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DOES THE NATIONAL SCHOOL LUNCH PROGRAM FOSTER HEALTHY EATING?

A MIXED METHOD ANALYSIS OF FOOD SELECTION AND CONSUMPTION IN MIDDLE SCHOOL

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DOES THE NATIONAL SCHOOL LUNCH PROGRAM FOSTER HEALTHY EATING?

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BY THE COMMITTEE CONSISTING OF

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Dedication

My dissertation is dedicated to my wife Sydney and my son Isaiah. Isaiah I hope as you grow up you will always chase your dreams and know that you can do anything you put your mind to. I love you and I am so proud of you.

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I first want to thank GOD. Everything I am and everything I do I give to you, Lord. Thank you Jesus for the strength and patience. To you we give all the glory!

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Abstract

American children exhibit the highest rates of obesity among industrialized nations. To promote healthy eating, policy makers have revised standards for the National School Lunch Program (NSLP), which provides free and discounted lunches to nearly 30 million low-income children during the school year. Previous studies report mixed results on the physical health of students participating in the NSLP, but little research examines what students consume when provided a school lunch through the program. In this mixed-methods study, a real-time analysis of the nutritional content of food both selected and consumed during school lunch was performed by taking a random sample of students' lunches (n = 141) over a 3-week period in an urban Title I middle school. Statistical results indicate that selected school lunches are low in nutritional density and high in sugar while food that students ultimately consumed was lower in nutritional value than selected lunches. Following these analyses, 20 interviews with middle school students attending Title 1 middle schools were conducted to develop an understanding of the patterns underlying the statistical results. Grounded in the Social Cognitive Theory (STC), qualitative interviews offered evidence that students pay attention to the appearance and taste of the various food offerings in the cafeteria. Students also seemingly understand what a healthy lunch consists of, but seem to be primarily selecting the lower nutrient-dense foods. Student home selections also do not seem to mirror those of their cafeteria selections. The qualitative findings suggest that cafeterias may be unknowingly contributing to student eating patterns by their presentation of certain foods, the lack of variety offered, along with the lack of autonomy when it comes to students seasoning their own foods. More research is needed to better understand how these variables may contribute to student health outcomes, yet this study begins to better explore how the production of food within school cafeterias may encourage or discourage consumption. This

study contributes to the literature by using an analytical procedure that provides precise estimates of student consumption patterns during school lunch. It also offers in-depth analysis of the factors behind students' meal selection and consumption choices. Future research is needed to understand how effective the NSLP is in its ability to increase nutrient dense food consumption.

Chapter 1: Introduction

Poor physical health in children is a concerning problem in the United States (Pulgarón, 2013; Ward et al., 2017). Over the past 50 years, obesity rates among children and adolescents have skyrocketed by nearly 300% (Hales et al., 2017; Ogden & Caroll, 2010). Among industrialized nations, the United States exhibits the highest rate of obese and overweight children with nearly one-third of American 15-year-olds recently reporting being overweight or obese (OCED, 2017). The consequences of these trends appear severe. Being obese in childhood is associated with lower academic achievement and attainment (Datar et al., 2004; Gurley-Calvez & Higginbotham, 2010), increased likelihood of disease and physical health problems (Pulgarón, 2013; Ward et al., 2017), along with reduced economic productivity in later life (Wolfenstetter & Wenig, 2012). Officials have even argued that childhood obesity represents a major threat to national security (Popkin, 2011).

There seem to be many reasons as to why obesity is on the rise in the United States (Chang & Nayga, 2009; Nielsen & Popkin, 2003; Kassem, 2003; Sallis & Glanz, 2009). Researchers have argued that there is not one factor that describes this rise in obesity for U.S. children; rather, multiple factors are thought to have increased the prevalence of childhood obesity (Rutkow et al., 2016). Some researchers have theorized that decreases in physical activity and increases in sedentary behaviors have caused a rise in childhood obesity (Rutkow et al., 2016). Other factors that seem to increase the prevalence of childhood obesity include the increase of portion sizes, food and beverage companies' marketing "energy-dense foods" at relatively low costs, and the increase of caloric intakes with reduced physical activity (Bleich et al., 2008; Rutkow et al., 2016). These factors, while independent of each other, are all considered factors that have caused childhood obesity to rise. The negative consequences of these factors

may also be fueled by greater technological innovation, which has caused children to remain more sedentary than in previous years (Bleich et al., 2008). As these factors seem to have increased the rate of childhood obesity, it is necessary to determine how these factors may affect children's behavior. Specifically, in the place where children spend most of their waking hours: school (Fletcher et al., 2010). While there are many programs, initiatives, and nuance to a students school day, one program in particular is centered around student eating. That program, which affects over 30 million students daily, is the National School Lunch Program (NSLP; Capograssi & You, 2015; Gundersen et al., 2012; Alfonso et al., 2019).

The NSLP serves as the nation's core, school-based nutrition program (Guthrie, 2020). By serving close to 30 million students each school day, the program costs 14.1 billion dollars annually, amounting to 17% of total federal expenditures on food and nutrition assistance (U.S. Department of Agriculture and Nutrition Services, 2018). To be eligible for a free lunch, a student's household income may be up to 130% of the poverty line, whereas a discounted lunch recipients' household income may be up to 185% of the poverty line (Guthrie, 2020).

When the NSLP was enacted in 1946, the program was primarily focused on alleviating hunger (Hopkins & Gunter, 2015). The program has since evolved, undergoing multiple revisions that have placed a greater emphasis on combating childhood obesity through healthy eating (Hopkins & Gunther, 2015). Meeting the nutritional standards set fourth by the NSLP is required for schools to receive reimbursement from the federal government for free and reduced-price lunches that they provide to students (Joyce et al., 2018). Yet, some have argued that in spite of these changes, federal meal standards for the NSLP remain misaligned with dietician-designed lunches that are considered healthier and more nutrient-dense (Joyce et al., 2018).

One longstanding concern has been that lunches provided through the NSLP do not always provide nutrient-dense options for its participants (Hopkins & Gunther, 2015; Salisbury, 2004). Through the Healthy Hunger Free Kids Act, revisions were made to the NSLP standards which required schools to increase the availability of fruit, vegetables, whole grains, fat-free and low-fat milk while simultaneously reducing sodium, saturated fat, and trans-fat in school lunches (Hopkins & Gunther 2015). However, the effect of these new standards on students' nutritional intakes during school lunches remains unclear and inconclusive as multiple studies have reported mixed results (Alfonso et al., 2019; Capograssi & You, 2015; Gundersen et al., 2012). Several studies analyzing national data find that participation in the NSLP is related to an increased body mass index (BMI) along with an increase of weight gain in students (Capograssi & You, 2015; Hernandez et al., 2010; Millimet et al., 2010; Schanzenbach, 2009). Other researchers reported that students who participate in the NSLP have a reduced BMI for the program participants (Gundersen et al., 2012). While other researchers have found no association with an increase or decrease in BMI due to a students participation in the NSLP (Alfonso et al., 2019; Briefel et al., 2009). A limitation of this mixed literature is that these studies focused solely on the students participation in the NSLP rather than what these students consumed when they received a school lunch.

However, a small body of work exploring food intakes found that NSLP participants may consume more sodium and cholesterol than nonparticipants and that student lunches may be low in nutrients (Campbell et al., 2011; Cohen et al., 2013; Gleason & Suitor, 2003). While these previous studies offer insight into NSLP participants' consumption patterns, authors tended to use self-reports of food eaten over a 24-hour period or before-and-after photos that may have led to imprecise estimates of food consumed by students. Furthermore, existing research largely

investigates student selection patterns prior to changes to NSLP's meal standards under the Healthy Hunger-Free Kids Act (Food and Nutrition Service, USDA, 2010; Gleason & Suitor 2003, Briefel et al., 2009; Schanzenbach, 2009). These gaps in the literature should be addressed since there is evidence that changes to the NSLP nutritional standards may have contributed to improving the quality of school meals (Johnson et al., 2016).

In addition to existing quantitative scholarship, researchers have attempted to gain the students' perspectives on school lunch, specifically surrounding various nutrition intervention programs that exist (Chatterjee et al., 2016; Eustachio et al., 2021). Researchers have also sought to examine the student perspective of school lunches in different countries such as Sweden and Brazil (Kleef et al., 2019; Paiva et al., 2016). Yet few studies have specifically targeted the student perspective of those who actively participate in the NSLP (Pagan et al., 2017). This perspective is needed to better make sense of why students may be making their selection and consumption choices in the cafeteria. Using qualitative interviews to better understand the participant perspective of the NSLP can provide policy makers and researchers insight into the way that participants of this federal program experience the policy daily. This research takes the first step in understanding how students experience the NSLP and seeks to provide insight into a gap that currently exists within the NSLP literature, which is the perceptive of the participant, the student.

To summarize, there are key gaps in the body of literature surrounding the NSLP that currently exist. First, research has been inconclusive on how the implementation of the NSLP has effected student nutritional intake with different studies finding divergent outcomes for students (Capograssi & You, 2015; Hernandez et al., 2010; Millimet et al., 2010; Schanzenbach, 2009; Alfonso et al., 2019; Briefel et al., 2009; Alfonso et al., 2019; Capograssi & You, 2015;

Gundersen et al., 2012). While much of the current research centered on the NSLP focuses on student food selection as opposed to what students consume at lunch. Second, few studies have attempted to gain the perspective of the students who participate in the NSLP daily.

Purpose of the Study

This dissertation uses a mixed-methods approach to examine the question of whether the NSLP is fostering healthy eating for students. While current research remains inconclusive on whether the NSLP fosters healthy eating, the approach that previous researchers have taken is methodologically limited (Gleason & Suitor, 2003; Smith & Cunningham-Sabo, 2013). This study takes a unique approach to analyzing NSLP participant consumption patterns. Student consumption patterns were analyzed by an innovative, real-time data-collection tool over a 3-week period of time within a Title I, middle school cafeteria. This approach allowed researchers to record what students selected for lunch and used precise estimates to determine what students consumed. This method of data collection addresses a methodological gap in existing research on student consumption patterns as previous studies have relied on self-reporting and before-and-after photos rather than real-time, in-person data collection (Campbell et al., 2011; Cohen et al., 2013; Gleason & Suitor, 2003).

Second, this research utilizes qualitative interviews with students to help discern why students may select and consume various lunch options. This addressees a gap in the literature as few studies have sought to gain student perspective on their consumption habits and experience within the NSLP. This mixed-methods approach addresses two sizeable gaps in current research and offers greater insight into what students are selecting and consuming during their school lunchtime along with providing the student perspective as to why these decisions may be made.

Table one presents the research questions and study designs for this dissertations mixed-methods analysis.

Table 1

Research Questions and Study Design

	Research question	Design
Phase 1	*Quantitative Research question.* Do NSLP participants' consumption patterns during school lunch foster healthy eating?	Real-time analysis of random sample of 141 school lunches
Phase 2	*Qualitative Research question*. How do students experience the National School Lunch Program?	Qualitative: semi-structured interviews with 20 middle school students

Overview of Research Design

Data for the quantitative study was collected using an innovative, real-time data collection tool within a Title I, middle school cafeteria. Data for the qualitative study was collected through interviews with middle school NSLP participants as a way to investigate the consumption patterns observed in the quantitative study as well as to gain perspective on the NSLP as a whole. Few studies, if any, have utilized a mixed methods approach to gain the students experience within the NSLP along with participant selection and consumption data within a cafeteria. This research takes a bold step in addressing these gaps in the current landscape of research (Kleef et al., 2019; Pavia et al., 2016).

This research design is also grounded in Albert Bandura's Social Cognitive Theory (SCT). The SCT theorizes that people's choices are based on their previous experience or current environment (Bandura, 2001). Utilizing the SCT to help explain student selection and consumption patterns across cafeteria's can be useful in theorizing why students may have made the selection and consumption choices that they did. Utilizing the SCT to hypothesize the

selection and consumption patterns of students helps to provide the lenses to better understanding lunchroom implications, policy shifts, along with potential interventions.

The qualitative interviews with students help to provide some context of the quantitative data that was collected and analyzed prior to the interviews. Using and establishing qualitative interviews with students who participate in the NSLP after collecting quantitative data from NSLP participants during their lunch hour offered valuable perspectives on NSLP outcomes. By specifically procuring questions surrounding the analysis of the quantitative data that was previously collected, the researcher was able to gain a greater perspective of the results. Together, this mixed-method approach to understanding the NSLP offers valuable perspective surrounding two gaps that currently exist in the research: (a) what are students enrolled in the NSLP consuming daily during school lunch, and (b) why do these selection and consumption patterns exist?

Some previous research has specifically targeted student's lunchtime eating habits (Cullen & Watson, 2009; Robson et al., 2000), but little to no research has used this real-time, cafeteria data collection tool to understand the nutritional components that students are consuming during lunch. This research, coupled with qualitative student interviews, allows for a fuller understanding of what students are selecting and consuming during lunch. Using a mixed-methods approach allows for a complete analysis of the NSLP using both quantitative measures and qualitative interviews.

Student selection and consumption data was collected for 3 weeks in a Title I, middle school cafeteria. The research study and design gathered $n = 141$ student lunches and examined what students selected for lunch by precisely noting what food and drink items students selected and ultimately consumed. This data was collected and statistically analyzed to determine what

nutritional content students were not just placing on their trays but also documenting what content from the student's tray they were consuming. The data was then analyzed to determine lunchroom trends as it related to the nutritional content that was being offered, selected, and ultimately consumed.

The qualitative interviews with students took place over a 1-month period in the fall of 2021. These interviews focused on gaining the student perspective around why students select and consume various items during lunch. More specifically, these interviews sought to help explain the quantitative data that had already been established prior to the interviews. The qualitative interviews with students helped to discern the quantitative research results by helping to explain why the various trends or habits seen in the quantitative study may exist. By directly collecting a random sample of students' school lunches (*n = 141*), along with collecting interviews directly from students (*n = 20*), this dissertation takes an innovative approach in better understanding the student experience within the NSLP. Gaining a deeper knowledge of the consumption patterns of students who are enrolled the NSLP may inform the design of healthy eating interventions while also possibly helping to improve the efficacy of a program that represents a considerable investment in the health and wellbeing of low-income children (Guthrie, 2020). Gaining the student lunchroom perspective also provides insight into potential interventions to increase healthy eating among some of the country's most vulnerable middle school students.

This dissertation offers several key contributions to the literature through the utilization of this mixed-methods design. It adds to the current literature on the NSLP by analyzing fine-grained data on not only what students select during their school lunch, but also what those same students consume. It also utilizes qualitative interviews by gaining middle school, NSLP

participant perspectives on their school lunch experience. Overall, this dissertation contributes to the current body of NSLP research by innovatively gaining school level perspective on the intersections among obesity, nutrition, school lunch, student consumption patterns, and socioeconomic status (Fletcher et al., 2010; Heidleberger & Smith, 2015) through the utilization of this mixed methods design.

Chapter 2: Literature Review

This literature review highlights two important gaps in the NSLP research. The first gap is a current lack of literature surrounding student consumption habits in the cafeteria. Few studies have used a real-time, data collection tool to monitor and track student consumption data within a cafeteria setting. This gap in research, coupled with the current body of research centered on the implications of childhood obesity and the importance of food access and attainment for lower income families highlights the importance of this quantitative study.

The second gap in the current body of research surrounding the NSLP is that few studies in the United States have sought to understand the NSLP participant perspective. This dissertation takes an innovative approach by utilizing a mixed-method design to understanding this perspective. This gap within the current landscape of NSLP literature coupled with research surrounding school-based nutrition intervention methods and the effects of socio-economic status on nutrition highlight the importance of this research design. In order to understand the implications that these two gaps in NSLP research hold for student's health outcomes, it is important to be familiar with the National School Lunch Policy as a whole.

Within this chapter, the NSLP in its historical context is broached followed by an in-depth analysis of the policy, especially focusing on the Healthy Hunger Free Kids Act. This context is important for understanding the current literature that surrounds childhood health and obesity, socioeconomic status and nutritional access, current NSLP findings, and nutritional intervention methods used in different school districts. Learning about the NSLP policy and its historical context in tandem with previous NSLP literature helps to inform a greater framework of the current research and policy surrounding the NSLP.

NSLP: Policy Mandates and Guidelines

According to the USDA, the NSLP is a federal program that provides assistance to the meal programs operating in public schools, residential care institutions, along with nonprofits (National School Lunch Program [NSLP] Fact Sheet, 2017). The NSLP provides meals that are nutritionally balanced at low or no cost to school-aged children every school day (NSLP Fact Sheet, 2017). The NSLP, which was established under the Richard B. Russell National School Lunch Act, was signed into law by President Harry Truman in 1946 (NSLP Fact Sheet, 2017; Hopkins & Gunter, 2015). When the act was signed into law the program was intended to combat student hunger and student wellbeing, specifically after WWII (Hopkins & Gunther, 2015). Yet the program has continued to evolve, specifically in 2010 with the passage of the Healthy Hunger-Free Kids Act (Hopkins & Gunther, 2015). This act sought to provide students in the NSLP a more balanced lunch with healthier food options (Hopkins & Gunther, 2015). Since the time of its inception, revisions have been made to the policy with the focus of the program shifting from alleviating student hunger toward providing greater nutritional options to students (NSLP Fact Sheet, 2017; Hopkins & Gunther, 2015).

Understanding the NSLP in its entirety begins with analyzing how the program operates. For every reimbursable meal that is served within NSLP institutions, these institutions are provided cash subsidies and USDA foods (NSLP Fact Sheet, 2017). In order for schools to receive the subsidies the NSLP institutions must offer lunches at a free and reduced price while also meeting the federal meal pattern requirements to all eligible children (NSLP Fact Sheet, 2017). In addition to the subsidies for school lunches, institutions who allow students who participate in approved after-school enrichment or educational activities can also receive reimbursement for the snacks that are served to its students during these programs (NSLP Fact

Sheet, 2017). Schools that participate in the NSLP have federal guidelines that they must meet and are subsequently audited on meeting the standards set forth by the federal government every year to be reimbursed (NSLP Fact Sheet, 2017).

The reimbursement schedule for schools is calculated yearly (NSLP Fact Sheet, 2017). In order for schools to receive an extra six cents for each lunch served, school food authorities must be certified to remain in compliance with the federal meal patterns (NSLP Fact Sheet, 2017). Along with specific cash reimbursements, schools may also receive USDA foods. States are able to select and purchase foods from a list set fourth and purchased by the USDA (NSLP Fact Sheet, 2017).

Along with receiving reimbursements, schools that operate in the NSLP program are also provided training and technical assistance. School nutrition professionals are assigned to help train districts enrolled in the NSLP on preparing and serving nutritious meals that not only meet the program meal pattern requirements but also appeal to children (NSLP Fact Sheet, 2017). Schools also have the ability to access the "Team Nutrition Resource Library" that has web-based resources to help students understand the relationship between diet and health (NSLP Fact Sheet, 2017).

In summary, the NSLP is set to serve students nutritionally balanced meals at low or no cost. NSLP institutions must offer lunches at a free and reduced price while also meeting the federal meal pattern requirements to all eligible children (NSLP Fact Sheet, 2017). Schools that enter the NSLP receive cash and food subsidiaries if they are adhering to the nutritional guidelines set forth by the Federal Government. Through the "Team Nutrition Initiative," the FNS (Food and Nutrition Services) will also provide training and technical assistance to school

nutrition professionals to help them find ways to meet the nutritional requirements that appeal to children (NSLP Fact Sheet, 2017).

Policy: Nutritional Guidelines

The backbone of the NSLP are the nutritional guidelines provided by The Healthy Hunger-Free Kids Act that tightened the nutritional components that schools must adhere to (Hopkins & Gunther, 2015) to receive their food and monetary subsidies (NSLP Fact Sheet, 2017). Since the passage of the Healthy Hunger-Free Kids Act, there have been adjustments, proposals, and new rules that have curtailed the original legislation (Nutrition Standards in the National School Lunch and School Breakfast Programs, 2012). The Healthy Hunger-Free Kids Act was set forth to increase the availability of vegetables, fruits, whole grains, low-fat milk and fat-free milk in the school menu (Nutrition Standards in the National School Lunch and School Breakfast Programs, 2012). The legislation also aimed to reduce the levels of sodium, saturated fat, and trans-fat in school meals while assuring the students meals met the caloric requirements (Nutrition Standards in the National School Lunch and School Breakfast Programs, 2012). The overall purpose of the legislation was to provide greater access to nutrient-dense meals across the country by meeting the dietary needs of school-aged children (Nutrition Standards in the National School Lunch and School Breakfast Programs, 2012). The proposed changes were designed for meals offered to school aged children in grades kindergarten to 12th grade and were largely based on the IOM recommendations set forth in the report “School Meals: Building Blocks for Healthy Children” (Nutrition Standards in the National School Lunch and School Breakfast Programs, 2012).

The Healthy Hunger-Free Kids Act legislated and specifically outlined the changes to the NSLP that are in place today. Table 2 lists the changes.

Table 2

National School Lunch Rules, 2012 (Nutrition Standards in the National School Lunch and School Breakfast Programs, 2012)

NSLP Rules (2012)
"Offer fruits and vegetables as two separate meal components."
"Offer fruit daily at breakfast and lunch."
"Offer vegetables daily at lunch, including specific vegetable subgroups weekly (dark green, orange, legumes, and other as defined in the 2005 Dietary Guidelines) and a limited quantity of starchy vegetables throughout the week."
"Offer whole grains: half of the grains would be whole grain-rich upon implementation of the rule and all grains would be whole-grain rich two years post implementation."
"Offer a daily meat/meat alternate at breakfast."
"Offer fluid milk that is fat-free (unflavored and flavored) and low-fat (unflavored only)."
"Offer meals that meet specific calorie ranges for each age/grade group."
"Reduce the sodium content of meals gradually over a 10-year period through two intermediate sodium targets at 2 and 4 years post implementation."
"Prepare meals using food products or ingredients that contain zero grams of trans fat per serving."
"Require students to select a fruit or a vegetable as part of the reimbursable meal."
"Use a single food-based menu planning approach."
"Use narrower age/grade groups for menu planning."
"Conduct a nutritional review of school lunches and breakfasts as part of the administrative review process."
"Determine compliance with the meal patterns and dietary specifications based on a review of menu and labor costs for each reimbursable breakfast in FY 2015, when all the requirements will be in place as stated in the proposed rule."

As Table 2 shows, the NSLP standards were set in place to offer students healthier lunch options and as a way to provide and create equitable lunch options for students across the country (Food and Nutrition Service, 2010). Yet, there have been changes and modifications to the requirements since 2010. In the most recent adjustments, the Trump Administration rolled back some of the guidelines that the Obama Administration had put in place in 2012 (U.S. Department of Agriculture, 2018a). The new modifications to the rule are listed in Table 3.

Table 3

2012–2020 Regulation Shifts

Regulations implemented for the 2012 NSLP and School Breakfast Program	Final Rule for the 2019/2020 School Year based on the Regulations implemented in 2012 for the NSLP and NSBP
Milk – Schools are only allowed to offer flavoring in fat-free milk in school meals	**Milk –** Schools are able to offer flavored low-fat milk in school meals. Also, schools are required to offer unflavored milk at each school meal service
Whole Grains – All grains offered in both programs are to be whole grain-rich	**Whole Grains** – Half of the weekly grains in the NSLP and SBP must be whole grain-rich, the remaining weekly grains must be enriched.
Sodium – Schools must reduce the sodium content over a 10-year period ending school year 2022-2023	**Sodium –** Sodium target 1 will remain in place through the SY 2023-2024. Target 2 is moved to SY 2024-2025 and the final target is removed.

Source: U.S. Department of Agriculture (2018a).

As shown above, the nutritional guidelines were set out to provide schools the framework to provide healthy, nutritious, and equitable meals across the country. The program is rooted in the idea that if students have the opportunity to eat healthier foods at school, more equitable health outcomes may be achieved across all school sites. As explained in the introduction, there is a health crisis in America when it comes to obesity, food insecurity and chronic health issues (Ogden & Caroll, 2010; Gurley-Calvez & Higginbotham, 2010; Ward et al., 2017). The NSLP, even with some of the loosened nutritional guidelines, has been reconfigured most recently to

help provide students who are eligible for free and reduced lunch greater access to more nutrient-dense foods (Hopkins & Gunther, 2015).

Childhood Obesity

The NSLP has been revised through the Healthy Hunger Free Kids Act to offer more nutrient dense food options to all students across the United States with the hope of bettering health outcomes (Food and Nutrition Service, 2010). Childhood obesity affects almost all walks of life and many aspects of society. The percentage of children and adolescents affected by obesity in the United States has tripled since the 1970s (Centers for Disease and Control, 2021). This alarming statistic becomes ever more shocking when recognizing that 1 in 5 school-aged children from 6–19 years old in the United States are obese (Centers for Disease and Control, 2021). With more and more children in the United States becoming overweight and obese, there is an urgent need to understand why this trend has increased so dramatically and what possible interventions exist.

One factor that has shown to increase the prevalence of childhood obesity is environmental influence (Courtemanche, 2000). Many studies have linked household conditions to childhood obesity (Anderson et al., 2003; Guarnizo-Herreno et al., 2012; McIntosh et al., 2006). Time spent between children and their parents appears to be a significant contributing factor (McIntosh et al., 2006). In families with two working parents, children appear more likely to consume snacks, soft drinks, and less healthy restaurant meals (Anderson et al., 2003). Homemade meals tend to have less saturated fat and added sugar and have been found to contain more fresh fruit and vegetables than restaurant meals (Ayala et al., 2008). As a result, some researchers have asserted that the steady increase in double-income families over the past several decades is associated with obesity and poor nutritional health in children (Anderson, 2003;

Courtemanche, 2009). The association between parents' BMI (Body Mass Index) and children's BMI has been shown to grow stronger over time, providing further evidence that environmental factors may have a role in explaining the dietary health of children (Anderson et al., 2007).

Socioeconomic status also seems to be an important factor in relation to childhood obesity rates. Singh et al. (2007) analyzed 46,707 children and found that 16.4% of U.S. children were obese, and 31.6% of U.S. children were overweight. These authors analyzed survey data from 2003–2007 and saw that obesity prevalence increased by 10% for children in low-education, low-income, and higher unemployed households (Singh et al., 2007). While obesity is multi-factorial, socially and economically disadvantaged groups may be more vulnerable to higher obesity rates (Singh et al., 2007). Obesity rates rise faster in low-income populations (Lockyer & Spiro, 2019). Indeed, children from low-income and low-education households had 3.4–4.3 times the odds of being obese than children from higher socioeconomic households (Singh et al., 2007). This makes the push to develop better health outcomes for economically disadvantaged groups essential.

Various ethnicities may also have a higher risk of obesity prevalence as well. Singh et al. (2007) found that Hispanic, non-Hispanic White, and American Indian children had a 3.0–3.8 times higher odds of being obese or overweight than Asian children. A higher obesity prevalence than all other ethnic groups has been seen among African American children, Mexican American children, and Native American children (Singh et al., 2007).

Broader sociocultural norms in the United States have been highlighted in research on childhood obesity as well. High-calorie snacks and soft drinks are readily available to youth at a relatively low prices (Chang & Nayga, 2009). Fast food comprises the highest percentage of food consumed for youth when outside of their homes, while portion sizes for fast food and high-

calorie snacks have increased substantially (Chang & Nayga, 2009; Nielsen & Popkin, 2003). Analyses have further demonstrated that American youth today consume a larger percentage of low-nutrient foods with higher saturated fat, trans fats, cholesterol, and added sugar than that of previous generations (Marks, 2015).

Ward et al. (2017) predicted that "given the current level of childhood obesity" a majority of today's children (57.3%) will be obese by the age of 35 years old, and "roughly half of the projected prevalence will occur during childhood" (p.2145). The authors suggest a positive correlation that severe obesity in early childhood can lead to a greater likelihood of adulthood obesity as well. As researchers better understand the obesity epidemic, it is imperative that institutions find ways to combat this issue.

One way public schools can work to stop the prevalence of childhood obesity is by providing less processed, greater nutrient-dense food for students during breakfast and lunch. A healthy diet during childhood was also linked to positive physical development (Edwards & Cheeley, 2016), cognitive functioning (DiGirolamo et al., 2020), and behavioral outcomes (Lozoff, 1989). However, trends suggest that poor diets and nutrition are major problems in the United States. In 1970, only 5% of children and adolescents were obese, but since that time, the rate of children and adolescents described as obese has dramatically risen to approximately 19% (Anderson et al., 2019). Nearly one-third of American children 2–19 years of age are overweight or obese (Ogden & Caroll, 2010).

Childhood obesity rates also vary across subgroups. For instance, boys are more likely to be obese than girls (Govindan et al., 2013). The obesity rate among those aged 2–19 is 19% for low-income youth and 20% for middle-income youth but plummets to 11% for youth of upper-income backgrounds (Ogden & Caroll, 2018). Across racial groups, Asians reported the lowest

rate of obesity at 11%, whereas while White (14%), Black (22%), and Hispanic (26%) youth recorded higher rates of obesity (Ogden & Caroll, 2018).

If interventions are not curated and the current childhood obesity trends continue so will chronic health conditions. The chronic health conditions that childhood obesity can lead to include but are not limited to “cardiovascular disease, insulin resistance, musculoskeletal disorders, and some cancers” (World Health Organization, 2021, p.3). To curtail these conditions, the World Health Organization (WHO) suggests that school-aged children and adolescents should "limit energy intake from total fats and sugars, increase consumption of fruits and vegetables, as well as legumes, whole grains and nuts while also engaging in [60 minutes a day] of physical activity daily” (World Health Organization, 2021. p.5). These recommendations are similar to the NSLP’s nutritional standards shift in 2010 through the adoption of the Healthy Hunger-Free Kids Act.

Being overweight or obese in childhood also seems to increase the risk of coronary heart disease (CHD) in adulthood (Ludwig, 2007). If the current obesity rates remain the same, it is predicted that the prevalence of CHD will increase from 5% to 16% by 2035 “with more than 100,000 excess cases attributed to increased obesity among today’s adolescents” (Ludwig, 2017, p.2325). Similarly, Cote et al., (2013) found that obese children are predisposed to an increased risk of cardiovascular morbidity and mortality in adulthood and may exhibit early signs of cardiovascular dysfunction as a result of their excess “adiposity.” “Compelling evidence” suggests that cardiovascular damage which was once only observed in adults is also occurring in obese children (Cote et al., 2013, p.1310).

Scholars have offered numerous theoretical explanations for the high prevalence of childhood obesity in the United States (Lang & Rayner, 2007; Lerma-Cabrera et al., 2015;

McFerran & Mukhopadhyay, 2013; Sallis & Glanz, 2009), such as genetic factors including metabolic defects or fat cell counts (Sallis & Glanz, 2009). Yet other scholars have argued that genetic factors fail to explain rapidly rising rates of obesity, theorizing that environmental norms and individual behaviors are the primary driving mechanisms behind the growing childhood obesity rates (Kassem, 2003; Sallis & Glanz, 2009). Empirical analyses have identified a combination of genetic, behavioral, and environmental influences on obesity, although the literature was inconclusive on which specific factors are most salient (Gurnani et al., 2015). Among studies focused on a genetic predisposition to obesity, Loos and Bouchard (2003) examined twins adopted into different families and found a link between heritable genes and predisposition to obesity. Individual behavioral characteristics, such as self-regulation and the ability to delay gratification, also appear to be closely connected to childhood obesity (Franci & Susman, 2009; Kassem, 2003; Tan & Holub, 2011). Lack of self-control, sedentary behavior, technology addiction, and low physical activity in individuals also show strong relationships between obesity and poor physical health in youth (Turel et al., 2016).

Socioeconomic Status and Childhood Nutrition

In the United States, 15 million children, (21% of all U.S. children) live in families with incomes below the federal poverty threshold, a measurement that has been shown to underestimate the needs of families (Gundersen & Ziliak, 2015). Researchers noted that families living in poverty who face food insecurity also face food inadequacies and diet changes that persist over long periods of time (Gundersen & Ziliak, 2015), including skipping meals, reducing portion sizes, and an increased consumption of energy-dense foods (Estreet et al., 2018). Not only do people who live with food insecurity or food inadequacies face prolonged diet changes, but they also have a higher likelihood of consuming foods with higher levels of sugars, trans-

fat/saturated fats, and refined grains (Estreet et al., 2018). These factors have negative mental and physical health outcomes for people living in poverty (Estreet et al., 2018).

Socioeconomic status also affects students' nutrition at home (Gundersen & Ziliak, 2015). There is a "direct correlation" between food insecurity in households and a decreased intake of vegetables among children (Landry, et. al, 2020). This is similar to Caspi et al. (2012) research which observed that residents in the in the greater Boston area that were classified under a "low-income status" also had low fruit and vegetable consumption. Knowing that students from low-income households may not eat as many fruits and vegetables as their peers while they are home highlights the need for the NSLP to ensure that students have access to, and consume, their fruit and vegetable options while at school.

Research has also suggested that students from low-income communities typically eat an unhealthy diet. Researchers have noted that children in low-income households consume a high frequency of high-calorie, low-nutrient-dense foods, which may contribute to weight gain (Heidelberger & Smith 2015). This is similar to the Leung et al. (2012) research, which observed the dietary intake and dietary quality of low-income adults in the Supplemental Nutrition Assistance Program (SNAP) and found that few low-income adults consumed the recommended amounts of whole grains, fruit, vegetables, nuts, seeds, and legumes. The researchers also found that many low-income adults exceed recommended limits for processed meats, sweets, bakery deserts, and sugary beverages (Leung et al., 2012).

Moreover, researchers have noted that low-income families do not just make dietary decisions based upon their personal preferences but also based upon the food options that are within close proximity (Wiig & Smith, 2009). Wiig and Smith found that participants' food choices and grocery shopping behavior were shaped by both individual and family preferences

along with the economic and environmental situation. The researchers noted that during their focus groups, low-income women stated that the store location was a deciding factor for their shopping choices as most women in the study did not have a car. Most female participants shopped with food stamps and "limited their shopping to food stamp vendors such as larger retail grocery stores" (p.1728). Wiig and Smith suggested that store accessibility, food prices, and food stamp policies were major factors that affected their shopping decisions with most women in this study feeling as though they could not purchase their "ideal diet" (Wigg & Smith, 2009).

School-Based Nutrition Interventions

With U.S. childhood obesity rates increasing, it is also important to understand what kind of interventions are currently being utilized within schools to combat this ever-growing issue. Different school-based intervention programs have been studied, and the results have commonly shown to not influence weight change (Ezendam et al., 2012; Cunah et al., 2013; Klesges, et al., 2010; Sgambato et al., 2019;). While school based intervention programs have not shown to make a difference in combating student weight, schools are common intervention locations for increasing fruit and vegetable consumption (Ganann et al., 2012). Yet few, if any studies, have taken the approach of creating an intervention centered on the items served to NSLP participants.

One intervention program attempted to increase fruit and vegetable consumption through the cafeteria with the intention of helping to prevent diabetes (Mobley et al., 2012). This intervention program implemented changes to the a la cart items available in the cafeteria to reduce fat content, lower the dessert/snack food serving size, and eliminate higher fat milk and added sugar beverages while increasing the prevalence of fruit and vegetables (Mobley et al., 2012). Through this three-year intervention program researchers noted that students consumed more nutrient-dense foods. Yet, researchers did not find any specific changes to the participants

BMI in either the intervention or control schools (Mobley et al., 2012). The authors concluded that there needs to be a focus on a multi-pronged approach at obesity prevention and intervention rather than a single intervention effort (Mobley et al., 2012).

Another school-based intervention program took place in Los Angeles Unified School District (Bogart et al., 2016). This intervention targeted five schools and tested a five-week school-wide obesity intervention program. This program combined nutritional changes such as a variety of sliced/bite-sized food and freely available "chilled filtered water" at lunch along with a variety of health promotion, physical activity, and nutritional support groups (Bogart et al., 2016). The authors found that through this multi-pronged approach, brief school-based interventions can impart skills for behavior change that have long-term consequences (Bogart et al., 2016).

Another intervention program that aimed at increasing the consumption of fruits and vegetables along with dairy products took place in Canada and was titled "Team Nutriathlon" (Drapeau et al., 2016). Researchers developed an eight-week school based intervention program that targeted students through a health promotion design in which students in fifth and sixth grade were engaged in a course that aimed at modifying their eating habits. This eight-week course was taught in partnership with a health and fitness course titled "Team Pentathalon" (Drapeau et al., 2016). Researchers found that students who participated in the "Team Nutriathlon and Team Pentathalon" consumed 3.1 more servings a day of fruits and vegetables and 2.0 more servings per day of dairy products than those that did not participate in the program (Drapeau et al., 2016). While results indicate that this type of intensive eight-week intervention was successful, researchers have attributed some of the success to the motivational component of the program in which students earned symbolic prizes for achievement for their increased

consumption of fruits and vegetables and dairy products (Drapeau et al., 2016). The reward component of this intervention method may point to how, utilizing the Social Cognitive Theory to specifically target behaviors that increase fruit and vegetable consumption can be an intervention design to be explored by policy makers and researchers.

While schools have been sites for various obesity intervention methods and measures, research has shown that few have an effect on student weight (Ezendam et al., 2012; Cunahet al., 2013; Klesges et al., 2010; Sgambato et al., 2019). Yet, through meta-analysis and systemic review of literature centered on school/family based nutrition intervention methods researchers have found that if the intervention measures are well established and designed that nutrition intervention methods can increase fruit and vegetable consumption (Black et al., 2017). Researchers found that the most effective intervention methods incorporated role models including peers, teachers and historic figures (Black et al., 2017). The successful intervention methods not only increased access to healthy foods but also used rewards as well (Black et al., 2017). Along with these factors, the literature also suggests that school sites need to take a multi-pronged approach to fully combat obesity, as one sole intervention method will not procure the results needed to fully combat childhood weight gain (Mobley et al., 2012). The research surrounding successful intervention methods suggests that peers, rewards and a multi-pronged approach to increasing student fruit and vegetable consumption is needed for successful implementation. This is aligned to Bandura's SCT which suggests similarly, that part of the reason why students may be making the consumption and selection choices in the cafeteria are due to their environment or peer/home influence. Understanding how these variables can aid in the creation of school-based nutrition intervention methods within the NSLP will be important for policy makers and researchers.

Research on the National School Lunch Program: Selection and Consumption

School norms, practices, and programs may offer significant environmental influences on the dietary health of children. Children spend a large share of their waking hours in school, and school policies related to lunch, vending machines, health education, and physical fitness may help to shape children's eating behaviors (Fletcher et al., 2010). Early eating habits seem to be highly relevant as childhood obesity is closely related to obesity in adulthood (Craigie et al., 2011).

Dietary interventions during early years may be far more effective than interventions in adulthood (Campbell et al., 2008). Schools have been a setting for interventions seeking to improve healthy eating and reducing obesity (Gonzalez-Saurez et al., 2009; Gortmaker et al., 1999; Lytle et al., 2004). Although the positive effects of these interventions are modest, Gonzalez et al. (2009) found that consistent intervention seems to be more effective than short-term efforts. Other researchers have noted that "existing evidence is most favorable for a combination of interventions, such as diet and exercise in obesity prevention [along with] diet, exercise, and behavioral therapy for obesity management" (Salam et al., 2020, p.19). In reviews of the literature on school-based interventions, cafeteria menu changes and alterations to water fountains are associated with small positive reductions in body weight whereas health education has tended to exhibit no effects on students' physical health (Kerr et al., 2019).

Campbell et al. (2011) noted that their data first suggested students did consume more key nutrients if they participated in the NSLP. Yet the authors went on to note that an increased examination of their data indicated that the increased nutrients that students were consuming may not have come from increased nutritional quality of the food; rather, students increased the quantity of food they consumed during lunch. Campbell et al. explained that students

participating in NSLP consumed “approximately 137-140 grams more food than their nonparticipating counterparts” (p.1116). Moreover, their results indicated that the cause of increased obesity levels in students participating in the NSLP could be due to higher food consumption levels. These researchers theorized that “NSLP participants tend to consume the same nutritional quality lunch meal as nonparticipants but just in larger quantities” (p.1118).

Regarding the importance of menu offerings, Joyce et al. (2018) found the difference between a “best practice menu” and a “typical school lunch menu.” They created a “best practice menu” by creating a menu that took into account seasonal offerings and which recipes were possible (p.638). The best practices menu was created to meet the lowest sodium requirement of 710 mg/lunch, and it had minimally processed foods such as fish/vegetarian meals as well as food that had a multitude of colors of fruits and vegetables (Joyce et al., 2018).

Joyce et al. (2018) found that using the best practice (BMP) menu rather than a typical (school) menu brought about some very stark differences for a single public school district's menu offerings (see Table 4).

Table 4

Typical Menu vs. Best Practice Menu

Nutrient	Best Practices Menu	Typical Menu	Difference	NSLP
Calories	637.6	733.7	96.1	600–700
Protein (g)	35.6	29.6	-6.1	9–10 oz. per week
Carbohydrate (g)	87.4	76.6	-10.9	8–10 oz. per week
Saturated fat (g)	6.6	9.5	2.9	6.7–7.8 g
Sodium (mg)	562.8	1030.5	467.8	< 1420

Source**:** (Joyce et al., 2018)

Table 4 demonstrates that a typical menu has more calories, carbohydrates, saturated fats, and sodium then the best practices menu. While this research has some limitations, specifically the school's abilities to produce the food on the best practice's menu daily, various differences exist between the best practice menu and a typical menu offered by a school who participates in the NSLP. This study highlights a difference that can be seen when a policy as big as the NSLP is introduced countrywide (Joyce et al., 2018).

Gleason and Suitor (2003) found that students who participate in the NSLP have a greater "mean lunchtime and 24-hour intakes of sodium and cholesterol than nonparticipants" (p.1055). The Gleason and Suitor research along with the Campbell et al research did their work before the new NSLP standards were implemented, yet there has been little research done on food consumption since the new nutritional standards have been revised. Both studies demonstrate that students participating in the NSLP (before the policy change in 2012) may have been eating more grams of food while also having a higher 24-hour intake of sodium and cholesterol.

Researchers have also found that students who participate in the NSLP may not be selecting or consuming an appropriate amount of fruit or vegetables (Smith & Cunningham-Sabo, 2013). Smith and Cunningham-Sabo analyzed 899 lunch trays and used a pre-post photography system to analyze what students selected versus what they consumed. After taking the post-consumption picture, the authors took 20% of the post-consumption student trays and weighed them to compare the weight to the post-consumption tray to determine observer reliability. Smith and Cunningham-Sabo found that middle school students were not regularly selecting fruit and vegetables for school lunch and that 75% of all students chose a fruit item with only 40% of students seen to be consuming the fruit item. Similarly, Smith and

Cunningham-Sabo found that less than 40% of middle and elementary aged students chose a vegetable, with more than 30% going uneaten (Smith & Cunningham-Sabo, 2013).

In regards to how the NSLP affects a student's BMI, Hernandez et al. (2010) looked at a longitudinal data sample from low-income U.S. children who entered kindergarten in 1998 and eighth grade in 2007. These researchers found that "low-income girls who participated in the NSLP displayed a faster rate of change in their BMI over time compared with low-income girls who did not participate in the NSLP" (Hernandez et al., 2010 p.352). The authors found no statistical significance for boys who participated in the NSLP and those who did not (Hernandez et al., 2010). This study, however, was inconsistent with research done by Capogrossi and You (2015), who found that "those students entering the NSLP in fifth grade have a statistically significant increased probability of being overweight [regardless of their gender]" (p.990). Capogrossi and You also found that "students entering both programs in 8th grade have a statistically significant increased probability of being overweight and a decreased probability of being a healthy weight" (p.990). It appears that there may be some type of relationship between meal program participation and child weight based upon various "time-invariant" characteristics.

As the literature suggests that there may be a statistical significance between students BMI and their participation in the NSLP, it becomes ever more urgent to make sure that the nutritional standards set by the federal government are meeting the needs of students. With studies as recent as 2017 suggesting that severely obese children have a higher chance of ending up severely obese adults and with 57% of children projected to be obese by the time they are 35 years old, better understanding what students are consuming during the school day is imperative (Ward et al., 2017).

Summary

With childhood obesity rates on the rise, the literature suggests that if children's health and wellness are not addressed early, there is a greater risk of negative health effects later in life (Ludwig, 2007). This adds an increased importance to understanding the food being served to students in U.S. lunchrooms specifically as it relates to the students health and body mass index (BMI) (Hernandez et al., 2010). Research has shown that regardless of household socioeconomic status, children attending public schools have higher BMI than those attending private schools (Li & Hooker, 2010). Furthermore, students' eligibility for free or reduced-cost lunch or breakfast programs at public schools is "positively correlated with children's BMI" (Li & Hooker, 2010, p.96). These findings highlight the relationship that can be seen between a students overall health and the food that is being served and ultimately consumed in schools across the country.

There has also been research centered on the NSLP and what is offered to and ultimately consumed by students. Students in the NSLP may not be selecting or consuming the amount of fruits and vegetables set forth by the Healthy Hunger-Free Kids Act (Smith & Cunningham-Sabo, 2013). NSLP students may also be consuming a higher amount of sodium and cholesterol than non-NSLP participants (Gleason & Suitor, 2003). Also, a typical lunch menu provided to students may differ in nutrient density from a best practice menu as it relates to the Healthy Hunger-Free Kids Act requirements (Joyce et al, 2018). Finally, low-income NSLP girls may display a faster rate of change in their BMI over time compared with low-income non-NSLP girls (Hernandez et al, 2010).

These results are highlighted by the nutritional realities many low-income students face at home. Families living in poverty have diet changes that persist over a long period of time and

have a higher likelihood of consuming foods with higher levels of sugars, trans-fats, saturated fats, and refined grains (Estreet et al., 2018). Consequently, families from poverty have lower fruit and vegetable consumption (Gutzman & Goss, 2012). Finally, families from poverty may not be able to purchase the foods that they believe would be in an "ideal diet" due to various constraints (Wiig & Smith, 2009).

While intervention efforts have been tried, few have targeted the NSLP as the control group. Yet, various school-based intervention programs have been studied and have commonly not shown to have an effect on weight change (Sgambato et al., 2019; Klesges, Obarzanek et al., 2010; Ezendam, Brug, Oenema, 2012; Cunah, Souza, Pereira, Sichieri 2013), intervention methods have been seen to increase fruit and vegetable consumption (Black, et al., 2017). Successful intervention methods have included using role models and rewards, yet these studies have not targeted the NSLP as the method of intervention (Black, et al, 2017). Intervention methods that have, in some ways, targeted the NSLP such as the Mobley et al. study have noted in their research that there needs to be a focus on a multi-pronged approach to obesity prevention and intervention rather than a single intervention. Lastly, the Borgart et al. 2016 study found that brief interventions can impart skills for behavior change that have long-term consequences (Bogart et al, 2016).

Based on the current body of research this dissertation helps to enhance the understanding of how students experience the NSLP. By using a real-time, innovative data analysis tool to measure lunch selection and consumption, followed by student interviews, this mixed method approach provides a new pathway to understanding the NSLP experience. While utilizing previous literature to help inform the study design and implementation, the results of this research help to address the gaps that currently exist within the research. These gaps, more

specifically, are the current lack of data surrounding on the student perspective within the NSLP along with the lack of data that currently exists surrounding the difference between students' selection and consumption patterns across school cafeterias.

Chapter 3: Theoretical Framework

To inform the qualitative and quantitative analyses, this study primarily draws on concepts from social cognitive theory (SCT), an interpersonal theory founded and developed by Albert Bandura in 1986 (Health Behavior and Health Education, n.d.). This theory is grounded in a construct called "reciprocal determinism," which suggests that personal factors, environmental factors, and behavior continuously interact through influencing and being influenced by each other (Bandura, 2001). The SCT explains that there are multiple ways to change behavior by targeting knowledge and attitudes and changing the environment accordingly (Bandura, 2001).

The SCT is a theory founded to explain how people develop behavioral and cognitive competencies along with how people are able to regulate and manage their behavior in everyday life (Mark et al., 2011). The ways in which people regulate, manage or learn behavior is by experiencing the effects of their own actions. This can also happen through observations of social modeling of peers, role models, or others (Mark et al., 2011). Bandura explains that one of the antitheses for the creation of the SCT is that humans have evolved an advanced capacity for observational learning. Bandura explains that humans have found that directly experiencing an event or an action can not only be a "tedious process" due to trial and error but can also be a hazardous process due to situations being potentially costly, injurious, constraints of time, resources, and mobility (Mark et al., 2011). Thus, humans developed a greater capacity to learn through observations, which the SCT seeks to explain.

Bandura (2001) explained the SCT as a person's ability to distinguish between three different modes of agency (Bandura, 2001). These modes of agency are direct personal agency, proxy agency and collective agency. Direct personal agency is a person's direct action (Bandura, 2001). Proxy agency is when others act on one's behalf to secure a desired outcome (Bandura,

2001). Collective agency is agency that issued through socially coordinated and interdependent efforts (Bandura, 2001). The way in which people use their direct, proxy, and collective agency can be influenced by personal factors, environmental factors, or a mix of both which is a foundational piece to the SCT. Researchers have used the SCT as an intervention method to understand how environmental factors, personal factors and a mix of both can encourage or dissuade behavior. One area in which the SCT has been observed within research is in relation to health promotion and nutritional intervention programs.

For example, researchers used the SCT to determine the effects of the *Youth Fit 4 Life* physical activity/nutrition protocol in 12-year-old participants in a YMCA-based after-school program (Annesi et al., 2017). Researchers used the SCT to help formulate an intervention program that hoped to enhance the self-management/self-regulatory skills of students to support healthy behaviors. Within the *Youth Fit 4 Life* after-school, obesity intervention program, the intervention emphasized the importance of developing self-regulatory and self-management skills (Anessi et al., 2017). Implementing this 12-week after-school, care-based intervention program, researchers found that the program supported changes in self-regulatory skills usage, mood and self-efficacy, which "were all consistent with social cognitive theory" (Anessi et al., 2017 pg. 372). This finding helps to support the value of using the SCT in informing intervention methods.

Another study which utilized the SCT developed a nutrition intervention program targeted at increasing the student's fruit and vegetable consumption (Saha et al., 2020). Researchers utilized the SCT by creating 25-minute nutrition classes, cooking and tasting sessions along with fruit and vegetable handouts about nutritional facts (Saha et al., 2020). Researchers found that participants of the intervention programs showed significant

improvements in nutrition knowledge, fruit and vegetable preferences along with cooking and eating self-efficacy (Saha et al., 2020). This study also suggests that using the Social Cognitive Theory to drive health and nutrition intervention methods can be successful in the development of student's knowledge and agency.

Another study utilized the SCT by helping to inform and develop an educational model regarding food safety and nutrition (Jeong et al., 2016). Highlighting the importance that the SCT plays into student choice and nutritional intake, researchers took aim at developing education materials such as textbooks, teacher guidebooks and school posters centered on food safety and nutrition. The researchers developed a curriculum that covered six themes; caffeine, food additives, foodborne illness, nutrition and meal planning, obesity and eating disorders, and nutritional labeling (Jeong et al., 2016). Researchers found that using these themes grounded in the SCT, that this program model "could serve as a guide" to developing educational materials for nutrition related subjects in curriculum (Jeong et al., 2016 pg. 248).

Researchers have also utilized the SCT to help drive intervention methodology specifically through the lens of health promotion. While this research is centered on NSLP participant selection and consumption patterns in the cafeteria, the SCT, specifically through the lens of health promotion can help to explain why people may make the health choices that they do. Eating and drinking have a direct effect on organisms' health. Using SCT to ground this work through the lens of health promotion is also advantageous to this research as this theory can help the reader better understand the potential intervention methods that may exist.

One of the large-scale applications of the SCT centers on the application of the theory on health promotion and disease prevention which provides a "wide reach and high effectiveness" (Mark et al., 2011). Bandura (2004) described the core components of SCT that affect health

promotion in five "core determinants." The first core determinant is the knowledge of health risks and benefits of different health practices (SCT health promotion). The next core determinant is the perceived self-efficacy that one has over one's own health and their choices. The next core determinant is outcome expectations, which is the expected costs/benefits of different health strategies (Bandura, 2004). The next core determinant is the health goals that people set for themselves followed by the perceived facilitators of the social and structural impediments to the changes that they seek. Finally, the fifth core determinant is the perceived facilitators and the social and structural impediments to the changes that they seek (Bandura, 2004).

Inherently, whenever a person is to select to consume something, they are making a health choice and choosing how to keep their body alive. Bandura (2004) explained that the knowledge of health risks and benefits create a "precondition" for change. Students may or may not understand how what they are eating affects their health. Bandura explained that if a person does not understand how their choices affect their health, the person will not "put themselves through the travail of changing the detrimental habits they enjoy" (Bandura, 2004 p.144). Bandura explained that through the lens of the SCT, in relation to health promotion, that self-efficacy is important and that whatever serves to motivate or guide behavior is "rooted" in the person's belief of their own self-efficacy (Bandura, 2004).

Bandura (2004) also explained that health behavior is also based on "outcome expectations," which can take many forms. People will make health decisions based on the outcomes that they perceive the decision will create. This is what creates a person's self-evaluative reaction (Bandura, 2004). People will make health decisions based on what the decisions will give them, specifically self-satisfaction and self-worth. However, people will

refrain from behaviors that breed self-dissatisfaction (Bandura, 2004). As research has shown, students from poverty may be used to eating an unhealthy diet of higher processed foods (Bandura, 2004). Yet if through the students' personal self-evaluation reaction, consuming these types of foods did not breed self-dissatisfaction, then the student might continue this behavior.

Rooting this study in SCT and using a specific lens of health behavior and promotion may help to explain why some students are making the selection and consumption choices that they are. Utilizing the SCT within this study can also help to better describe how a student's school environment, behavior, and cognition inform student decision-making through reciprocal determinism. Again, while this study takes an innovative, mixed-methods approach to explain student eating habits within the NSLP, other studies have used SCT as a theoretical framework to also explain eating habits (Jeong et al., 2016, Saha et al., 2020, Annesi et al., 2017).

The current study is also grounded in the SCT because research has shown that there are considerable factors including personal factors, environmental factors, and behavior factors that influence students' food choices and intake (Heidelberger & Smith, 2015). Rooting this study in the SCT can help to explain why students may have selected the food that they chose in the cafeteria. Within the qualitative study of this research, better understanding the student perspective was important as the SCT suggests that students may be more likely to select foods that they have eaten before (Lubans et al., 2012). Additionally, the SCT suggests that student food selection may mirror that of their food selection at home (Lubans et al., 2012). As noted previously, to be eligible for free lunch, a student's household income may be up to 130% of the poverty line; reduced price lunch recipients may be up to 185% of the poverty line (U.S. Department of Agriculture and Nutrition Services, 2018). Because students who are enrolled in the NSLP are more than likely living in poverty, these students may have different eating habits

from their more affluent peers (Wiig & Smith, 2009). This is important to note when analyzing student lunch selection and consumption in school cafeterias.

Being able to better explain what students have consumed in the cafeteria, rooted in the SCT, may help not only explain why these choices are made, but also elucidate potential intervention methods. Knowing that students may gravitate toward the foods they are accustomed to consuming or seeing others consume at home is important to understanding their behavior in the food selection process. The food choices that students make in the cafeteria may not breed the same dissatisfaction that some of these choices may breed for more affluent students due to the difference in eating habits between both sub-groups. Utilizing qualitative interviews to gain the student perspective on how student's food choices at home affect their food choices at school is a key finding in helping to determine interventions and policy implications.

While researchers have utilized the SCT to target intervention methods, specifically surrounding nutritional intake, few studies, if any, have used the SCT as the basis for explaining student lunch consumption patterns in the cafeteria. Grounding this work in the SCT helps to better inform why students may be making their selection and consumption decisions in the cafeteria. Using the SCT to understand selection and consumption choices can help researchers and policy makers develop interventions and policies to encourage healthy eating.

The way the SCT is demonstrated through the lens of student food selection is listed below in Figure 1, which shows a picture of students standing in the cafeteria at the center of the image amid the factors of the SCT: cognition, environment, and behavior (Mark et al., 2011). All three of these factors highlight the ways in which behavior can be influenced, changed and

adjusted (Mark et al., 2011). Figure 1 describes how cognition may change an environment which may, in turn, change behavior.

Figure 1

Social Cognitive Theory Demonstrated by Student Selection in the Cafeteria

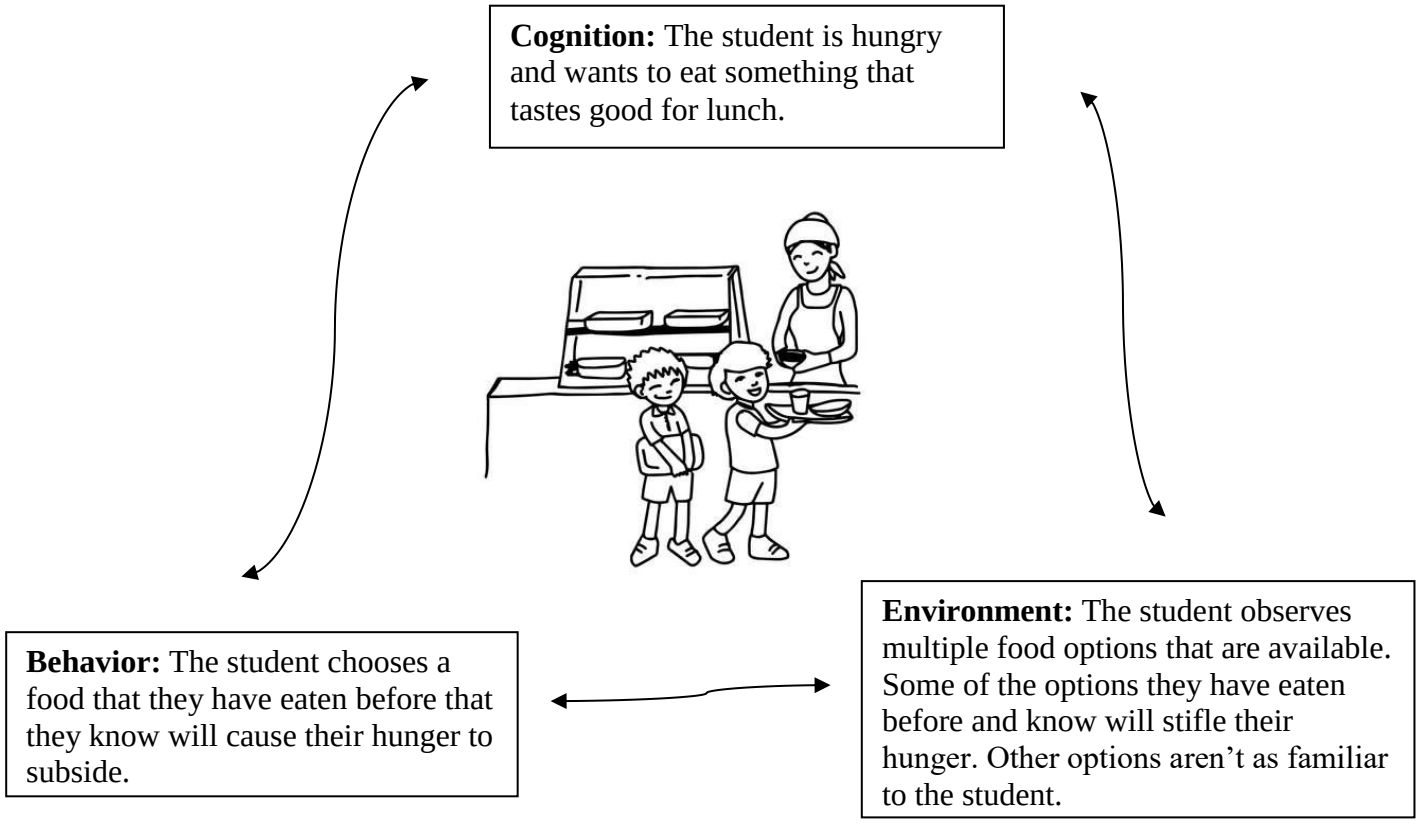

Figure 1 demonstrates how behavior can influence individuals through the lens of the SCT and how the SCT can be expressed in action through a student's lunch experience and environment. One of the foundations of the SCT is that cognition, behavior, and the environment interact to change or influence behavior (Bandura, 2004). Figure 1 explains how a student's

behavior starts with cognition within the cafeteria. This figure begins by describing the student's cognition, the fact that they are hungry. The behavior begins with the student thinking that they are hungry. Yet, how the student responds to that behavior is influenced by their environment, which in this example is the cafeteria line by deciding what the student is going to select to eat to cause their hunger to subside. Finally, the selection of the food influences the student's behavior to consume the food selected that the student knows will cause their hunger to subside. Again, the SCT is a reciprocal theory that highlights that these factors constantly interact with each other to manifest a behavior (Mark et al., 2011). Actions do not always start with just cognition, but rather all three of these factors can begin a behavior and influence others.

For example, if the student in Figure 1 was not particularly hungry but was in the cafeteria because it was their lunchtime. This student enters the lunch line because their table is called, which would describe how their environment, not cognition, would start the behavior. The student is not hungry, but the lunch options are free and available to them, so the student makes a selection based on what they think would taste good and is available, which would describe their cognition. The student then eats the lunch or the items that they want, which describes the student's behavior. The SCT demonstrates how all three aspects of reciprocal determinism interact together to inform behavior.

Utilizing the SCT to explain student lunch choices and consumption patterns within the NSLP suggests that learning is observational thus many of the choices students are making are due to what they observe (Mark et al., 2011). While behavior, cognition, and the environment consistently interact with each other, the student's observations in these three paradigms continue to influence the student's choices and selections. Grounding this study in the SCT can

help better explain why students may be making the consumption and selection decisions that they make in the cafeteria.

Chapter 4: Methods

This study analyzes the NSLP by using a mixed-methods approach to data collection. This research aims to foster a greater understanding about what students consume within the NSLP and why. The process for data collection was as followed. First, the quantitative data was collected in an Oklahoma, Title I, middle school. This data was collected and analyzed to determine what students, who are enrolled in the NSLP, were selecting and consuming in the cafeteria. The qualitative interviews took place after the quantitative data was collected and analyzed to allow for questions and *a priori* codes to be formulated around the quantitative findings. This rationale allowed researchers to use the qualitative interviews with students to better understand the quantitative data that had already been collected. This mixed-methods approach allowed for a comprehensive understanding of selection and consumption patterns of middle school students enrolled in the NSLP. The qualitative study focused on interviews with students (*n = 20*) enrolled in the NSLP and who identified as middle school students (grades 6–8). The quantitative study investigated the nutritional content of food consumed by participants in the NSLP by collecting data from a random sample of sixth-grade students' school lunches (*n = 141*) in an urban, Title I middle school.

Table 5

Research Questions

	Research question	Design
Phase 1	*Quantitative Research question.* Do NSLP participants' consumption patterns during school lunch foster healthy eating?	Real-time analysis of random sample of 141 school lunches
Phase 2	*Qualitative Research question.* How do students experience The NSLP?	Qualitative semi-structured interviews with 20 middle school students

Quantitative Study Phase I

Study Setting

To address the quantitative research question, data was collected in an urban Title I middle school over a 3-week period in the spring of 2020. Initially, this study was to continue for two months, but school closures brought about by COVID-19 necessitated early conclusion of the data-collection phase. Table 6 presents a comparison of the characteristics of the school where the study was performed versus other Title I schools across the country.

Table 6

Comparison of the Study Setting and Other Title I Middle Schools in Large Cities

	Study setting	Title I middle schools[1]
Enrollment	722	625
Sixth-grade	272	184
White (%)	8	12
Black (%)	48	29
Hispanic (%)	28	50
Asian (%)	3	5
Other (%)	21	4
Locale		
Large City (%)	--	16
Total Schools	1	1,539

A. Title I public middle schools located in large cities in Common Core of Data

Title I schools are schools from which 40% of all families are categorized as low-income (Improving Basic Programs Operated by Local Educational Agencies, 2018). It was important for this research to understand selection and consumption habits in Title I schools as previous research has suggested that families from low-income households do not eat as many fruits and vegetables as their more affluent peers (Estreet et al., 2018). Using data from a Title I school allowed a greater access to observing students who come from a low-income households and

thus, allowed a greater frequency of observations of selection and consumption patterns in the cafeteria.

Title I schools also adhere to all prescribed regulatory measures in place by the NSLP. Students observed throughout the quantitative study all were eligible for a free and reduced price lunch. Using this study setting allowed for a complete analysis of student selection and consumption patterns and allowed the researcher to observe multiple students selections not just a select few. Using a Title I middle school as the study setting for the quantitative research question gave opportunities for multiple observations of randomized student selections and provided a sample that may mirror the other 98,456 Title I schools that serve predominantly low-income students that operate in the United States (Table 3. Number of operating public elementary and secondary schools, by school type, charter, magnet, Title I, Title I school wide status, and state or jurisdiction: School year 2015–16, 2017).

Within this school setting, the researcher prioritized data collection from one sixth-grade lunch period. It was important to consistently attend one lunch period for the duration of the lunchtime to accurately measure the selection and consumption patterns. Attending one specific lunch hour also allowed for different lunchtime variables to be controlled such as food offerings, time of the day, size of the lunch, difference in lunch staff, and other unique variables that could occur during each lunch hour. Utilizing one lunch hour and one cohort of students allowed the researcher to control for some of those variables.

Data Collection

To examine nutritional intake for sixth-grade students, approximately 15 school lunches a day were randomly selected from a lunchroom of 90 sixth-grade students during a 3-week period in the early spring of 2020. An outline of the cafeteria assigned each seat and table in the

cafeteria a numeric value. A random number generator was used every morning to select which random seats would be observed each day the research was being conducted. On average, 15 seats were selected daily. If a student was not sitting at a randomly selected seat, an alternate seat would be selected by moving to the right one seat and then left one seat. This process rotated between a move to the right and a move to the left every time a new seat was unattended.

This study used a cautious approach to record nutritional content consumed during school lunch. Before the start of each lunch period, the nutritional content of each menu item offered to students on that day was recorded (not consumed, one-fourth consumed, half consumed, three-fourths consumed, completely consumed). These items included milk, juice, main entrees, and side dishes. An official dietary chart, the School Lunch Measurement Record, was used to determine the nutritional content offered to students for each food item.

At the close of the lunch period, the researcher collected the lunch trays and refuse for each of the 90 students in the cafeteria. This protocol for lunch waste disposal was used because students were accustomed to having an adult dispose of trays and waste at the end of the lunch period. For randomly selected seats, the author made note of each item selected and carefully recorded what was consumed and not consumed by the student (not consumed, one-fourth consumed, half consumed, three-fourths consumed, completely consumed). While disposing of lunch trays, contents in milk and juice containers were checked, and a record of the extent that main entrees and side dishes were eaten was made. Unlike before-and-after photos and 24-hour recalls used in prior analysis, each food item was inspected closely to generate a close estimate of what was actually consumed by each student.

Measures

*S*chool lunch offerings consisted of a main meal, juice, milk, and side options. Nutritional content for the entire school lunch of each student was collected and analyzed. By using the School Lunch Measurement Record, calories, protein, carbohydrates, fiber, sugar, saturated fat, sodium, cholesterol, total fat, vitamin A, vitamin C, iron, and calcium were recorded for each food or drink item selected and consumed by students. The recorded amounts for sugar are more complex than other nutritional items because sugar is consumed in different forms (e.g. sucrose, glucose, fructose), and there is a fair amount of uncertainty about the relative effects of varying forms of sugar on physical health (Morenga et al., 2013). Many school food suppliers also do not distinguish between naturally occurring and added sugar in food items. As a result, total sugar was recorded and compared to WHO-recommended amounts for total sugar for children (World Health Organization, 2015). Within the School Lunch Measurement Record the students gender was also noted.

Analysis

During the analysis, the percentage of different lunch items selected was generated. For each food item that was selected, the percentages of students fully, partially, or not at all consuming the item were analyzed. Subsequently, USDA daily requirements for milk, meat, vegetables, and fruit were recorded and compared to the percentage of students in the sample who consumed any amount of milk, meat, vegetables, and fruit. For the main analysis of nutritional intakes, the total amount of calories, protein, carbohydrates, fiber, sugar, saturated fat, sodium, cholesterol, and total fat in each food item was recorded. The nutritional content of selected food items was then compared to the nutritional content consumed for each food item. To examine the total amount of nutritional content selected and consumed, the nutritional content

was added together across different food items. The total nutritional content selected was subsequently subtracted from the total amount consumed for calories, protein, carbohydrates, fiber, sugar, saturated fat, sodium, cholesterol, and total fat.

Qualitative Phase II

To address the qualitative research question, "How do students experience the NSLP?" twenty middle school students who qualified for the NSLP and who were enrolled in sixth to eighth grade were recruited for semi-structured interviews. These interviews were grounded in the student experience in the NSLP. The questions focused on student eating habits at home and the students' choices in the school cafeteria as a way to interoperate if the students eating habits at home were translating to the school cafeteria. The SCT would suggest that students may be selecting and consuming foods that are closely related to the foods that they are consuming or observing being eaten at home (Bandura, 2001). The researcher sought to understand, through qualitative interviews, what students were eating at home and if there were any positive association to what they are eating in the cafeteria.

The qualitative interviews were also used to help explain the quantitative data that was collected. The researcher in the quantitative study, using a real-time innovative data approach, was able to more accurately capture what nutritional content students were selecting and ultimately consuming during lunch. The researcher found during the quantitative study that 93% of all lunch selections included either pizza, a hamburger/cheeseburger, nachos, or chicken tenders. In addition, only 5% of lunches included consumed vegetables, and only 16% of lunches included consumed fruit. The qualitative interviews with students sought to explain the student perspective of why these results may exist and asked students targeted questions surrounding the

consumption of school lunches to help better explain the differing intake of the more nutrient-dense foods such as the vegetable and fruit options.

Participant Recruitment

Students who participated in the qualitative interviews were recruited through a convenience sample of data, targeting areas where middle school students were in attendance (e.g., afterschool programs, basketball teams). Advertisement for the study was shared across social media, with members of the greater community who interact with many families who qualify for the study, along with local school administrators. Flyers and permission slips were shared with these groups along with the messaging that a $10 Quick Trip Gift Card would be provided for any middle school student who completed the interview. The researcher started by obtaining parental consent from each of the interviewee's guardians as well as being available to connect with the guardians to answer any questions they may have had about the research, the interview questions, and the process. This consent was drafted, created, submitted to, and approved by the IRB of the University of Oklahoma before any of the interviews took place. Once the consent form was signed, the interviews were scheduled to be held over Zoom or in person with the expectation that no identifiable student information was to be posted or used in the study.

The 20 qualitative interviews ($n = 20$) with students took place over a 1-month period in the fall of 2021 and included students from five school districts spanning nine unique school sites. Students from two different states were also represented in the study. The participant group also featured a mix of students who attended public charter schools and public schools. Three unique public charter school networks and six traditional public school districts

represented the participants in the study. All three charter networks and traditional public school districts participate in the NSLP.

Within the study sample, it was also important to get participation from a wide variety of geographically different middle schools to help better explain if any of the data were unique to any subcategory of districts. Table 7 outlines the geographical characteristics of the schools and school districts that were represented in the qualitative study.

Table 7

District/School Geographical Data

District #	Number of Schools With Students Interviewed	Urban/Suburban/Rural
District I	School 1 (Public)	Suburban
District II	School 8 (Public)	Rural
District III	School 9 (Public)	Rural
District IV	School 5 (Public)	Suburban
District V	School 2 (Charter) School 3 (Charter) School 4 (Charter) School 6 (Public)	Urban
District VI	School 7 (Charter)	Urban

Interview Procedures

Semi-structured interviews were held during the fall of 2021. Each interview was completed over Zoom or in person and lasted 20–30 minutes. Due to the convenience of Zoom coupled with COVID-19 precautions, 16 of the 20 interviews took place on Zoom, and the remaining four interviews took place in person at convenient locations for all students. The interviews started with questions centered on the students' eating habits at home and gradually became more specific around the students' experience in their schools cafeteria and the students' experience within the NSLP. The interview questions were written intentionally in age-appropriate language and with age-appropriate question stems along with various probing

questions if students needed more information to process the question. Appendix Table 1A lists the questions and probing questions that comprised the semi-structured interview.

Data Analysis

The data analysis began with the researcher first creating a list of the *a priori codes*. The categories under which these codes were listed were situated around observations from the quantitative data as well as prior research. The codes selected also centered on previous research on the NSLP and the student experience. The codes and categories were associated with the interview questions, specifically surrounding food intake and student perception. Appendix Table 1B lists the full *a priori* codes selected for this study.

The interview questionnaire was informally piloted with three students before any student interviews took place. The interview questionnaire was also piloted and examined, and feedback was given during a qualitative interview focus group in the fall of 2020. The interview questionnaire served as the foundational instrument that was used for all 20-student interviews. Age-appropriate questions and probes specifically formulated in kid-friendly language were used with the hope that these questions would bear more fruitful answers from students.

Once the 20 interviews were completed, the interviews were merged into a program called "Happy Scribe," which is an online transcription program that transcribed the interviews from an audio file to a Microsoft Word file. The researcher then listened again to each audio file and corrected all mistakes made during the digital translation to transcribe a clean copy of each interview. Once all 20 interviews were transcribed into a clean copy of the transaction, the researcher took the data collected and started to organize the data around the already selected *a priori codes*. The researcher during this time also began to pull out various codes that started to appear that weren't already associated with the *a priori codes.* Another round of data analysis

took place to take the commonly used *a priori codes* and the new, emergent codes, to develop broader themes that were represented throughout the interviews. The themes were then developed and placed into a spreadsheet where the researcher, during another round of analysis, placed a variety of student quotes under each category that they represented. Through another round of analysis, the researcher landed on the major themes of the qualitative study: *Student Meal Selections: Home vs. School*; *Student Drink Selections: Home vs. School; Lack of Lunch Selection Variety*; *Perceived Barriers to Fruit or Vegetable Consumption (Food Presentation)*; *Perceived Barriers to Lunch Consumption (Taste/Seasoning)*; and *Students' Understanding of Healthy Lunches.*

Chapter 5: Results

Quantitative Results

Table 8 presents a descriptive breakdown of food and drink items selected and consumed for 141 lunches of sixth-grade, NSLP participants. Among milk selections (white, strawberry, chocolate), chocolate milk comprised 60% of all milk selections, but it went completely unconsumed 55% of the time. White milk was wasted at a higher rate, being selected only 18% of the time and completely unconsumed 85%. These descriptive patterns suggest that although milk was often selected with a student's school lunch, most students did not benefit from the vitamins and nutrients in milk because they did not consume it. In contrast, juice had a higher intake rate, being fully consumed 89% of the time. For main meal items, chicken sandwiches or chicken strips were most commonly chosen, followed by nachos, pizza, and cheeseburgers/hamburgers. These four items represent approximately 93% of students' main meal selections. Students also had the option of selecting two side items, and the most popular selections were fresh fruit and French fries, which are chosen 18% and 16% of the time, respectively. In the sample, only 7% of lunches were fully consumed by students. The average school lunch that students selected appears to be somewhat unhealthy with many lunches resembling what might be ordered when visiting a fast-food chain restaurant.

Table 8

Descriptive Analysis of Meal Selection and Consumption (N = 141)

	Selection (%)	All Consumed (%)	Partially Consumed (%)	None Consumed (%)
Milk				
Chocolate	60	4	10	55
White	18	12	4	85
Strawberry	18	48	12	40
Not Selected	4			
Main Meal				
Chicken Sandwich/Strips	40	66	27	7
Nachos	32	71	29	--
Pizza	15	62	33	5
Hamburger/Cheeseburger	6	63	38	--
Other	4	--	83	17
Pancakes/French Toast	4	80	20	--
Juice				
Apple / Orange	94	89	4	8
Not Selected	6			
Sides (1-2 Selections)				
Fresh Fruit	18	73	19	8
French Fries	16	82	14	5
Bread	8	64	--	36
Fresh Vegetables	5	71	29	--
Processed Fruit	5	57	29	14
Tater Tots	5	71	14	14
Mashed Potatoes	4	--	50	50
Eggs	4	40	60	--
Cookies	2	67	33	--
No Selected	48			

Table 9 compares USDA requirements for the NSLP (grades 6–8) to the percentage of students in the sample consuming any amount of milk, meat/meat alternative, fruit, and vegetables. Only 5% of school lunches resulted in the consumption of vegetables, and while 18% of lunches chose a fresh fruit option, 92% of the time a fresh fruit option was chosen, fruit was

consumed. While sixty percent of all lunches did not lead to any milk consumption. These figures represent whether a student consumed any amount of a given food, so it is conceivable that the number of students not meeting USDA daily requirements for lunch is even higher than what is presented in Table 9.

Table 9

Percentage of Students Consuming any of the Food Items Required by the USDA for the NSLP (Grades 6-8)

	Consumed any (%)	USDA daily lunch requirements
Milk	40	1 cup
Meat/Meat Alt.	78	1 ounce
Fruit	16	1/2 cup
Vegetables	8	3/4 cup

Note. Results are derived from 141 school lunches of sixth-grade students.

Table 10 presents the percentage of selected nutritional content that students consumed. In formulating its nutritional recommendations, the USDA assumes an 85% level of food waste. However, unconsumed food tends to be much greater than this benchmark, and particularly so for certain types of nutritional content. For instance, while school lunches selected in this study are in the recommended window (600–700 calories) for calories, the actual number of average consumed calories is much lower at 443 calories. Consumed protein is only 68% of what was selected, whereas intakes of vitamin A, calcium, and iron are lower than 85% of selected amounts. As a positive finding, the lower intake of calories overall translates to lower intakes of sugar, cholesterol, sodium, and saturated fat relative to selected amounts.

Table 10

Percentage of Selected Nutrition That Students Consumed (n = 141)

	Selected Nutrition M (SD)		Consumed Nutrition M (SD)		Nutrition Consumed (%)
Calories	603.11	(90.21)	443.02	(162.98)	73
Protein (g)	26.82	(3.54)	18.23	(7.88)	68
Carbohydrates (g)	80.63	(16.96)	59.39	(22.84)	74
Fiber (g)	6.64	(2.53)	5.48	(2.85)	83
Total Sugar (g)	34.87	(8.17)	22.16	(10.72)	64
Saturated Fat (g)	6.34	(1.78)	4.57	(2.27)	72
Sodium (g)	0.76	(0.14)	0.57	(0.23)	74
Cholesterol (g)	0.05	(0.05)	0.04	(0.04)	75
Total Fat (g)	19.05	(2.54)	14.53	(5.69)	76
Vitamin A (mg)	912.68	1262.88	546.69	1147.19	60
Vitamin C (mg)	4.96	(11.35)	4.23	(11.33)	85
Calcium (mg)	459.31	(95.63)	262.63	(165.79)	57
Iron (g)	2.89	(1.76)	2.27	(1.70)	79

Selected nutritional content seems to be much higher than what students ultimately consume. To show how selected and consumed school lunches relate to healthy eating, Table 11 presents selected and consumed nutrition compared to recommended targets for nutritional content during lunch for middle school students. For selected nutrition, total calories align well with recommended targets while selected protein, fiber, vitamin C, and iron are well under recommended targets. The selected amount of total sugar is also 414% above the recommended target for lunch, although saturated fat, cholesterol, and total fat are under the recommended targets.

For consumed nutrition, calories drop to 74% of the recommended target for school lunch. Consumed protein and fiber meet only a little over half of the recommended amounts. Vitamin C is only 14% of the suggested amount. A relatively high wastage rate appears to substantially reduce intakes of sodium, cholesterol, saturated fat, and total fat. However, sugar

intakes remain considerably high at 263% of recommended targets. These consumption patterns indicate that consumed lunches tend to be higher in sugar and lower in many nutrients.

Table 11

Selected and Consumed Nutrition Compared to Recommended Nutrition Targets for School Lunch (Grades 6-8)

	Selected Nutrition Over/under on recommended targets (%)	Consumed Nutrition Over/under on recommended targets (%)	Recommend Targets[1]
Calories	101	74	600–700
Protein (g)	83	57	32.20
Carbohydrates (g)	161	119	50[2]
Fiber (g)	71	59	9.3
Total Sugar (g)	414	263	8.42[1]
Saturated Fat (g)	75	54	8.42[2]
Sodium (g)	107	80	.71
Cholesterol (g)	73	55	0.07
Total Fat (g)	75	57	25.27[2]
Vitamin A (mg)	379	227	241
Vitamin C (mg)	17	14	30
Calcium (mg)	104	60	440
Iron (mg)	56	44	5.2

Note. Unless otherwise noted recommended targets were derived from the Institute of Medicine's recommendation to the USDA for school lunch (Stallings et al., 2010)

1. Recommended target from the World Health Organization. 2. Recommended targets are from the USDA's Dietary guidelines for Americans: 2015-2020 (Dietary Guidelines Commission, 2015).

Table 12 presents the percentage of lunches that meet USDA nutrition targets for both selected and consumed school lunches. Only small percentages of students are selecting food items that allow them to meet recommended targets. For example, only 24% of students met recommended targets for calories, whereas no lunches met recommendations for protein. Only

15% of lunches met recommendations for fiber, and 3–5% met recommendations for vitamin C and iron. Only 6% of the lunches met recommendations for sugar, meaning that most students in the sample selected lunches higher in sugar than what is recommended. However, 94% of lunches met recommendations for saturated fat, 94% for cholesterol, and 100% for total fat. When examining consumed nutrition in Table 12, inadequate amounts of vitamins and nutrients in school lunches appears to worsen. Only 10% of lunches met recommendations for calories. Students consuming recommended amounts of carbohydrates drops from 98% to 60%. Very small percentages of students consumed lunches that met recommendations for fiber (8%), vitamin C (5%), iron (3%), and calcium (22%). For sodium (74%), cholesterol (94%), and total fat (98%), much higher percentages of student met recommendations, which was partly attributable to high wastage rates. Approximately 94% of students consumed sugar in their lunches at levels above recommended targets.

Table 12

Percentage of Selected and Consumed Nutrition in Sample Meeting Recommended Targets (Grades 6-8)

	Selected Nutrition (%) of lunches meeting targets	Consumed Nutrition (%) of lunches meeting targets	Recommend Targets[1]
Calories	24	10	600 -700
Protein (g)	0	0	32.20
Carbohydrates (g)	98	60	50[2]
Fiber (g)	15	8	9.3
Total sugar (g)	0	6	8.42[1]
Saturated Fat (g)	84	94	8.42[2]
Sodium (g)	34	74	.71
Cholesterol (g)	94	94	0.07
Total Fat (g)	100	100	25.27[2]
Vitamin A	99	64	241
Vitamin C (mg)	5	5	30
Calcium (mg)	78	22	440
Iron (mg)	3	3	5.2

Note. Unless otherwise noted recommended targets were derived from the Institute of Medicine's recommendation to the USDA for school lunch (Stallings et al., 2010)

1. Recommended target from the World Health Organization. 2. Recommended targets are from the USDA's Dietary guidelines for Americans: 2015-2020 (Dietary Guidelines Commission, 2015).

Summary of Findings—Quantitative

As seen through the quantitative findings there are multiple data points and trends that are observed. To start, chocolate milk was selected most out of any milk option, which comprised 60% of all milk selections, but chocolate milk went completely unconsumed 55% of the time that it was taken. White milk was wasted at a higher rate, being selected only 18% of the time while going completely unconsumed 85% of the time that it was selected. This differed from the juice selection and consumption metrics in which researchers observed that juice was fully consumed

89% of the time. Again, these results seem to indicate that students are consuming their juice option more than their milk option and students may not be benefiting from the nutrients that the milk provides.

The second major finding to come out of this research was finding what students were selecting for lunch most often. Students selected chicken sandwiches or chicken strips, nachos, pizza, and cheeseburgers/hamburgers most out of any of the food selections that were offered. These four items represented approximately 93% of students' main meal selections. This finding, along with finding that only 7% of all student's lunches went fully consumed, led the researcher to formulating questions surrounding these two findings in the qualitative interviews with students.

A third finding from the quantitative study centered on fruit and vegetable selection and intake. The researcher found that only 8% of school lunches resulted in the consumption of vegetables and only 16% of school lunches exhibited consumption of any fruit. This finding suggests that some students may not have eaten the more nutrient-dense food items that were being offered in the cafeteria, which in turn would suggest that students did not consume the nutrient-rich benefits that these foods provide. This finding led the researcher to formulate questions within the qualitative interviews with students about why they believe that vegetable and fruit options are being consumed at a lower rate.

Finally, new research published in 2022 by Adams et., al found similar results when they used photo analysis to determine the nutrient consumption of students from Title I elementary schools who offer free lunch. Utilizing photo analysis and plate waste analysis researchers found that only (23%) of lunches met reccomendations for total calores, (46%) of lunches met reccomendations for vitamin C, and (48%) met reccomendations for dietary fiber (Adams, et al.,

2022). While most students' lunches met recommendations for sodium (98%), protein (55%), calories from fat (82%), and saturated fat (89%); however, few met recommendations for total calories (5%), calcium (8%), iron (11%), vitamin A (18%), vitamin C (16%), and fiber (7%) (Adams et al., 2022). Similarly these researchers found that many lunches were lacking in the higher nutrient values.

While the quantitative research led the researcher to some clear findings around food selection and consumption among NSLP participants, this study also highlighted new questions. Some of these questions included; why the vegetable consumption for students was so low, and why there was such a difference in the consumption patterns of fruit compared to vegetables. Another question that arose when analyzing the quantitative data was what the relationship between students eating habits at home and at school were. The utility of a mixed method study allowed for the researcher to gain valuable student perspective around these questions within the qualitative interviews.

All of these questions were addressed through the qualitative interviews with students. The interviews also addressed students' perspectives regarding the NSLP and how they experience a typical school lunch hour. Using the quantitative findings to formulate and drive new questions centered on the students' experience in the NSLP helped the researcher gain a fuller understanding of the quantitative findings along with the student experience in the NSLP.

Qualitative Findings

Using qualitative interviews to better understand the student perspective of the NSLP along with utilizing the student perspective to better explain the quantitative findings is an important contribution to the gap in the literature, specifically around the difference between student selection and consumption cafeteria patterns. The qualitative interviews with students

allowed the researcher to gain insight into the student lunch experience surrounding what students were eating at home versus what they were eating at school. The student interviews also allowed the researcher to better comprehend the student perspective surrounding some of the quantitative findings, specifically, those centered on vegetable and fruit selection and consumption. The student interviews also helped the researcher better understand some barriers that students may face in relation to eating a more nutrient-dense school lunch.

Student interviewees talked about their own eating and drinking habits at home and at school. Students also described some of the perceived barriers and catalysts that supported more nutrient-dense food selection and consumption. Finally, students described how they viewed healthy eating specifically regarding the more nutrient-dense food options in their cafeterias.

While through this qualitative research design many different themes emerged, some of the bigger themes that the researcher found included: *Student Meal Selections: Home vs. School*; *Student Drink Selections: Home vs. School*; *Lack of Lunch Selection Variety*; *Perceived Barriers to Fruit or Vegetable Consumption (Food Presentation)*; *Perceived Barriers to Fruit or Vegetable consumption (Taste/Seasoning)*; and *Students' Understanding of Healthy Lunches.* These themes were uniquely associated with the qualitative study but also helped the researcher to better comprehend the students experience in the NSLP by providing student perspectives to the quantitative findings.

Student Meal Selections: Home vs. School

When students were asked about their favorite foods that they ate at home, 11 of the 20 students interviewed referenced that their favorite foods needed to be cooked or prepared by someone at their house. These selections included sandwiches, chicken strips, and macaroni and cheese. Another seven of the 20 students interviewed talked about foods that were typically store

bought and required no cooking time, such as chips, crackers, and cookies. Only two of the 20 students interviewed said their favorite foods to eat at home were either bought or ordered from a restaurant or fast-food establishment.

The students' most commonly selected favorite food or food group to eat at home was some form of pasta, with pasta being chosen by seven of the 20 interviewees as their favorite food or food group to eat at home. The second favorite food or food group that was chosen by students was some form of breakfast option such as eggs, bacon, and cereal. These breakfast items were selected as students' "favorite" by four of the 20 interviewees. Pasta and breakfast items made up 55% of what students mentioned when asked what their favorite foods were to eat while they were at home.

As mentioned above, the researcher was interested in better understanding if the SCT explained the student's food and drink choices at home in comparison to their food and drink choices at school. In comparison to the student's favorite choices at home, when asked what students typical lunch selection was from the cafeteria, pizza was selected in some form by 14 of the 20 interviewees along with some form of chicken that was selected by six of the 20 interviewees. The breakdown between favorite meals at home and favorite meals at school is seen demonstrated in Table 13.

Table 13

Student Home Choices vs. Student School Choices

Student Home Favorite Foods	Student School Favorite Foods
Pasta	Brings lunch most days
Pasta	Pizza or Chicken Strips + French Fries
Pasta & Fruit Salad	Cheese Pizza & Nachos with White Queso
Fruit Loops	Chicken Strips & Waffles
Blue Takis	Pizza + Peaches
Lasagna	Chicken Strips & Potatoes
Chicken Strips	Pizza
Salmon	Pizza & Carrots + Celery
Eggs	Cheeseburger & Nachos
Buffalo Wings	Fried Chicken + Mashed Potatoes & Pizza
Goldfish	Pizza
Bacon	Corn Dogs & Pizza
Peanut Butter & Jelly	Chicken
Chicken Nuggets + Macaroni	Chicken Tenders & Pizza
Pasta—Chicken Alfredo	Pepperoni Pizza
Pasta—Alfredo	Pizza
Bologna and Cheese Sandwich	Bagel Pizza
Cup of Noodles	Pizza + Oranges
Pineapples	Burgers & Macaroni and Cheese
Cereal	Pizza & Oranges

Table 13 shows pizza was selected at the highest rate by students as their favorite foods to eat at school (70%). Another 30% of students said some sort of chicken, sometimes alongside the pizza. Interestingly, 10% of students included a fruit in their favorite food selection at home versus another unique 10% of students who included a fruit in their favorite food selection at school. Finally, no student indicated that his or her favorite food to eat at home or at school was a specific stand-alone vegetable option.

This data is similar to the trends that the researcher saw in the quantitative study. Again, in the quantitative study, 93% of all student selections included either pizza, nachos, chicken strips/sandwich, or a hamburger/cheeseburger. These studies in tandem account for 10 different middle schools spanning across two states. It appears that through both the quantitative and

qualitative study, the highest percentage of selections included foods typically found in fast food restaurants, specifically, pizza, some sort of fried/baked chicken, nachos, and hamburgers/cheeseburgers. Employing the SCT, researchers may be able to find other, more healthy alternatives, to current lunch selections if they better understand what students eat at home. For example, the highest favorite food selection at home for students was some form of pasta or breakfast item, which was selected as a favorite by 55% of students, yet no form of pasta or breakfast item was selected as the students' favorite school selection. Better understanding students at-home eating experience may help policy makers and school leaders make more informed decisions about what other nutrient-dense foods can be offered in school cafeterias.

Student Drink Selections: Home vs. at School

Using the quantitative data in this study, the researcher wanted to better comprehend what students' drinking habits were both in and out of school. The quantitative data showed that chocolate milk was selected most out of all milk selections, comprising 60% of all milk selections, but it went completely unconsumed 55% of the time that it was taken. White milk was wasted at a higher rate, being selected only 18% of the time and going completely unconsumed 85% of the time. The researcher wanted to use the qualitative interviews with students to help explain what these results could mean. Of the 20 students interviewed, 50% of all students expressed that they either did not take a milk or, if they did, they did not drink it. Out of the 50% of students who said they did not take or drink their milk, four of the students cited being lactose intolerant as to why they did not get a milk. Of the 50% of students who did take and consume a milk, only one student said that they selected and consumed a full white milk daily, with the rest of students selecting either chocolate or strawberry milk. When students were asked what they typically drink when they are at home, 35% of students interviewed said that their favorite drink

at home was water, followed by another 40% of students who said their typical drink at home was some sort of a juice. Only one student said milk.

The quantitative data and qualitative data both demonstrate that students may not be selecting or consuming the amount of milk recommended through the NSLP. This finding highlights that the NSLP policy may not be attaining its intended results. Policy makers and researchers should seek to better understand this phenomenon as it appears through both the qualitative and quantitative study that milk is being wasted or not selected close to 50% of the time a student selects a lunch.

Lack of Lunch Selection Variety

Students were vocal during their interviews about the perceived lack of variety in some cafeterias. A lack of variety or food selection was mentioned in 35% of all student interviews. The students' perceived lack of variety/selection was mentioned in regards to changes that the students would make in their own cafeterias. The lack of variety/selection was also mentioned when students were asked about drink selections. Finally, the perceived lack of variety was mentioned when students were specifically asked about the quantitative data points that surrounded fruit and vegetable consumption in the cafeteria.

During the quantitative data collection, only 8% of lunches included any type of consumed vegetable. When students were asked specifically why these results might exist, they said that the lack of variety among the vegetables imped the selection and consumption patterns of students. One student said that if they did not like carrots but carrots were all that they were offered, they would not eat a vegetable that day. Another student said that there was only two or three vegetables he observed being served at his school. That student stated, "There isn't a big

selection of vegetables. There is usually only two or three [vegetables] that they switch through everyday."

The selection issue was not just discussed by students as it related to the vegetables being served but also in reference to cafeteria selections as a whole. When asked if they, the student, were in charge of all things school lunch and cafeteria management, was there anything that they would change? One student said, "So, like, the unhealthy lunches—we kind of have pizza all the time at lunch. We don't really have healthy lunches. We could have salads, and healthy sandwiches, and stuff like that, but we don't." Another student stated, "[I would offer] more items. It is just either pizza in one line, and another item in another line. They rarely switch it up." Another student said, "We almost get pizza every day for lunch. If I was the person in charge, I would want my students to have different lunches every day. I would change that we eat the same thing almost every day. I would also want to change that we have milk all the time, and I would want to also offer students water." Another student stated that they would offer "probably more options, and better quality of food. So, like, have stuff that is not soggy and sometimes that looks and tastes old, and it doesn't really have any flavor either."

From the qualitative interviews with students, it appears as though students want a greater variety of foods to choose from in the cafeteria. It seems as though the lack of variety or the greater variety of foods offered to students serve as either a deterrent or catalyst for selection and consumption. It appears that students are also aware of the perceived lack of variety in the cafeteria, and students seem to make their food selection decisions accordingly.

Perceived Barriers to Vegetable Consumption (Food Presentation)

As noted, interview questions were specifically created to help better explain the quantitative findings. A few of the questions posed to students centered on why some students

may not be eating their vegetable options. When asked this question, 35% of students said that the presentation or appearance of the vegetable was a catalyst as to whether they would select or consume the vegetable. One student said, “the vegetables look a little dry sometimes and unseasoned. Like it needs a little seasoning.” Another student said, “[For example,] with my sister it’s really about how it looks. She said sometimes when she looks at [the vegetables] sometimes she gets nauseous, and it really grosses her out the way that the vegetables look.” Another said, “certain times, the vegetables can look really soggy and can taste really old. Sometimes the vegetables just don’t look, how would I say that, good, I guess. There would be like water under the carrots where they were steamed in, and it would be like really nasty water.”

Appearance was also mentioned when students were asked about fruit selection. Students were selecting fresh fruit 18% of the time and fully consuming the fruit 73% of the time in relation to the vegetables, which was selected by students only 8% of the time and fully consumed 71% of the time. When students were asked about whether they or their peers would more typically eat fruit rather than vegetables, vegetables rather than fruit, or eating both at the same rate, 90% of all students interviewed stated that they saw fruit being eaten at a higher rate than the vegetables. It seems as though the appearance of fruit may make a difference. One student stated, “I think [students] are eating more fruit than vegetables because the fruit looks more appealing than the vegetables. They are cut in a little container, and we get a greater variety of fruit then vegetables.” Another student said, “students are eating more fruit than vegetables. The fruit just looks better than the vegetables. Most kids will eat the fruit because it looks better.”

It seems as though the appearance can either positively or negatively enhance a student’s perception of the food in the cafeteria. Students seem to feel the appearance of food matters.

Students seem to be more drawn to the fruit rather than the vegetables, which may be due to its display in the cafeteria or overall appearance. Understanding that the presentation of foods in a cafeteria may make a difference in student selection and consumption habits can be a useful finding for policy makers and NSLP implementers who may be able to make these changes at the policy/district level.

Perceived Barriers to Lunch Consumption (Taste/Seasoning)

Seasoning and taste also seem to be a main driver behind student's choice of selection and consumption of various foods in the cafeteria. Of the 20 interviewees, 16 (85%) mentioned that taste or seasoning was a deciding factor in their decision to eat or not eat an item. For example, when asked if they, the student, were put in charge of all things cafeteria related, were there any changes that they would make to their cafeteria, five students (25%), said they would change the way the cafeteria seasons the food. One student said, "I would change the seasoning. I would add sauces and add seasoning. They need to add more seasoning like desperately; there needs to be more seasoning." Another student said, "I would make them season the food more. I get that they have to follow the rules and what not, but I feel like they should learn more how to season the food. Also, more condiments."

Students also explicitly named the taste or lack of seasoning as a reason for their consumption habits of the vegetables in the cafeteria. When asked why few students may be consuming vegetables in the cafeteria, 30% of students said that the seasoning or lack of taste was a reason. For example, one student stated, "I don't like how the vegetables look sometimes. I do not like the vegetables that they are using. [Other students] don't like the way that they make the vegetables; they don't like the seasoning that they use. They don't like the flavor [of the

vegetables] or the texture." Another student stated, "Most of the time, the kids at our school don't like vegetables because they don't really season the vegetables."

As seen in the quantitative study, the more nutrient-dense foods such as the fruit and vegetables were being selected and consumed at a lower rate than the main meal selections. Through the interviews with students, it seems as though that seasoning matters and that middle school students are keenly aware of the seasoning that is used on their foods. Finding ways to better season different food items or giving students the opportunity to add their own seasoning to foods can be a measure of intervention that could potentially make more of these nutrient-dense items, specially, the vegetables, more appealing.

Students' Understanding of Healthy Lunches

The quantitative data suggested that many students were eating foods typical of a fast food restaurant. Ninety-three percent of students' main meal selections consisted of chicken strips/sandwiches, nachos, pizza, and cheeseburgers/hamburgers. It was important to utilize the interviews with students to help better discern whether students viewed the meals that they were consuming during lunch as healthy. Eight out of the 20 interviewees (40%) determined that they believed that they ate a healthy lunch when they consumed a school lunch. Six out of the 20 interviewees (30%) believed that they did not eat a healthy lunch when they consumed a school lunch. Finally, six out of the 20 interviewees (30%) believed that they either sometimes or maybe were eating a healthy lunch when they consumed a school lunch.

The rationale for whether students viewed their food as healthy, not healthy, or sometimes/maybe healthy was interesting because there were various similarities and differences across answers. For the eight students who believed that they consumed a healthy school lunch, their rationale can be seen in Table 14.

Table 14

Student Reponses—Healthy Lunch

Do you believe you consume a healthy lunch when you get school lunch?	**Why?**
Yes	"The school lunch is healthy. The meals that they choose are really healthy"
Yes	"Actually because I eat all the fruit and even some of my friend's fruit because they don't like it sometimes."
Yes	"I feel like [it's healthy] because it's school and they have to feed you healthy"
Yes	"It is a healthy lunch"
Yes	"Because they serve a lot of food and there is a lot of nutrition"
Yes	"It is pretty balanced and they put a lot of work into the food."
Yes	N/A
Yes	"They are serving you good meals, the oranges are good for you. It helps your body."

For the six students who believed that when they consumed a school lunch it was not healthy, their rationale can be seen below in table 15.

Table 15

Student Responses—*Not Healthy Lunch*

Do you believe you consume a healthy lunch when you get school lunch?	**Why?**
No	"Orange Juice is filled with sugar. The sides are fried. Most things are filled with sugar.
No	"The food is meant to last a long time. It's greasy."
No	"No, not really. It is not because the food isn't healthy. It's because the food was processed because it was meant to last a long time."
No	"Most kids probably aren't eating healthy foods."
No	"Sometimes if I don't eat all my lunch I don't get enough nutrients and stuff. They don't really give out vegetables and fruits or stuff like that."
No	"Going to say no because most of the time the food is greasy and stuff."

For the six students that believed when they consumed a school lunch it was sometimes or maybe healthy, their rationale can be seen in Table 16.

Table 16

Student Responses—Sometimes or Maybe a Healthy Lunch

Do you believe you consume a healthy lunch when you get school lunch?	Why?
Sometimes/Maybe	"Sometimes, parts of the lunch are healthy. The apples and the milk are healthy. The rest isn't healthy at all."
Sometimes/Maybe	"Some days there are healthy lunches, and some days there aren't. The unhealthy lunches are that we have pizza all the time for lunch. We do not always get healthy lunches. We could have salads and healthy sandwiches."
Sometimes/Maybe	"Mostly it is a healthy lunch. The sides are mostly good. The main course isn't really good. The main course, the burgers are fattening, the nuggets are fried, the spaghetti has a lot of meat."
Sometimes/Maybe	"Some days are better. Just the pizza is really greasy and not that good. Sometimes yes, and sometimes no."
Sometimes/Maybe	"Partially yes and partially no. Depending on what it is. The tacos are greasy. The vegetables and fruit, yes."
Sometimes/Maybe	"I don't know. Sometimes it could be very healthy and good. The same time they add unnecessary items to the plate. It felt like they were adding stuff to [the lunch]."

As the above tables demonstrate, students seem to have some knowledge surrounding what parts of the lunch are healthy or what parts of the lunch are unhealthy with students from the *not healthy, healthy,* and *sometimes healthy* groups all mentioning that the fruits and vegetables are healthy options. Couple this with the finding that when students were asked the question, "What is the healthiest lunch a student can eat in the cafeteria?" Seventeen out of the 20 interviewees (85%) said that a salad would be a part of their healthy meal. It appears that students may know what a healthy lunch looks like, yet based on the quantitative findings; it appears that students are still selecting some of the more unhealthy main meal options 93% of the time.

Summary of Findings—Qualitative

The qualitative study was used to gain greater perspective around the quantitative findings and to learn participants' perspectives of the NSLP. Through interviews with students, some distinct themes emerged as students described their lunchroom experiences. The first theme was the comparison of at-home favorite lunches to at-school lunches that students typically select. Students' favorite meals eaten at home were not typically reflected in the students' favorite meals eaten at school. Rooting this finding and study in the SCT can help policy makers and school leaders' better think through menu options and how they reflect the student population that they serve.

The second theme that emerged is the similarities and differences between student drink selections at home and at school. Students may not be drinking their milk as the NSLP outlines. Of the 20 students interviewed, 50% of all students expressed that they either did not take a milk, or, if they did, they did not drink it. Of the 50% of students who did take and consume a milk, only one student said that they selected and consumed a full white milk daily, with the rest of the students selecting either chocolate or strawberry milk. This finding strengthens the quantitative findings. In the quantitative study both chocolate and white milk went unconsumed 50% and 85% of the time, respectively. Both the quantitative and qualitative studies demonstrate that students may not be consuming their milk at the rate set forth by the NSLP, and further research is needed to determine what the long-term implications could be if over 50% of NSLP participants aren't selecting or consuming their milk.

The third theme was that it appeared within the qualitative research centered around a perceived lack of variety of food selections in the students cafeteria. Thirty five percent of all students perceived there to be a lack of variety/selection in their cafeteria. More research is needed to better understand how variety affects student selection and consumption habits.

The fourth theme concerns the perceived barriers of consumption regarding taste and seasoning. Of the 20 interviewees, 16 students (85%) mentioned that the taste/seasoning was a deciding factor in their decision on whether or not to consume an item. This finding may offer policy makers and school leaders insight on quick interventions that could potentially help better season the food. These potential interventions include salt and pepper, hot sauce, and other condiments located in places around the cafeteria available for students. More research should be done to know if these intervention methods would prove successful in helping more students consume their more nutrient-dense food options.

The fifth theme concerns the perceived barriers to vegetable consumption in food presentation. Using the quantitative data to drive some of the questions students were able to articulate why other students may or may not be eating all of their vegetables. Thirty-five percent of all students interviewed said that the presentation or appearance of the vegetable was a catalyst as to whether they would select or consume the vegetable. As policy makers and school leaders continue to explore the effectiveness of the NLSP, understanding how the appearance of foods affect selection and consumption patterns for middle school students will be important.

The sixth and final theme from the qualitative interviews concerns students' knowledge of healthy foods and healthy eating. When students were asked what the healthiest meal in their current cafeteria that they could select to eat would be, 17 out of the 20 interviewees (85%) said that a salad would be a part of their healthy meal. It appears as though students know what healthy foods are and what healthy eating is, yet, based on the quantitative data, students still seem to be deciding to eat the foods that are not as nutrient-dense as others.

Through qualitative interviews with students, valuable participant perspective was gained. Few studies, have sought to interview participants from the NSLP to gain their

perspective on the program. Few studies, if any, have also taken a mixed-method approach to understanding student selection and consumption patterns in the NSLP. These qualitative interviews, while not generalizable to the entire middle school population, lend insight into the student perspective of school lunches, which can be a valuable tool for policy makers and school leaders when measuring the efficacy of the NSLP.

Chapter 6: Discussion

As rates of childhood obesity have reached an unconscionable level in the United States, the dietary habits that schools promote may be of great consequence for combatting childhood obesity. In recent years, policy makers have revised nutrition standards within the NSLP in an attempt to reduce childhood obesity and encourage healthy eating during school lunch. Studies have found associations between participation in the NSLP and poor health outcomes for students, but these analyses are confounded by many factors that coincide with program participation (Campbell et al., 2011). Little work has examined what students'consumption patterns are when they receive a school lunch under the NSLP. In addition, little to no research has been completed to better understand the middle school, student perspective of the NSLP. This research takes a bold approach at addressing both of these questions by utilizing a mixed-methods design to better explain the experiences of the NSLP participants. This research has taken a two-part approach in addressing these gaps in the literature. The quantitative portion of this research analyzed the actual nutritional intake from school lunches by using an innovative, real-time data recording tool to determine what students selected and consumed during lunch. The qualitative portion of this research followed the quantitative study by targeting 20 students who participated in the NSLP to better understand the student perspective of the program along with helping to explain why the quantitative results may have existed.

Drink and Milk Selections

The quantitative portion of this research found that out of the 141 lunches observed, chocolate milk was selected most at 60% of the time that a milk was selected, but when selected, the chocolate milk went unconsumed 55% of the time that it was taken. In contrast, white milk was selected 18% of the time and went unconsumed 85% of the time that it was taken. This milk

consumption data is aligned to a similar study that examined student milk consumption in two suburban South Carolina schools in which the researchers observed 968 lunch selections from K-5th graders (n=968) (Peckham et al., 2021). Similarly, researchers found that students selected the chocolate milk option with the most frequency, 75% of the time a milk was selected (Peckham et. al., 2021). This aligns with the qualitative study in which 90% of all students who said that they normally selected a milk during lunch said that they either selected a chocolate or strawberry milk.

Yet, while flavored milks were selected at a higher rate than the non-flavored or white milk options, the consumption patterns of the flavored milks is concerning. In the qualitative interviews with students, 50% of all students interviewed stated that they did not select a milk while at lunch. This also aligns to the quantitative study in which chocolate milk went unconsumed 55% of the time it was selected, white milk went unconsumed 85% of the time it was selected and strawberry milk went unconsumed 40% of the time that it was selected. Throughout this research it appears that there is a discrepancy in the amount of milk that is actually being consumed during school lunch.

The qualitative data also revealed that students favorite drink choices at home may not be fully represented in their local cafeteria offerings. Thirty five percent of interviewees said that their favorite drink at home was water with another 40% of interviewees saying that their favorite drink at home was juice. Policy makers and school leaders may want to gain better insight into the actual milk consumption happening within the NSLP and work to determine what benefit would be lost if milk were no longer required and another item, such as water, were offered. As both the qualitative and quantitative data suggest that students may not be consuming all of their milk.

A potential intervention that policy makers could consider is to require a water option with or in substitution of the milk option within the NSLP policy. This could ensure that students have greater access to a drink that would help them remain hydrated and could cut down on milk waste. While milk consumption may be important, water consumption is as well. The Institute of Medicine of the National Academies recommends that students who are between nine and thirteen years old should be consuming over two liters of water a day (Food and Nutrition Board, Institute of Medicine, National Academies, 2005). The Institute of Medicine of the National Academies recommend that boys should be consuming 2.4 liters of water a day and girls should be consuming 2.1 liters of water a day (Food and Nutrition Board, Institute of Medicine, National Academies, 2005). More research is needed to explain what the nutritional difference between milk consumption and water consumption during lunch could mean for students' nutritional intake and overall health.

However, researchers have observed that when students have greater access to water, they will increase their water consumption. Researchers in New York City, using self-reported fluid consumption metrics, observed the difference in water and milk consumption during lunches when water jets were installed at nine different schools (Eible et al., 2015). Researchers found that 3-months post water jet installation, a "3-fold increase" (increase of 21.63 events per 100 students) in water consumption was seen along with a much smaller decrease in milk consumption post water jet installation (decrease of -6.73 events per 100 students) (Eible et al., 2015). At 1-year post water jet installation there was a similar increase in water consumption and no additional decrease in milk taking (Eible et al., 2015). While the cafeteria where the quantitative data was collected had water jets installed for students, better understanding what

the availability of bottled water could mean for student water consumption is an important next step for researchers.

As researchers continue to monitor, examine, and analyze the NSLP, fluid consumption will be an important component. Better understanding the nutritional value that milk adds to a typical school lunch is important when trying to assess new drink options. This research revealed that many students either are not taking a milk or are taking a milk and not consuming it. However, students may be more apt to take a water option if one were avaiable. More research surrounding school lunch consumption patterns and habits is needed to better predict what the effect that not drinking the milk option, or rather consuming a water option, could have on students' nutrient intake and overall health.

Lunchroom Selection Patterns

Throughout the lunch selection process, 93% of student's main meal selections were comprised of chicken sandwiches/chicken strips, nachos, pizza, and cheeseburgers/hamburgers. Students were also afforded two sides. The most popular side selections included fresh fruit, which was selected 18% of the time, and French fries, which was selected 16% of the time. Within the sample, however, only 7% of lunches were fully consumed by students.

This finding is aligned with the qualitative data, which found that pizza was selected as a favorite school food by 70% of all interviewees, with another 30% of students describing some sort of chicken as being a favorite school lunch option. These findings indicate that students are selecting foods similar to what someone may find a convenience store or fast-food location. This aligns to prior research that suggests that students from low-income communities may eat a higher frequency of high-calorie, low-nutrient-dense foods, which may contribute to weight gain

(Heidelberger & Smith; 2015). Yet when students were asked what their favorite lunch options were when they were at home, 55% of student selections consisted of pasta and breakfast items.

There appeared to be a lack of variety within the quantitative portion of this research as 93% of students selected four main food options. To increase selection variety, a potential intervention could be utilization of a pre-ordering software in which students have access to all meals and can pre-order their meal before they enter the lunchroom. As the SCT suggests, students will often select foods that they are familiar with or accustomed to. It could be that students have a routine and rarely try other options due to their familiarity with their current selection and consumption pattern. Researchers have found that using a pre-ordering software where students also received "behavioral nudges" based on the United States of Department of Agriculture (USDA) MyPlate recommendations while pre-ordering their lunch resulted in a "significant" increase in fruit, vegetable, and low-fat milk selection (Miller, et al., 2016). It could be that, as the SCT would suggest, students get into a pattern of selection and consumption, and they do not explore other food options. The use of a pre-ordering software could help students better identify healthier items, especially if within the software there are "behavioral nudges" and allow students more freedom to try and explore other food options.

Another potential intervention is around student preference. As this research is rooted in SCT, it suggests that student's previous experiences can affect students current experiences and decision-making (Bandura, 2001). While 55% of students expressed that their favorite foods to eat at home were pasta or breakfast items, these choices were not reflected once when asked what students' favorite meal or typical meal selection was at school. This finding highlights a potential area for intervention moving forward by offering a greater selection of nutrient dense food options that students are interested in or prefer.

In the qualitative study, students highlighted their hope for greater food selection and choice in the cafeteria. Thirty five percent of students in the qualitative interviews cited that the lack of choice and variety in their cafeteria affected their lunchroom choices. A greater variety of food choices centered on the students' preferences may be another area for intervention. If policy creators and school leaders are able to better understand students'eating habits at home and what students in their communities enjoy eating, menus that are more reflective of student food interests can be designed. Again, only 7% of all lunches were fully consumed by students. Better comprehending student selection and consumption patterns at home along with student preferences may be an intervention that can support healthier student consumption patterns in school cafeterias centered around the foods that students have prior experience consuming.

Barriers to Vegetable Consumption

The qualitative portion of this research also indicated the perceived taste and appearance of food offered to students served as a major catalyst for student selection and consumption decisions. In the qualitative study, 85% of students highlighted the importance of taste, specifically the use of seasoning, when making selections in the cafeteria. Students talked about how the lack or perceived lack of seasoning caused students to not select or consume different foods.

Students in their interviews highlighted the importance of seasoning, especially when it came to their vegetable options. This aligns to the quantitative data as only 8% of students selected a vegetable option. Students in their qualitative data expressed that they did not like the vegetables in general with one student saying, "I don't like the vegetables. I don't like how they make it. I don't like the seasoning that they use. Sometimes they serve peas and stuff, and it looks mushed together, and it doesn't look appetizing." This type of perception is important for

researchers and policy makers to note, as it appears that students are very perceptive to the seasoning or lack thereof.

This dual finding appears to offer researchers and policy makers a potential method of quick intervention in helping more students eat their more nutrient-dense vegetable options by creating a "seasoning station". With so many students discussing the seasoning that is or is not provided in their cafeteria, especially when asked about the available vegetable options, a mode of intervention could be adding various seasoning or condiment stations to cafeterias. This potential intervention could help students consume a higher percentage of one of the most nutrient-dense food offerings through the NSLP, the vegetables.

Adding more herbs and spices to foods, specifically vegetables is not a new intervention idea. Researchers D'Adamo and colleagues, studied this school-based intervention program at an urban, economically underserved, and predominantly African American high school in Balitmore Maryland (D'Adamo et al., 2021). Researchers observed the difference in willingness to try vegetables, and vegetable intake of two identical vegetables recipes, with one recipe adding in various herbs and spices and the other not adding any herbs or spices. While the researchers did not find any statistical difference in the students willingness to try the vegetables, they did observe that the vegetables with herbs and spices had a 18.2% higher total intake than vegetables cooked without the herbs and spices (D'Adamo et al., 2021). This research suggests that the addition of herbs and spices could potentially increase vegetable consumption and is aligned with the qualitative interviews in which 85% of all students interviewed mentioned that the taste, specifically the seasoning mattered.

Another finding from this research has been the importance that students place on the presentation of vegetable offerings throughout the cafeteria. In the qualitative interviews, 35% of

all students expressed that the vegetable presentation was a determinant in whether or not the student would select or consume the vegetable. One student said, “Certain times, the vegetables can look really soggy and can taste really old. Sometimes the vegetables just don’t look, how would I say that, good, I guess.”

This finding from the qualitative study can also help to potentially explain the lack of vegetable consumption in the quantitative study as well. This finding can also help serve as a potential intervention in the cafeteria. If policy makers can find more effective ways to present some of the more nutrient-dense foods in ways that are appealing to students, there may be an increase in consumption based upon the student perspective and the weight that students seem to place on food presentation.

Nutrient Consumption in Cafeterias

Another major finding came from the quantitative study, specifically regarding the nutrients that students either did or did not consume while in the cafeteria. The first finding was that some aspects of the lunch were not being fully consumed at the rate to make them beneficial to students. For example, 24% of the school lunches that were selected by students were within the USDA recommended window for calories, which is 600–700 calories per lunch. Yet, using the real-time data collection tool it was found that the actual calories consumed might have been much lower. Specifically, students may be only consuming, on average, 443 of those calories, with only 10% of all lunches meeting the recommended amount of calories set fourth by the USDA. This finding also aligns with protein and vitamin A consumption. Students were found to be only consuming 68% of the protein that they selected and less than 85% of what they selected in terms of vitamin A, calcium, and iron.

This finding illustrates that students may not be consuming the entirety of their lunch, and more specifically, the recommended amount of calories, protein, vitamin A, calcium, and iron. The lower intake of the calories overall does translate to a lower intake of sugar, cholesterol, sodium, and saturated fat in comparison to the selected amounts. This finding helps to highlight to dieticians, researchers, and policy makers the differences between what foods are selected versus what foods are consumed and what this can mean for students' nutritional intake. This finding demonstrates that if researchers continue to only monitor what students select, they are only able to observe what students are putting on their plate rather than what they consume, as this difference appears to be substantial.

The next finding from the nutrition data is that the nutritional content that students are selecting for lunch seems to be much higher than what students end up consuming. For example, the calories that students select are in the recommended targets for lunches, while selected protein, fiber, vitamin C, and iron are well under the recommended targets. Analyzing the selection versus the consumption data show that while sugar was particularly high at 263% of the recommended target, the calories, vitamin C, sodium, and fat consumption is below the recommended targets. In addition, very small percentages of students consumed lunches that met the recommendations for fiber, vitamin C, iron, and calcium, whereas a higher number of consumed lunches met the recommendations for sodium, cholesterol, and total fat. Indeed, 94% of students were consuming sugar in their lunches at levels above the recommended targets set forth by the WHO.

These findings seem to be aligned to previous research from Cullen, Watson, and Dave in which they found that students participating in the NSLP only selected and consumed a vegetable 40% of the time (Cullen et al., 2011). These researchers also found that only 2/3rds of

students selected a vegetable with only 67% of students consuming the vegetable that they selected (Cullen et al., 2011). These researchers also found that less than 4% of students selected a dark green or orange vegetable (Cullen et al., 2011). While this research used a data system to average potential student consumption, the findings do seem to align with the findings within this research which suggests that there is a difference between what students select and what students consume.

This research continues to highlight the differences in what is being selected in cafeterias versus what students are consuming. This research not only points out that students who are enrolled in the NSLP are consuming lunches higher than the recommended targets for sugar but also that students enrolled in the NSLP are consuming a lower number of nutrients than what they are selecting for lunch. These findings highlight the need for policy makers, researchers, and school leaders to better comprehend what students are both selecting and consuming in cafeterias across the country as these two nutrient values appear to be markedly different.

Previous Research

Previous research on student participation in the NSLP was mixed with many studies reporting associations between program participation and increased BMI (Capograssi & You, 2015; Hernandez et al., 2010; Millimet et al., 2010; Schanzenbach, 2009), and others reporting either no change or positive health changes in students (Alfonso et al., 2019; Briefel et al., 2009; Gundersen et al., 2012). In the quantitative portion of this research, food selection patterns indicate support for a potential link between NSLP program participation and poor health outcomes as the consumed lunches appear to be generally high in sugar and lower in nutrients. This aligns to previous research by Heidelberger and Smith (2015), who found that children from low-income households consume a high frequency of high-calorie, low-nutrient-dense foods.

This also aligns to research that suggested that people who live with food insecurity and food inadequacies face prolonged diet changes such as consuming foods with high levels of sugars, trans-fat/saturated fat, and refined grains (Estreet et al., 2018).

In addition, food selection and food consumption also appear to be markedly different. The federal government assumes an 85% food consumption rate, but results from the quantitative study of this research suggest that this rate is far lesser and that nutritionally dense items tend to be wasted at higher rates (Cohen et al., 2013). For example, most students received milk with their lunch, but the vast majority of students in the sample did not drink any of the milk that they selected. This seems to align with the limited research on school food consumption patterns among students. Scholars have weighed lunch trays and used before/after photos, generally finding high food waste and low nutrient density in school lunches (Cohen et al., 2013).

These findings also appear to align to the research that suggested that 36% of parents who reported low/very low food security also reported low fruit and vegetable intake (Guzman & Goss, 2012; Caspi et al., 2012). This finding was demonstrated in the qualitative study when students were asked why vegetable intake may be low in their cafeteria. Seventy percent of all interviewees explicitly said that they believed that students did not like the vegetables being served in the cafeteria. It appears as though prior research (Guzman & Goss, 2012), the quantitative study (only 8% of students consumed any vegetables), and the qualitative study (70% of students suggesting students don't like the vegetables served) all suggest that students from low-income communities may not be consuming the recommended amount of vegetables at home or in the cafeteria. More research is needed to better explain this trend, yet these findings highlight the need to better understand student consumption patterns of the more nutrient-dense items during school lunch.

Home Selection vs. School Selection

The qualitative study within this research also indicated that student's home selections did not necessarily mirror the selections that students made while in the lunchroom. For example, the two most recurrent home "favorite food" selections that students stated were pasta and breakfast foods. These two items accounted for 55% of student favorite food selections at home, yet no form of pasta or breakfast item were named when asked what the students' favorite school lunch selection was. Utilizing the SCT, it could be surmised that, if these types of food were offered, potentially a higher number of students would select either pasta or a breakfast option. This data aligns with the quantitative data as well. When a breakfast item (e.g., pancakes, French toast) was selected as a main meal item during lunchtime in the quantitative study, it was fully consumed 80% of the time and only partially consumed 20% of the time. The fully consumed rate (80%) was higher than any other main meal selection that students could choose. This highlights that a potential "breakfast for lunch" option may help students fully consume their meal by adding the type of variety that students want. As policy makers, cafeteria implementation managers, and school nutritionists continue to make decisions about menu options and food service, taking into account what students eat at home to help inform menu options could be a helpful intervention when trying to ensure that more students finish their meals.

In the quantitative portion of this research study, the researcher also found that 93% of students' main meal selections consisted of chicken strips, nachos, pizza, and cheeseburgers/hamburgers. The qualitative interviews with students may have helped researcher discern the reason why. Thirty-five percent of students in the qualitative interviews cited that the lack of choice and variety in their cafeteria affected their lunchroom choices. It seems as though

students value a greater variety or option within the cafeteria. For example, students praised their cafeteria's greater fruit options as the reasons why some students were eating more fruit than vegetables. While students also cited their cafeteria's lack of vegetable options as one of the reasons why some students may not be eating the "stand-alone" vegetable options during lunch.

These findings are also aligned to Payán and colleagues who utilized eight focus groups in three Los Angeles High Schools (n= 64) to determine the student experience within the NSLP. While this research targeted high school participants, researchers found that one of the barriers to student's consumption was a lack of variety (Payán et al., 2017). Students in this study, similarly to the qualitative study within this dissertation, stated, "it's like the same meal every week" (Payán et al., 2017 pg.665). It is important for researchers and policy makers to better determine how to increase variety for students.

Moreover, in the qualitative interviews with students, when students were asked, "If you were in charge of the cafeteria and could make any changes to the cafeteria, what would they be?" Twenty five percent of all students said that they would make changes to the variety of foods offered. Grounding both studies in the SCT, a potential intervention that school lunch policy makers and school leaders could make would be to survey families and students to understand their at-home eating habits. Utilizing this survey, policy makers and school leaders could potentially find a way to offer a greater variety of the foods that students eat at home.

Students Understanding of Healthy Lunches

Students also seem to understand what a healthy lunch is and what is not a healthy lunch. When asked what the healthiest lunch a student could select from the cafeteria was, 85% of all students stated that it would consist of some sort of salad option. Yet again, in the quantitative study, 93% of all students were still selecting some of the least nutrient-dense meal options for

their main course. Policy makers, cafeteria implementers, and school leaders could use this research to help shape or revise ways that they offer foods to students. Knowing that students possess the knowledge that a salad is a healthy alternative, schools may begin to think through how they could curate better looking and better tasting salads for students. The researcher found through the interviews with students that students are keenly aware of taste and appearance. Couple this with the finding that fresh fruit was selected and consumed at a higher rate than vegetables and that the fresh fruit offered in cafeterias seems to be thought of more positively than the other vegetable options. Policy makers and schools may have an opportunity to create more fruit based salads that appeal to a greater number of students as they strive to create balanced meals that are appealing to students.

Both the quantitative data collection and the qualitative interviews help to address a gap in the literature concerning the differences between what students are selecting in the cafeteria versus what students are actually consuming during lunch. Both the quantitative and qualitative studies have shown that students may not be selecting and consuming the more nutrient-dense foods. The vegetables in particular are seen by some students as “mushy” and “unseasoned” and do not seem to be typically consumed when selected. Students also seem to favor pasta and breakfast foods when they are at home, yet a lack of selection in the cafeteria may be stopping students from consuming more nutrient-dense options that they are familiar with at home. The quantitative data has shown that in place of these foods, students were selecting the pizza, chicken fingers/sandwiches, nachos, and hamburgers/cheeseburgers at a 93% rate. This research also highlights that students seem to have some understanding about what healthy eating is, yet students are keenly aware of the appearance and taste of the foods that are being offered. This data helps to begin to address a gap in the research as it relates to the selection and consumption

patterns of students and can offer policy makers, district leaders, and school nutritionists' data that can be helpful in their decision-making.

The appearance of foods was also seen in the Payán focus groups. High school students who were enrolled in the NSLP and interviewed during focus groups with Payán and colleagues also stated that appearance seemed to be a deterrent/catalyst for consumption. Within these focus groups, students stated "that they generally disliked items that appeared to be previously frozen or food that "looks reheated, it's not fresh (Payán et al., 2017 pg. 665)." Finding ways to enhance the appearance of the fruit and vegetable offerings could be an intervention worth noting.

While there appears to be areas of improvement within the NSLP, the findings in both the quantitative and qualitative portions of this research do not seem to negate that the NSLP is a positive addition to schools as it aims to equitably serve more nutrient-dense foods to some of the country's most vulnerable students. These findings also do not seem to point to a complete overhaul or abandonment of the NSLP as the policy seems to be an ambitious way to provide equitable food access to students across the country. However, this research offers a new, innovative perspective directly from a school cafeteria along with program participants. The quantitative portion of this research offers a potentially more accurate and innovative approach to determining what foods students are selecting and consuming in the cafeteria than previous studies or within the current NSLP monitoring system (Food and Nutrition Service, USDA, 2010). Moreover, the qualitative interviews with students offer the students' perspectives concerning school lunches and offer student-based suggestions directly from NSLP participants that could enhance the trajectory of the NSLP. More research will be needed to better understand the consumption habits of students who are enrolled in the NSLP and greater focus on the

participant experience is needed to fully comprehend the student perspective, yet this research offers suggestions and findings that can enhance the NSLP experience for some of the nation's most vulnerable students.

Limitations

Quantitative Study

There are several limitations to the quantitative study. Even though this study undertook a careful approach to determining food consumption during school lunch, the data collected was confined to one school and may not be generalizable to other school settings. This singular school, while a title I school, is not reflective of all title I schools in the United States. Schools across cities, states, and the country all have distinguishing characteristics, especially when looking through the lens of food and drink consumption. The school setting for the quantitative study inherently has different characteristics from other middle schools across the country. The participants from where this research was collected may have greater or lesser food and drink access than parents and students across other middle school communities. The participants in this study may also have faced differing variables from other students and parents such as food security, transportation, education attainment, and it is important for the reader to have this perspective when reading the study and findings.

Second, when the researcher was actively engaged with this research in the cafeteria, the researcher was checking individual food items that students selected and consumed. On the data tool listed in Appendix 1C, the researcher marked items as unconsumed, one-fourth consumed, half-consumed, three-fourths consumed, or fully consumed. This design did not provide the exact amount of consumed food and drink, although it is a rather considerable improvement upon prior analyses of student school meal consumption. While an improvement from previous

studies about student meal consumption, this approach still is not a fully accurate measure of consumption.

In addition, the precise amount of the food served to students was also not exactly accurate due to the way in which this cafeteria served meals. In the cafeteria under observation, the child nutrition workers served the food by hand, and while the food portions appeared to be relatively the same, this is not an exact representation of the food on the student's plate. For example, student A and student B could both get green beans as a side item, but in this design there was no way to measure how similar the portions of green beans were when they were served onto the plate due to human error. In turn, it made using the nutrition information that was provided for each food item potentially not entirely accurate based on the differences in serving sizes that were provided from the child nutrition workers.

Third, because of school closures in spring of 2020 due to COVID-19, the duration of the data collection period was cut short. The researcher was only able to observe 141 (*n = 141*) lunches throughout the quantitative study. This sample size cannot be generalizable to the entire middle school population, and more observations will be an important next step for researchers seeking to continue this work.

Finally, this design highlights the need for further research. The researcher chose a new and innovative approach to better comprehending student selection and consumption patterns in the cafeteria by using a new, real-time data-collection tool. While the researcher took steps to more accurately diagnose student selection and consumption habits in the cafeteria, there seem to be ways in which future research can build on this design. Again, finding ways to use this model in different title I middle schools throughout the country will be an important improvement as this study focused on one school that was represented by a unique set of characteristics. Future

research centered on multiple school sites will be an important improvement to this current study.

Next, finding ways to more accurately diagnose specifically what students are consuming in cafeterias may be an important improvement for future research. While the researcher took a new approach to identifying selection and consumption trends in the cafeteria, more accurately determining exact consumption will be an important improvement. The researcher used a tool that gave the researcher the ability to monitor the amount of food consumed such as one-half or three-fourths consumption rates. Yet finding ways to more accurately measure the amount of a liquid drank and the amount of a food consumed will be helpful for researchers moving forward.

The quantitative study design took an innovative approach to better understanding consumption patterns in a middle school cafeteria. This design was limited by the sample size and the accuracy of the consumption data and the subsequent nutritional information that was collected. Yet this study provides a more in-depth observation of what students are consuming in middle school cafeteria's than the current model that exists through state compliance measures (Food and Nutrition Service, USDA, 2010). Using this quantitative approach could be a quicker and more effective tool in comprehending participant consumption habits in cafeterias.

Qualitative Study

There are also several limitations to the qualitative study. While the qualitative portion of this research sought to better understand the student perspective of NSLP participants along with addressing a current gap in the research in how students experience the NSLP, there were limitations to the study design. The number of participants, barriers to participation, participant understanding, social desirability bias, and the researcher's qualitative interviewing skill set are all ways in which the qualitative study was limited.

First, the participant population for this study was 20 students who were interviewed from two different states. Six traditional public schools were represented throughout the qualitative interviews as well as three unique charter networks. While through this study the researcher was able to interview 20 students (*n = 20*), these students cannot be generalized to the entire middle school population across the country. Even with nine schools represented throughout this study, the study population cannot be representative of the entire population of middle school students. Future researchers will need to increase the population size for any generalizable conclusions to be made.

The next limitation in the qualitative research design was the convenience sampling method used to identify student interviewees. Students and families may have been selected who were more capable of engaging with the research, families who were more involved, or families that had a greater means to interview. For example, while the researcher explicitly stated that the interviews could take place over Zoom or in person, some families may have not had access to internet or have felt comfortable for the interviewer to interview their child at an in-person location. For future researchers to curb this limitation, finding new ways of engaging all families who participate in the NSLP will be an important contribution.

Participant understanding could have also limited this study. The researcher was unable to gauge the student cognitive capabilities specifically surrounding the students' own understanding of fruits, vegetables, consumption patterns, and cafeteria experience. While all students were in grades sixth to eighth, students' knowledge of healthy foods and healthy eating wasn't measured before the interviews. Future researchers can benefit from finding a way to better understand the students' previous knowledge surrounding their cafeteria experience.

Social desirability bias is also a limitation within this study. Students may have wanted to share more healthy options or better sounding food and drink with the researcher as they may have wanted their selections and consumption habits to sound "more healthy" or "better." The researcher tried to negate this by building a comfortable atmosphere for the interviewee, but this bias may have still existed. Future research should take into account the social desirability bias that can exist especially around food consumption and selection. Finding ways to deepen question stems and probing questions will be important when trying to lessen this bias as much as possible for interviewees.

Finally, the researcher has not had much experience in qualitative interviewing. While the researcher has taken the appropriate amount of coursework and training, this is the interviewer's first official qualitative study. The researcher's lack of skill in interviewing could have influenced some of the interviewees' responses through the inexperience of questioning and probing. While this is appears to be a minor limitation, it is something that the researcher has been aware of while conducting this study.

This research design's mixed-method approach has sought to better understand the student experience in the NSLP. Though this innovative approach to gaining "ground-level" student experience data through quantitative observations and qualitative interviews with students this research addresses two substantial gaps in the literature. While this research design does also present some limitations, this ambitious design paves the way forward in which future research can be strengthened by minimizing the limitations that were seen throughout this dissertation.

Scholarly Contributions

Childhood obesity has continued to be a major health issue in the United States (Pulgarón, 2013; Ward et al., 2017). Among industrialized nations, the United States exhibits the highest rate of obese and overweight children with nearly one-third of American 15-year-olds recently reporting being overweight or obese (OCED, 2017). The consequences of these trends appear to be severe. Being obese in childhood is associated with lower academic achievement and attainment (Datar et al., 2004; Gurley-Calvez & Higginbotham, 2010); increased likelihood of disease and physical health problems (Pulgarón, 2013; Ward et al., 2017); and reduced economic productivity in later life (Wolfenstetter & Wenig, 2012). Officials have even argued that childhood obesity represents a major threat to national security (Popkin, 2011).

To decrease childhood obesity, schools have been an important setting for intervention efforts (Ward et al., 2017). The largest school-based nutrition intervention in the United States is the NSLP, which serves nearly 30 million low-income students, amounting to approximately 60% of all students in the public education system (U.S. Department of Agriculture and Nutrition Services, 2018). This study used a mixed-methods approach to determine the effectiveness of the NSLP through quantitative and qualitative analysis of student food selection and consumption in the cafeteria.

The findings of this research address two gaps in the literature. The first gap is a new and innovative approach to collecting consumption data in the cafeteria. This was done through the creation of a new data tool that more accurately diagnosed what students were selecting and consuming in the cafeteria than did previous studies (Cullen & Watson, 2009; Robson et al., 2000). The quantitative data offers policy makers, school leaders, and researchers' "ground level" data specifically centered on student selection and consumption trends. The results in the

quantitative study do not point to a complete failure of the NSLP. Rather, the school-level consumption data collected in the quantitative portion of this research offers other researchers and policy makers new insights into what students are consuming in the cafeteria and can serve as a tool to help improve the program's outcomes.

The findings in the qualitative interviews with students also address a relatively sizeable gap in the literature in offering policy makers, school leaders, and researchers the student perspective of the NSLP cafeteria experience. While the sample size of the interviews with students is not generalizable to the middle school population as a whole, this portion of the research sought to gain the student perspective surrounding the NSLP. The student perspective that was gained through this research can give researchers a greater glimpse into the student experience in NSLP along with potential solutions or interventions that can be used to strengthen the outcomes of the NSLP.

Through this research, both the quantitative study and qualitative study offer policy makers, researchers, and school leaders a new perspective into how the NSLP is experienced at the school level by providing real-time consumption data along with qualitative student interviews. While both the quantitative study and the qualitative study highlight areas of growth for the NSLP, this research as a whole does not negate the ambitious goals that the NSLP sets for students. However, this research offers a new perspective directly from school cafeterias and directly from participants of the program. This research can be used to help enhance the NSLP through its insight into what students are selecting and consuming in cafeterias and why those choices are being be made.

Areas for Future Research and Questions for School Lunch Policy

The mixed-methods design of this research study allowed the researcher to gain both a quantitative and qualitative understanding of school lunch selection and consumption. However, there remain areas in which this research can be expanded. The first is through using the quantitative design to observe other cafeterias in other parts of the country. While this research design took an innovative approach in trying to better comprehend students' selection and consumption habits, the data tool used in this study can be replicated, relatively easily, across other school sites. Increasing the number of student observations across various cafeterias is an area in which this research can be expanded to increase the generalizability of findings.

The next area of focus for future research should be centered on better understanding student consumption within the NSLP. This study sought to address this gap in literature because few studies on school lunches have sought to better comprehend what students are consuming in cafeterias across the country. While states monitor compliance to the NSLP these measures include what is being offered and served to students rather than what is being consumed by students. Continuing to research consumption patterns in cafeterias across the country can help policy makers gain a greater insight what students are not only selecting but also choosing to consume during lunches.

Another area of focus for future research should be centered on gaining the student perspective of the NSLP as few studies have chosen to gain the perspective of the participants of the NSLP. Future research can provide valuable insight into how the participants experience the program. Gaining the student perspective can help policy makers and school leaders understand how the participants of the program experience the policy as a whole.

Finally, dieticians and researchers should closely examine the choices offered in cafeterias. Data from the quantitative study and qualitative study suggest that students may not be fully consuming their milk or their vegetables. Gaining a greater insight, from a dietary perspective, the implications that this pattern could have for some of the country's most vulnerable students is an important next step for future research.

This mixed-method research design addressed two gaps in the research surrounding the NSLP. This research design set out to better understand what students were both selecting and consuming in the cafeteria by carefully measuring the nutritional intake that these selection and consumption choices had for students. The researcher also interviewed 20 (*n = 20*) students to better understand the student perspective surrounding the NSLP. While both of these studies point to areas of growth in the NSLP, this research, again, does not negate the importance of the policy. Ensuring that all students have access to quality, nutrient-dense foods is an important policy for the country's most vulnerable population. Yet using this research design and future research to better understand how the policy is implemented and the outcomes that this policy achieves is important as this policy affects close to 30 million students a day (Alfonso et al., 2019; Capograssi & You, 2015; Gundersen et al., 2012).

As researchers and policy makers continue to grapple with the childhood obesity epidemic that has plagued the United States, it is important that they find ways to better monitor and examine the outcomes of the NSLP. Currently, states determine their cycle of meal compliance under the NSLP while districts are monitored to be compliance with the NSLP meal patterns and nutritional standards (Interim Rule: Certification of Compliance with Meal Requirements for the National School Lunch Program Under the HHFKA of 2010, 2012). These compliance measures analyze what foods are being offered and served to students across school

districts but these measures do not monitor student's consumption habits or patterns. While the NSLP provides a strong policy to ensure equitable access to nutrient-dense food offerings, this research highlights the importance of being able to better understand both selected and consumed foods across the countries cafeterias. Using this research, policy makers may be able to find ways or tools to better measure the foods that are consumed in cafeterias throughout the United States.

This research also raises different questions for policy. For example, throughout this research it was found that students might not be consuming the most nutrient dense foods and rather, consuming foods with higher amounts of sugar. Policy makers can use this research to begin to think not only about new ways to measure the effectiveness of the NSLP but also different interventions that can be curated to ensure that students are eating more nutrient dense food options.

Utilizing the SCT policy makers and researchers can begin to understand, specifically from a health promotion standpoint, intervention methods that can be used to increase fruit and vegetable consumption in cafeterias. This research has shown that students are not eating the more nutrient dense foods in the cafeteria and offers suggestions that the presentation and lack of variety of some of the more nutrient dense items may play a part. Utilizing this research, policy makers and researchers can potentially curate intervention methods that target the more nutrient dense food options within the NSLP.

Throughout this research it also appeared that students threw away a high percentage of their food, specifically milk. Researchers and policy makers have an opportunity to discern the nutritional value that milk adds to the lunch and whether or not there are alternatives. Within the qualitative interviews with students, many students expressed that they enjoyed drinking water

and in some cases would prefer a water option in place of the milk option. Further research is needed to understand how the removal of milk or the substitution of milk within the NSLP requirements may affect students overall health outcomes.

This research also raises questions surrounding the taste and quality of food served within the NSLP. In the qualitative interviews with students, many students mentioned that one of the barriers to consumption was not only the presentation of the food, but also the taste or "lack" of seasoning. Policy makers and researchers can use this research to begin to think about the different alternatives that exist surrounding food preparation methods. These methods seem to be especially important in regards to the fruit and vegetable options that are available to students. More research is needed to better determine potential opportunities for this level of policy intervention.

Finally, this research also highlights the importance of using student voice to drive decision-making on food choices in the cafeteria. The SCT suggests that a student's previous knowledge or experience can influence their behavior. Gaining greater knowledge about what students are eating at home can be helpful for menu creators and policy makers. Also, this study found that many students did, in fact, understand what a healthy meal was. Yet the majority of students were continuing to select foods that were not as nutrient-dense as other offerings. Better examining, through the lens of the SCT, what students self-efficacy motives are can help to better inform healthy eating interventions across schools. If, in future research, researchers can better understand student self-efficacy as it relates to their eating behavior, various intervention programs targeted at families and cafeterias can be curated.

Conclusion

This research, while not generalizable to all middle school cafeterias, advances the literature surrounding the participants' experience within the NSLP. The lack of such research is a significant gap in the current landscape of student selection and consumption patterns within the NSLP. This research utilized a mixed-methods design to gain a greater insight into the students experience within the NSLP. First, this study used a real-time, innovative data tool to better capture what consumption patterns across middle school cafeterias looked like. Secondly, a qualitative study sought the perspectives of twenty NSLP participants.

Through this mixed-methods research design, it appears that there are areas of growth within the NSLP. One area of growth is situated around better understanding the student consumption patterns of the more nutrient-dense food options within cafeterias as it appears that students are not consuming these options at a high rate. Through this research design it also appears that students are not consuming their milk at a high rate. Future research is needed to understand the implications that students' lack of consumption of the more nutrient dense food options, including milk, can cause for students health. Next, this research found that students may be consuming higher amounts of sugar than the WHO recommendations. Finally, this research found a difference between what students are selecting to eat versus what they are consuming from their plate. This finding highlights the importance of not just monitoring for food selection compliance but also better monitoring student consumption habits in school cafeterias.

The qualitative interviews with students also found that students appear to be keenly aware of the presentation and taste of the foods that are being served in cafeterias. These students also offered suggestions and solutions on how to increase the taste and presentation of foods. The

qualitative interviews also highlighted that school menus may not be aligned or associated with the participants' food interests. Better comprehending what students are eating at home may offer insight to policy makers, dietitians, and menu creators on ways to bring a greater variety of nutrient-dense meals to cafeterias that students will consume. Further research is needed to better understand the student perspective and trends specifically centered on the students experience within the NSLP.

While the quantitative study and qualitative study both point to areas of growth for the NSLP, this research does not suggest that the NSLP should be vacated or abandoned. On the contrary, throughout the research for this study, the significance and importance of a federal meal program that serves over 30 million of some of the nation's most vulnerable students a year has been highlighted (U.S. Department of Agriculture and Nutrition Services, 2018). This research fits into the current body of work surrounding the NSLP by providing ground-level perspectives that can offer future researchers and policy makers a better sense of what is happening in cafeterias across the country. This research design also provides insight into how the participants of the NSLP experience the program in its entirety. This research not only highlights the importance of understanding what students have to select for lunch, but also moves toward a potential model that can give policy makers valuable information centered on what students are consuming from their selections. Moreover, this research identifies ideas, interventions, and solutions, through the participant experience, that may serve to enhance the efficacy of the program. Gaining a greater insight into how the NSLP is experienced by its participants and gaining a deeper understanding about what students are consuming from cafeterias daily will help to provide insight for future researchers and policy makers on how to continue to improve health outcomes for some of the nation's most vulnerable students.

Appendix 1A: Research Questioner

Research Questioner

Bullet points are probing questions.

Thank you for meeting with me today, [Student Name].

What's your favorite food?

- If you got to select one food to eat for lunch today, what would it be?
- Where is your favorite place to order this food?

How often do you get to eat this food?

What's your favorite drink?

- If you got to select one drink to drink for lunch today what would it be?
- Where is your favorite place to order this drink?

How often do you get to drink this drink?

When you're at home, what's your favorite food to eat?

- Where do you get this food from? What store/restaurant?

When you're at home, what's your favorite drink?

- Where do you get this drink from? What store/restaurant?

At school are you usually hungry when you go to lunch?

- Do you eat breakfast at school?
- Do you eat breakfast at home?
- Why are you hungry, or why aren't you hungry?

When you're at school, what is your favorite meal that is served?

- If you don't have a favorite, what do you typically get when you get lunch?

What is you're favorite drink that is served?

- If you don't have one, do you usually get a milk or juice? Why or why not?

Do you usually eat your whole lunch?

- Why or why not?

We've noticed that some students aren't eating their vegetables.

- Why do you think that is?
- Do you think students like the vegetables?
- Why or why not?

We've seen that some students aren't eating their fruit.

- Why do you think that is?
- Do you think students like the fruit?
- Why or why not?

Do you normally drink your milk?

- Why or why not?

Do you think students are eating healthy lunches at school?

- Why or why not?
- What do you think the healthiest lunch a student could eat at lunch would be?

What if the cafeteria only served white milk with a juice, salad, and apple for lunch?

- Would you eat this lunch?
- Why or why not?
- Do you think other students would eat this meal?
- Why or why not?

What would be your perfect lunch at school?

- What kind of meal would it be and what kind of drink?

Do you think that you eat healthy when you get a school lunch?

- Why or why not?

Appendix 1B: A-Priori Codes

A-Priori Codes

A-Priori Codes	Codes	Categories
Healthy Eating	Vegetables Fruit Carrots Apples Bananas Celery Salad Sandwich Orange Grapes Tomatoes Baked Chicken Rice Seafood	Student Healthy Eating Experience
Unhealthy Eating	Chips Takis Pizza Hamburger Cheeseburger Chicken Tenders Nachos Taco's Cookie Ice Cream Cake Candy	Student Unhealthy Eating Experience
Fast Food	Quick Trip McDonalds Little Cesar's Burger King Tasty Freeze Churches Chicken Popeye's Chicken Kentucky Fried Chicken Chick-Fil-A Taco Bell Wendy's Sonic Whataburger	Student Fast Food Experience

Table 1B cont'd.

Taste	It tastes good I doesn't taste good I don't like it I like it It's gross It's disgusting It tastes the best I love () I hate ()	Student Taste Experience
Food Quality	It's burnt It's soggy It's perfect It's too hard It's too soft It's old It's rotten It's ripe It's Mushy They cook it too long It's not cooked enough It's not real food	Student Food Quality Experience

Appendix 1C: Cafeteria Data Tracking Tool

Cafeteria Data Tracking Tool

Number	Gender	Milk	Juice	Meal Option	Side Option	Side Option
1	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
2	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
3	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
4	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
5	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
6	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
7	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
8	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
9	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
10	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F
Number	**Gender**	**Milk**	**Juice**	**Meal Option**	**Side Option**	**Side Option**
11	M F	W C S	Y N	P N CS	FF F	
		ND ½ E	ND ½ E	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F	NE ¼ ½ ¾ F

Appendix ID: Participation Consent

Signed Assent (Over 12) to Participate in Research

Would you like to be involved in research at the University of Oklahoma?

I am Rob Kaiser from the Education Administration Curriculum and Supervision Department, and I invite you to participate in my research project entitled, "Does the National School Lunch Program Foster Healthy Eating? A Mixed-Methods Analysis of Food Selection and Consumption in Middle School." This research is being conducted at the University of Oklahoma. You were selected as a possible participant because I saw that you had signed up to be a part of the study. Your guardian gave us permission to ask you to be in the study, but it is up to you.

Please read this document and contact me to ask any questions that you may have BEFORE agreeing to take part in my research.

What is the purpose of this research? The purpose of this research is to better understand what students are eating while they are in the cafeteria. We want to better understand why students choose to eat the foods that they do.

How many participants will be in this research? About 20 students will take part in this research.

What will I be asked to do? If you agree to be in this research, you will meet with me for 30 minutes to 1 hour on a Zoom call or in person where I will be asking you a variety of questions about you experience in the cafeteria.

How long will this take? Your participation will take 30 minutes to 1 hour on a Zoom call or in person.

What are the risks and/or benefits if I participate? There are no risks or benefits from being in this research.

Will I be compensated for participating? You will be reimbursed for your time and participation in this research. After the interview you will receive a $10 Amazon gift card.

Who will see my information? If we publish our research, there will be no information that will make it possible to identify you. Your answers/interviews will be stored securely and only our research team and the OU Institutional Review Board will have access to them.

Do I have to participate? No. If you do not participate, you will not be penalized. If you decide to participate, you don't have to answer any question you don't want to, and you can stop participating at any time.

Will my identity be anonymous or confidential? Your name will not be linked with your answers, so your answers are anonymous. Data are collected via an online platform not hosted by OU that has its own privacy and security policies for keeping your information confidential. Please note no assurance can be made as to the use of the data you provide for purposes other than this research.

What will happen to my data in the future? After removing all identifiers, we might share your data with other researchers or use it in future research without obtaining additional assent from you.

Audio Recording of Research Activities help us accurately record your responses. Your interview will be recorded on an audio recording device. You have the right to refuse to allow such recording without penalty.

I consent to audio recording.___ Yes___ No

Whom do I contact with questions, concerns, or complaints? If you have questions, concerns, or complaints about the research or have experienced a research-related injury, contact me at (918) 924-2730 or robkaiser33@ou.edu.

You can also contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu if you have questions about your rights as a research participant, concerns, or complaints about the research and wish to talk to someone other than the researcher(s) or if you cannot reach the researcher(s). *You will be given a copy of this document for your records. By providing information to the researcher(s), you are agreeing to participate in this research.*Participant Signature	Print Name	Date
Your Parent's Name	Print Name	
Signature of Researcher Obtaining Consent	Print Name	Date
Signature of Witness (if applicable)	Print Name	Date

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The UNIVERSITY of OKLAHOMA

Institutional Review Board for the Protection of Human Subjects

Human Research Determination Review Outcome

Date: January 07, 2020

Principal Investigator: Daniel E Hamlin

Study Title: Cafeteria Consumption: Food on Plate vs. Food Consumed.

Review Date: January 07, 2020

I have reviewed your submission of the Initial Submission Packet and study materials for the abovereferenced study. I have determined this research does not meet the criteria for human subject's research. The proposed activity does not involve capturing the child participant's identity and does not include collecting any data from the child participant. Therefore, IRB approval is not necessary so you may proceed with your project.

If you have questions about this notification or using iRIS, contact the HRPP office at (405) 325-8110 or irb@ou.edu. Thank you.

Cordially,

Aimee Franklin, Ph.D.
Chair, Institutional Review Board

The UNIVERSITY of OKLAHOMA

Institutional Review Board for the Protection of Human Subjects

Approval of Initial Submission – Expedited Review – AP01

Date: September 22, 2021 **IRB#:** 13544

Principal Investigator: Robert Kaiser **Approval Date:** 09/22/2021

Status Report Due: 08/31/2022

Study Title: Does the National School Lunch Program foster healthy eating? A qualitative analysis of food selection and consumption in middle school.

Expedited Category: 7

Collection/Use of PHI: No

On behalf of the Institutional Review Board (IRB), I have reviewed and granted expedited approval of the above-referenced research study. To view the documents approved for this submission, open this study from the *My Studies* option, go to *Submission History*, go to *Completed Submissions* tab and then click the *Details* icon.

Requirements under the Common Rule have changed. The above-referenced research meets one or more of the circumstances for which continuing review is not required. However, as Principal Investigator of this research, you will be required to submit an annual status report to the IRB.

As principal investigator of this research study, you are responsible to:

- Conduct the research study in a manner consistent with the requirements of the IRB and federal regulations 45 CFR 46.
- Obtain informed consent and research privacy authorization using the currently approved, stamped forms and retain all original, signed forms, if applicable.
- Request approval from the IRB prior to implementing any/all modifications.
- Promptly report to the IRB any harm experienced by a participant that is both unanticipated and related per IRB policy.
- Maintain accurate and complete study records for evaluation by the HRPP Quality Improvement Program and, if applicable, inspection by regulatory agencies and/or the study sponsor.
- **Submit an annual status report to the IRB to provide the study/recruitment status and report all harms and deviations that may have occurred.**
- **Submit a final closure report at the completion of the project.**

If you have questions about this notification or using iRIS, contact the IRB @ 405-325-8110 or irb@ou.edu.

Cordially,

Lara Mayeux, Ph.D.
Chair, Institutional Review Board