (5)
How similar is the above definition to what you had in mind prior to this survey? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Please refer to the above summary of family-style meals when answering the following question:

	Not Very Well (1)	Not Well (2)	Not Well or Well (3)	Well (4)	Very Well (5)
How well do you understand "family-style meals" based on the above definition? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q10 Please refer to the above summary of family-style meals when answering the following question:

	Not Very Confident (1)	Not Confident (2)	Not Confident or Confident (3)	Confident (4)	Very Confident (5)
How confident are you in your ability to apply "family-style meals" based on the above definition? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 Have you had an opportunity to serve lunch to students using "family-style meals" in a school lunch environment?

- Yes (1)
- No (2)
- Not sure (3)

Q12 Briefly describe where you experienced the use of "family-style meals" in the school lunch environment:

Q13 Based on this experience, briefly describe the barriers to the use of "family-style meals" in a school lunch environment:

Q14 Based on this experience, briefly describe the benefits to the use of "family-style meals" in a school lunch environment:

Q15 The following is a bulleted summary of the USDA's general definition of a family-style meal service ("family-style meals") (refer to this summary when answering the questions below) 1. Family style meal service allows students to serve themselves from common dishes of food. 2. Assistance is given from supervising adults and the supervising adult should initially offer the full planned serving of each food component/food item to each student. 3. The supervising adult should encourage additional portions and selections as appropriate. 4. Family style meal service allows students to make choices in selecting foods. 5. Family style meal service must meet all of the daily and weekly food component/food item requirements, as well as the weekly dietary specifications. 6. Since replenishment is immediately available at each table, the initial serving of a food component/food item may be less than the full-required minimum serving size. **Based on the USDA bulleted summary of "family-style meals", rate your level of agreement with the following statements: The application of "family-style meals" in a school lunch environment could...**

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Provide students the opportunity to socialize with adults during the lunch period (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhance a students willingness to try new foods (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meet government regulations by offering all food components (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q16 Rate your level of agreement with the following statements based on the USDA bulleted summary of "family-style meals": Adult supervision during the application of "family-style meals" in a school lunch environment could...

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Provide students the opportunity to build social skills by conversing with adults (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide students a role-model to encourage positive selection of food components (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote a holistic school environment (meeting the physical, mental, and social factors for student development) (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q17 Rate your level of agreement with the following statements: Aside from the nutritional aspect of school lunch, "family-style" meals for students should encompass "learning" where students....

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Learn about how food is acquired, produced, and served at school (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn about the health benefits of food served (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply the nutritional knowledge they learned in the classroom to make healthy choices during lunch (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q18 Rate your level of agreement with the following statements: Potential barriers when serving school lunch to students using "family-style meals" could be a lack of..

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Resources (dishes, serving bowls, utensils) (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adequate staffing (foodservice, kitchen, and adults) (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparation time (prepare food, prepare servings into serving bowls) (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An easy method to assess that federal requirements are met for reimbursable meals (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Money (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facility space (enough space to prepare and serve the food) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q19 Regardless of the potential barriers, how interested are you in learning more about the concept of "family-style meals" in a school lunch environment?

- 1 Not at all interested (1)
- 2 Not interested (2)
- 3 Neither Interested or Dis-interested (3)
- 4 Interested (4)
- 5 Very interested (5)

Q20 Rate your level of agreement with the following statements: As a foodservice director/manager, my interest in learning more about the use of "family-style meals" in a school lunch environment will be motivated by...

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Reduced production costs (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduced plate waste (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased number of reimbursable meals served (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meeting food safety requirements (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduced overall costs (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q21 Rate your level of agreement with the following statements: As a foodservice director/manager, my interest in learning more about the use of family-style meals in a school lunch environment will be motivated by increased...

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Student socialization with peers (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student socialization with adults (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student consumption of fruits and vegetables (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Willingness of student's to try new foods (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community engagement within the school environment (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of healthier, less-processed food to the students (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Connections between the home and school environments (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q22 If you were to transition from your current style of service to "family-style meals" in a school lunch environment which of the following would motivate your decision? (check all that apply)

- Money (1)
- Resources (2)
- Increased student consumption of fruits and vegetables (3)
- Increased time for students to socialize (4)
- Ability of students to socialize with adults (5)
- Increased supervision of adults with students (6)

Q23 Regardless of the barriers, how interested are you in learning more about the application of "family-style meals" in the school lunch environment?

- 1 Not at all interested (1)
- 2 Somewhat Interested (2)
- 3 Neither Interested or Dis-interested (3)
- 4 Interested (4)
- 5 Very interested (5)

Q24 Has this survey made you more interested in the concept of "family-style meals" in a school lunch environment?

- Yes (1)
- No (2)
- Maybe (3)
- Not sure (4)

Q25 Has this survey made you more receptive to the application of "family-style meals" in a school lunch environment?

- Yes (1)
- No (2)
- Maybe (3)
- Not sure (4)

You have reached the end of the survey. Thank you for taking the time to complete the survey. The researchers of this study appreciate your feedback. You will be entered into a drawing to win an Apple iPad Mini. We ask that you please leave your name and email address. We will notify you by email if you are the chosen winner. The winner will be notified no later than March 9th, 2014. Thank you for taking the time to complete the survey. The researchers of this study appreciate your feedback.

Appendix M

School Nutrition Association Consent Phone Script

School Nutrition Association Consent Phone Script (used over the phone)

My name is Jamie Coborn. I am a graduate student in the Department of Food Science and Nutrition at the University of Minnesota. Myself along with two other investigators; Dr. Teri Burgess-Champoux, and Dr. Renee Rosen from the University of Minnesota are collaborating on a research study related to how different styles of service impact the delivery of school lunch to children. This past spring focus groups and individual interviews were conducted with children, parents, teachers, and administrative staff from a variety of schools. Findings from this data are being used to develop a survey, which we will administer to a larger group. Our target audience for the survey will be foodservice directors/managers in education settings from across the nation.

Due to funding, the survey will be administered using Qualtrics, an online survey tool offered through the University of Minnesota. To begin recruitment, we have been contacting all state School Nutrition Associations (SNA) asking for consent to release the email membership lists for foodservice directors/ managers of your association. From the membership lists we obtain, a random sample of foodservice directors/managers will be generated. Thereby, allowing for the researchers of this study to administer a survey to the foodservice directors/managers that are generated from the email membership list provided by your SNA association and other state SNA associations. At this time, I am asking for your consent to release the email membership list. Please understand that the Institutional Review Board's of the University of Minnesota and St. Catherine University have approved the research. The researchers contact with foodservice directors/managers is intended for "educational purposes" only. All information obtained is confidential. Participants will not be asked personal information during the survey and personal identifiers will not be included in the final report. At the conclusion of the study, all records will be destroyed.

The researchers conducting this study are Renee Rosen, Jamie Coborn (Street), and Teri Burgess-Champoux. You may ask any questions you have at this time.

At this time, do you consent to allow the researchers of this study to use your state membership email list to contact foodservice directors/managers inquiring about participation to complete a survey?

Yes

No

If you indicated yes, please send this back along with the email membership list.

Appendix N

Email To Survey Participant

Dear Fellow Foodservice Director/Manager/Personnel,

You are one of 1,000 Foodservice Directors/Managers randomly selected to participate in a national study entitled “Family-style meals in a school foodservice setting: an assessment of knowledge, attitudes, behavior/exposure and interest.” We received your contact information through your state School Nutrition Association. This study is part of a graduate student’s research project at the University of Minnesota and St. Catherine University. To participate, we ask that you complete a survey, which can be accessed by clicking on the link provided at the bottom of this email. The survey should take no longer than 15 minutes to complete.

A high response rate is important to assure the validity of this study. From survey responses, researchers of this study hope to better understand the attitudes, barriers, and exposure of using different foodservice delivery methods to serve school lunch to students. In addition, understand how foodservice delivery methods used to serve school lunch may impact the overall well being of students. Your participation will also greatly support graduate student learning and research training. Please complete the survey by **January 14th, 2014**. Compensation will be given in the form of an Apple ipad Mini. Each person that completes the survey will be entered into a drawing for the chance to win the Apple ipad Mini. We will be choosing one winner for the Apple ipad Mini. You must complete the entirety of the survey to be entered into the drawing. In addition, to be entered we ask that you leave your name and email upon completion of the survey. This will allow the researchers of the study to contact the winner. The winner will be chosen and contacted via email no later than January 17th, 2014.

Consent information will be provided at the start of the survey. Please read the information. If you have any questions you may contact the researchers at anytime. Contact information can be found below. Please click on the following link to complete the survey:

https://umn.qualtrics.com/SE/?SID=SV_8B8A2qn3L2CFyap

We appreciate your time and help with this project. Thank you very much.

Sincerely,

Jamie Coborn
Master’s Nutrition Student
stree071@umn.edu

Teri L. Burgess Champoux, PhD, RD, LD
Assistant Professor
tlburgesschampoux@stkate.edu

Renee Rosen, PhD, RD
Researcher
rose005@umn.edu