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Comprehensive Farm-to-School: A Mixed-Methods Case Study of the Classroom, Cafeteria, and Community

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COMPREHENSIVE FARM-TO-SCHOOL: A MIXED-METHODS CASE STUDY OF THE CLASSROOM, CAFETERIA, AND COMMUNITY

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ABSTRACT

Farm-to-school (FTS) programs are supported at federal, state, and local levels as a cross-sectoral intervention to curb rising levels of obesity, strengthen local food systems, and improve school climate and academic outcomes. Comprehensive FTS programming, according to the "3-C" approach embraced by leaders in the FTS movement, includes interventions in three domains: the cafeteria, classroom, and community. FTS programming in these domains may include procurement of local food; school gardens; and education related to food, agriculture, and nutrition. Existing research supports the comprehensive FTS approach, illustrating that multi-component programs with strategies that are integrated across these environments improve outcomes for students. FTS programs have potential impacts in the sectors of public health, economic development, education, and environmental sustainability, and they involve a diverse range of stakeholders including students, teachers, school leadership, food service staff, local farmers, and state and national policymakers. However, literature on FTS programs is largely in the areas of health behavior and nutrition outcomes for students, and further investigations of other aspects may lead to improved programming.

The three distinct papers in this dissertation represent an unsequenced descriptive case study, in which each article explores one of the three FTS domains. The case study methodology allowed for in-depth mixed-methods data collection about a bounded system using multiple sources of information. The case for this research was a school district in northern California with a comprehensive FTS program supported by partnership with a local non-profit partner. The first study examines the classroom through teacher involvement in FTS programming using qualitative methods. Social cognitive theory is used as a framework to understand factors that impact classroom teacher involvement and propose strategies to support teacher involvement in FTS. The second study examines the cafeteria through research of a new school lunch program connected to the district FTS programming. Through mixed-methods data collection and analysis, the second article examines the factors that supported a school district in overcoming the barriers to instituting healthier meal options as well as a broad range of student outcomes. The third study examines the community through a qualitative exploration of the relationships between schools, families, and community partners at the case study site. Specifically, it examines FTS programming as an avenue for community partner involvement and family engagement in schools.

This research may support teachers, administrators, and non-profit partners in improving comprehensive FTS programming. These studies fill gaps in the research around the three domains of FTS, particularly the classroom and community, and they may contribute to further studies that seek to explore and compare the different aspects of FTS that lead to outcomes for students and schools. Each chapter may also be a resource for researchers in the fields of food, agriculture, and nutrition education; curriculum innovation; school food; and community-school partnerships.

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CHAPTER 1

Since the growth of the school gardens movement in the 1990s and the first federally funded farm-to-school (FTS) programs in 2000, the number of FTS programs across the nation has grown in recent years (Feenstra & Ohmart, 2012; A Joshi, Henderson, Ratcliffe, & Feenstra, 2014). According to the United States Department of Agriculture (USDA) Farm to School Census, over 42,000 schools were involved in local food procurement, school gardening, and food and farm related education in 2015, reaching 23.6 million children (United States Department of Agriculture (USDA), 2017). FTS programs are supported at federal, state, and local levels as a cross-sectoral intervention to curb rising levels of obesity, strengthen local food systems, and improve school climate and academic outcomes (Ashe & Sonnino, 2013; Bagdonis, Hinrichs, & Schafft, 2009; Gorski, 2013; Anupama Joshi & Ratcliffe, 2012; Turner, Eliason, Sandoval, & Chaloupka, 2016; Vallianatos, Gottlieb, & Haase, 2004). Due to the recent birth of the FTS movement as well as significant local and regional variation in implementation, program outcomes have not been thoroughly researched or evaluated. However, research points to the potential for these interventions to impact the dietary, physical, curricular, and social environments at schools, with trends towards improved dietary, psychosocial, and academic outcomes for students (Anupama Joshi & Ratcliffe, 2012; Moss, Smith, Null, Long Roth, & Tragoudas, 2013; MS, MS, & RD, 2008; Taylor & Johnson, 2013; United States Department of Agriculture (USDA), 2017).

Comprehensive FTS programming includes schoolwide interventions in three domains: procurement of local food; school gardens; and education related to food,

agriculture, and nutrition (A Joshi et al., 2014). Existing research on health behavior interventions at schools supports the comprehensive FTS approach, illustrating that multi-component programs with strategies that are integrated across wider school environments improve outcomes for students including food preferences, knowledge, self-efficacy, and fruit and vegetable intake (Bandura, 2004; Evans, Coon, & Ume, 2011; Hazzard, Moreno, Beall, & Zidenberg-Cherr, 2011; Perry et al., 2004; Taylor & Johnson, 2013). Although the outcomes of comprehensive FTS programs have not been systematically reviewed, research on the different components of these programs—especially school gardens—points to a wide range of potential outcomes for students, schools, and communities.

The social ecological model has been used as a theoretical framework to organize potential student outcomes from FTS programming (A Joshi et al., 2014; Moss et al., 2013). This model describes health and well-being as shaped by intrapersonal, interpersonal, organization/institutional, community, and public policy contexts (Brofenbrenner & Morris, 1998). Research illustrates that comprehensive FTS programming has the potential to interact with each level of the social ecological model (A Joshi et al., 2014; Moss et al., 2013). At the student level, FTS programs may directly increase knowledge and skills in nutrition, science, agriculture, food literacy, and the environment (Heather Graham, Beall, Lussier, McLaughlin, & Zidenberg-Cherr, 2005; A Joshi et al., 2014; Anupama Joshi & Ratcliffe, 2012; Klemmer, Waliczek, & Zajicek, 2005; Morgan et al., 2010; "Schools Serving, Kids Eating Healthier School Meals," n.d.; D. R. Williams & Dixon, 2013). Paired with increased access to healthy foods and

physical exercise, these programs may improve overall health and well-being of students, leading to indirect effects on student academic performance and readiness to learn, especially for students from low-resource backgrounds ("Benefits of Farm to School," 2017; Burt, Koch, & Contento, 2017; A Joshi et al., 2014; Ozer, 2007). In addition, studies also point to psychosocial benefits for students (including personal responsibility, sense of belonging, and motivation) as well as increased cognitive skills (including inquiry, critical thinking, and communication) and experiential education opportunities, all of which further support student engagement and academic success (Blair, 2009; A Joshi et al., 2014; Ozer, 2007; Skelly & Bradley, 2007; D. R. Williams & Dixon, 2013).

At the level of schools, FTS programs may lead to changes in physical, curricular, and social learning environments including the development of school gardens, enhanced experiential learning opportunities, and hands-on group projects involving food or agriculture. Research shows that these types of changes may create avenues for students to connect with nature, foster peer relationships, develop a sense of school pride and community, and increase parental involvement in diverse families (A Joshi et al., 2014; Anupama Joshi & Ratcliffe, 2012; Ozer, 2007; Ratcliffe, 2007; Thorp, 2006; D. Williams & Brown, 2013).

As a researcher with an academic and professional background in the fields of public health and education, I am interested in FTS as an intervention that addresses the interconnected nature of health and education. In 2013, the intersections of health and education were articulated in the Whole School, Whole Community, Whole Child model (see Appendix for an image of the model), which was developed by public health and

education experts working through a partnership between the Centers for Disease Control and Prevention and the Association for Supervision and Curriculum Development. This model, described as "a collaborative approach to learning and health," emphasizes the connectedness between health and academic, social, and emotional outcomes for students (Lewallen, Hunt, Potts-Datema, Zaza, & Giles, Wayne, 2015). It describes how to create a school environment that supports health and learning by focusing on core areas including health education, nutrition environment, physical environment, and community involvement. In this model, the school is positioned as an integral part of the community, with an emphasis on multisectoral collaboration.

FTS programming exemplifies the underlying principles of the Whole School, Whole Community, Whole Child model by providing integrated programming in the areas of food, agriculture, and nutrition. FTS programs incorporate many of the model's key strategies including health promotion at the school level through hands-on health education; family engagement and community involvement; physical activity; and improved school nutrition services. Investigating FTS programming was an opportunity to explore an intervention that addresses the research-based connections between public health and education.

Defining FTS

At a broad level, FTS programs share the goals of improving childhood nutrition and supporting local markets (A Joshi et al., 2014; Roche et al., 2012). However, there is a great deal of diversity in local and regional program strategies that are developed to meet these goals, and FTS is defined in different ways across the research and program

evaluation literature. A primary definition used in this research was clarified by a foundational document in FTS literature, *Evaluation for Transformation* (A Joshi et al., 2014), which describes the potential outcomes of FTS and provides a common language for researchers, program evaluators, and practitioners. This document broadly describes FTS as enriching "the connection communities have with local, healthy food and food producers by changing food purchasing and educational activities at schools and preschools" (A Joshi et al., 2014, p. 2). Though FTS programs are unique and vary by location and school resources, **comprehensive** programs, according to this document, include three core elements: (a) procurement of local and regional food products, (b) gardening based at schools and preschools, and (c) education that is food and farm-related. This definition of comprehensive FTS has been adopted by the National Farm to School Network ("Benefits of Farm to School," 2017) and many local FTS programs. I use it in this study to define the case for the empirical research.

An additional definition that provides an organizing framework for the presentation of this research is the "3-C" approach embraced by leaders in the FTS movement, which defines three domains of intervention: the cafeteria, classroom, and community ("What is Farm to School? | Vermont FEED," n.d.). Although my original research proposal focused on the classroom domain of FTS, my research questions were extended through the iterative process of field research and data analysis, and I have organized my findings into three articles that investigate the three domains of FTS.

Emergent Research Design

Within a broader case study framework, data collection and analysis followed the qualitative mode of emergent design (Creswell, 2012), in which research questions and data collection were continuously informed by on-going research and analysis. As explained by Creswell (2012), this "means that all phases of the process may change or shift after the researchers enter the field and begin to collect data" (p. 39). While the broader case study design and specific research methodologies did not shift from my original research proposal, over the course of this project my research questions extended to include additional aspects of FTS programming.

Participant Observation. The iterative research process was not only informed by my own data analysis and reflection but also by an interactive approach to the research. I followed the participant observer model, in which the researcher becomes involved in some way in the context that they are researching (Creswell, 2012; Glesne, 2011). As a newcomer to my study site, I initiated a collaboration with the non-profit partner organization that supports FTS programming in the county in order to identify a case study site and access key informants. As research progressed, my informal relationship with the non-profit organization allowed me to familiarize myself with local FTS programming and history and led to unexpected research questions and opportunities. As I was collecting and analyzing data during the spring and fall of 2018, I concurrently worked as a volunteer for the non-profit organization. As a volunteer, I supported student programming at the educational farm, participated in garden

installations, and conducted a preliminary evaluation to assess outcomes of a new school lunch program.

Research Questions

The three distinct papers in this dissertation represent an unsequenced descriptive case study (Yin, 2014), in which each article explores one of the three FTS domains: the classroom, cafeteria, and community. The first study uses qualitative methods to examine the classroom domain through research on teacher involvement in FTS programming. Social cognitive theory is used as a framework to understand factors that impact classroom teacher involvement and to propose strategies to strengthen this area of programming. The second study examines the cafeteria domain through research of a school lunch program connected to the site's FTS programming. Using mixed-methods data collection and analysis, the article examines the factors that supported a school district in overcoming the barriers to instituting healthier meal options and discusses a broad range of student outcomes. The third study examines the community domain through a qualitative exploration of the relationships between schools, families, and community partners at the case study site. Specifically, it discusses the role of a community partner in FTS programming.

The articles therefore address a number of research questions:

Article 1: Social Cognitive Theory as a Framework for Supporting Classroom Teacher Involvement in Farm-to-School Programming

1) How do key stakeholders (teachers, school administrators, parents, and non-profit partners) view the involvement of classroom teachers in the context of comprehensive FTS programs?
2) How do personal cognitive, environmental, and supportive behavioral factors impact teacher involvement in FTS programming?
3) Which strategies, based on SCT, may strengthen teacher involvement in FTS?

Article 2: Farm-to-School in the Cafeteria: Outcomes for Students and School Community

(4) What factors supported the school district in developing and implementing a new school food program?
(5) What were the preliminary outcomes for students connected to the new lunch program during the first year of implementation?
(6) Were there changes to other school food indicators, including adult participation and food waste?

Article 3: Community Involvement and Family Engagement in Farm-to-School

(7) What is the nature and extent of community partner and parent involvement in FTS programming?
(8) What factors strengthen community partner and parental involvement in FTS programming?

Yin (2014) outlines several structures for case study compositions. As a whole, this dissertation follows the unsequenced structure, in which the chapters each represent different aspects of the case study research. The sequencing of the topics within the

dissertation—from classroom to cafeteria to community—follow the framework of the social ecological model by starting at a proximal level and moving to more distal levels of contextual influence (Brofenbrenner & Morris, 1998).

Research Design and Methods

Case Study Approach

According to Creswell (2012) and Yin (2014), the case study approach allows for in-depth description of a contemporary, complex social phenomenon within its real-world context. Yin (2014) further explains that the case study method is most fitting to answer research questions that ask "how" or "why" about a contemporary situation. In other words, this method fits questions that look to a more complex and integrated understanding, such as the personal and environmental factors that shape teacher engagement and facilitation of FTS.

The case study methodology describes an approach in which the researcher gathers in-depth, detailed data about a bounded system through multiple sources of information. I conducted a single instrumental case study (Creswell, 2012), which allowed me to richly describe FTS programming in one bounded case without the potential confounding caused by multiple program strategies across different school and community environments. For this research, the case was a small school district in northern California that has a high-performing, comprehensive FTS program supported by partnership with a local non-profit organization. I chose to conduct research in a district with comprehensive FTS programming—including local food procurement, school garden opportunities, and education related to food, agriculture, and nutrition—for

two reasons. First, schools with comprehensive programming were more likely to provide a greater depth of information about a range of research questions, including different types of programming as well as research participants with interest and experience in FTS. Second, my interest in FTS is as a strategy to strengthen student outcomes through the multi-component effect of comprehensive interventions. A non-profit partnership was essential to the case selection, because it allowed me to include data collected from key stakeholders at the community level.

Data Collection

As discussed by Creswell (2011 and 2012) and Yin (2014) the various sources of data collection typical of case studies are highly complementary, and a strong case study relies on multiple sources of evidence. For this research, I collected data through (a) semi-structured interviews, (b) document review, (c) direct observation, and (d) lunch numbers data.

Semi-structured interviews. The in-depth interview is one of the fundamental sources of evidence in case study designs (Creswell, 2012; Yin, 2014), as most case studies are about human phenomena. I followed the model of shorter case study interviews, in which interviews were composed of open-ended questions that follow a structured protocol and last no longer than an hour (Yin, 2014). I followed the shorter interview model to align with the scheduling constraints of the research participants, including teachers, school principals, and food service staff.

My initial research contacts were the FTS Director and Co-Director of the non-profit partner organization, who provided information about district FTS programming

and facilitated contact with school leadership. I used the snowball method (Collins, 2010) to access other key informants, including parents, teachers, and food service staff. A stratified purposeful sample was used to organize the sample, including informants from the strata of teachers, school administrators, parents, food service staff, and staff at the non-profit partner organization (Collins, 2010; Creswell, 2012; Yin, 2014). Similar to Hazzard et al.'s (2011) study, the criteria for choosing individuals was a high level of involvement in FTS programming, as described by the non-profit partner organization or school administration.

Purposive sampling schemes are used to strategically choose interview participants to yield a depth of information and important perspectives to the phenomenon of interest (Collins, 2010; Miles & Huberman, 2014). Interviews with teachers, school leaders, parents, and non-profit staff that work closely with the FTS programming provided rich information about the contextual influences and diverse perspectives at the heart of my research questions. Due to the difficulty with accessing particularly teachers as interview participants, I depended on teachers to volunteer, which could potentially bias the sample. However, triangulating data among the other stakeholder groups made me confident in the themes that arose from the variety of interviews.

According to Creswell (2012), minimal sample size recommendations for case study designs are 3-5 participants. Following this recommendation, I attempted to interview at least 3-5 individuals in each strata of my sample – teachers, school administrators, parents, and non-profit partner staff. The sample for Articles 1 and 3

consisted of a total of nine stakeholders from the elementary school in the district: three teachers, the school principal, two parents, and three non-profit staff members. Interview protocols for this sample included questions about stakeholder roles in FTS, teacher involvement, and student outcomes connected to the new school lunch program. In Article 2, I include data from an additional ten interviews conducted at the elementary and middle school in the district. These additional interviews included the following stakeholders: two food service staff, one principal, three teachers, and two parents. The interview protocol for these additional interviews was shorter, as it only focused on student outcomes connected to the new lunch program. Table 2.1 summarizes the data collected.

Table 2.1
Data Collection Summary

	Article 1	**Article 2**	**Article 3**
FTS Domain	Classroom	Cafeteria	Community
Research Questions	▪ How do key stakeholders view the involvement of classroom teachers in the context of comprehensive FTS programs? ▪ How do personal cognitive, environmental, and supportive behavioral factors impact teacher involvement in FTS programming? ▪ Which strategies, based on SCT, may strengthen teacher involvement in FTS?	▪ What factors supported the school district in developing and implementing a new school food program? ▪ What were the outcomes for students connected to the new program? ▪ Were there changes to other school food indicators including adult participation and food waste?	▪ What is the nature and extent of community and parent involvement in FTS programming? ▪ What factors strengthen community and parental involvement?
Methods	Qualitative	Mixed Methods	Qualitative
Study Site	Oakvale Elementary School	County School District: Oakvale Elementary School and Hills Middle School	Oakvale Elementary School
Data Collection	▪ Interviews ▪ Document Review	▪ Interviews ▪ Document Review	▪ Interviews ▪ Document Review

	▪ Direct Observation	▪ Direct Observation ▪ Lunch Numbers Data	▪ Direct Observation
Interview Participants	▪ 3 Teachers ▪ 1 School Principal ▪ 2 Parents ▪ 3 Non-profit Staff	▪ 2 Food Service Staff ▪ 2 School Admin ▪ 2 School Principals ▪ 6 Teachers ▪ 4 Parents ▪ 3 Non-profit Staff	Same sample as Article 1
Interview Protocols	▪ Stakeholder roles ▪ Classroom teacher involvement in FTS ▪ Student outcomes with new lunch program	▪ Student outcomes with new lunch program	Same protocols as Article 1

I recorded all interviews for subsequent transcription and analysis. Each interview was followed by a memo to document immediate impressions, notable information, and ideas that emerged (Miles and Huberman, 2014).

Document Review. Document review focused on three types of archives: school reports that document wellness policies; school newspaper or other community-wide communications that document FTS efforts at the school; and programmatic reports from the non-profit organization. As recommended by Yin (2014), these documents were used to corroborate and augment information from the interviews. I did general and detailed readings of the documents, then coded the documents using a code book developed through the analysis of interview data (Creswell, 2012; Miles and Huberman, 2014).

Direct Observation. Direct observation of the FTS programming supported a contextual understanding of the research questions, provided immersion as a qualitative researcher, and allowed me to triangulate data from the interviews and document review (Creswell, 2012; Yin, 2014). Over the course of a spring and fall semester, I observed many aspects of the FTS programming in the district, including farm visits, Harvest of the Month, guest chef classes, and farmer visits. In total, I conducted observations during

12 different FTS activities. Field notes from the observations were also reviewed and coded.

Lunch Numbers Data. Article 2 includes collection and analysis of a fourth data source: lunch numbers data from the two participating schools and from the school district. Lunch numbers data included school-level lunch counts for several months from the 2016/2017 and 2017/2018 academic cycles, which showed the daily number of full-pay, free and reduced-priced, and adult lunches ordered. Lunch numbers data also included district-level lunch counts, which combined meals served from both the elementary and middle schools for a span of the previous five years and showed monthly full-pay, free and reduced-priced, and adult lunches ordered.

Data Analysis

Data analysis is covered in detail in each chapter. In summary, the qualitative data analysis for Articles 1 and 3 followed a process of abductive coding to create a code book, followed by pattern coding to uncover themes from the semi-structured interviews, document review, and direct observations (Creswell, 2012; Miles, Huberman, & Saldaña, 2014; Onwuegbuzie & Combs, 2010; Saldaña, 2013). To strengthen the accuracy and consistency of the coding, a process for reaching inter-coder reliability and inter-coder agreement was followed (Campbell et al., 2013). A colleague familiar with the research topics read approximately 10 percent of my total transcripts selected at random and coded them based upon my codes and code descriptions. I then discussed any coding discrepancies with the colleague and came to full agreement on the codes (Campbell et al., 2013). This process was particularly helpful in refining codes around school culture.

I used NVivo software to code data and develop themes across the different data sources. Article 2, following a mixed-methods model, included descriptive statistics and statistical significance testing based on lunch numbers data.

Validity Issues

I employed various conventional strategies to increase the validity, transferability, and trustworthiness of qualitative research (Creswell, 2012; Glesne, 2011; Miles and Huberman, 2014). The use of multiple sources (interviews, observation, and document analysis) provided a triangulation of data, leading to more accurate and detailed information. During the process of data analysis, I followed a process for reaching inter-coder reliability and inter-coder agreement to strengthen the accuracy and consistency of my coding (Campbell, Quincy, Osserman, & Pedersen, 2013). I include explicit description of my research purpose as well as descriptive prose in each chapter to allow the settings and participants to speak for themselves. Finally, throughout the data collection and analysis processes I attempted to acknowledge my bias as a researcher with prior engagement in the fields of education and public health.

Yin (2014) translates the traditional criteria for evaluating the quality of research designs to case study research. He explains the strategies that can be used in case study research to increase construct validity, external validity, and reliability. To increase construct validity—identifying correct operational measure for the concepts under study—Yin (2014) recommends the use of multiple sources of evidence as well as a review by key informants of a draft of the case study report. To enhance construct validity, I shared initial findings with key informants to clarify my interpretation and

refine on-going analysis. To increase external validity—defining the domain to which a study's findings can be generalized—Yin (2014) recommends the use of theory in single-case studies. Articles 1 and 3 are based on conceptual frameworks that were applied during the data interpretation phases.

Finally, Yin (2014) describes two strategies to increase reliability—demonstrating that the study operations could be repeated with the same results. To minimize errors and reduce bias in the study, I followed Yin's (2014) recommendation to use a case study database to organize and record field notes, case study documents, tabular materials created from the quantitative observation data, and narrative compilations generated from the qualitative data analysis. Establishing a "chain of evidence" in this manner is an additional strategy to increase case study reliability (Yin, 2014).

In her discussion of approaches to the validity debate surrounding qualitative research, Angen (2000) offers an "interpretive reconfiguration" that provides an alternative model that is both relevant and formative to this research. Instead of turning to conventional criteria used to reduce subjective bias, Angen (2000) proposes broader ethical and substantive bases for validation. The "craftsperson" skilled in the art of research, she argues, promotes an equal representation of all voices and considers, in all stages of the research process, an integration of personal bias and understandings with knowledge and theory derived from other sources. Ethically valid research is, above all, judged by its usefulness and focus on providing practical and pragmatic findings that inform/transform action. Furthermore, studies are "generative," encompassing new interpretations built upon the integration of representative data collection and integrated

data analysis. This dialogue articulates my own personal approach to research, and I have attempted to meet the standards of Angen's validation framework through my choice of research and the application of findings to current programming that has the potential to create a richer learning environment leading to the development of the "whole" student (Ratcliffe, 2007).

Study Site and Context

The case study site for this research was a small school district with a comprehensive FTS program in northern California. California has pioneered the FTS movement since the early 2000's at the levels of state support, non-profit leadership, and networks of diverse stakeholders (Feenstra & Ohmart, 2012). California State Superintendent of Public Instruction, Delaine Eastin (1995-2003), set the stage for strong statewide support for school gardens by calling for "a garden in every school" in the late 1990s (Ozer, 2007). This catalyzed state legislation that reserved small start-up funds for schools to develop instructional gardens. State support paired with other conditions in California—including the year-round growing season, robust community of small farmers, and leadership connected to the local food movement—led to rapid expansion of FTS programs (Feenstra & Ohmart, 2012). Superstars in the FTS movement emerged in northern California districts, including The Edible Schoolyard in Berkeley, developed by the Chez Panisse Foundation and the Center for Ecoliteracy ("Our History | The Edible Schoolyard Project," n.d.). The California Farm to School Network, which became a platform for statewide FTS efforts in 2013, is transitioning this year to the California

Department of Food and Agriculture Office of Farm to Fork ("About | The California Farm to School Network," n.d.).

The research was conducted at a school district that I refer to as Mountain City School District. The district is composed of an elementary school (referred to as Oakvale Elementary) with 417 students and a middle school (referred to as Hills Middle School) with 381 students. According to the California School Dashboard, 40.6% of Oakvale Elementary and 39.9% of Hills Middle students are socioeconomically disadvantaged (compared to 60.5% at the state level), which means that they are eligible for free and reduced-priced meals and/or have a parent or guardian who did not graduate from high school ("California School Dashboard," n.d.). The district is located in a rural, ethnically homogenous county with a population of about 100,000 people ("U.S. Census Bureau QuickFacts," n.d.). According to a 2017 Supplemental Nutrition Assistance Program county profile (USDA SNAP-ED, n.d.), 34% of children ages 6-17 in the county live at or below 185% of the national poverty level. 23% of children in the county are food insecure, and 48% of students in the county are eligible for free and reduced-priced lunch. On par with the national averages, 55% of adults and 20% of children in the county are overweight. Only 37% of SNAP recipients in the county report being able to access fresh fruits and vegetables in their neighborhood, and only 41% of children ages two through eleven consumed the recommended five servings of fruits and vegetables when surveyed.

Both schools partner with a non-profit community organization, which I refer to as FarmWorks, to offer FTS programming. For the past 10 years, FarmWorks has worked

to connect county families to fresh, local foods. Programs include training for aspiring farmers, a farm-based summer camp for children, a gleaning program, regional farm potlucks, and a garden installation program for low-income families and local public service organizations. FarmWorks' FTS program currently works with 27 K-8 schools in the county to increase opportunities for students to taste and have hands-on experiences with local fruits and vegetables. In order to participate in FTS programming, schools pay a flat rate of $2/student each year to FarmWorks. As this fee does not cover total program costs, the majority of funding comes from grants including a large grant from the California Department of Food and Agriculture.

The FTS programming at Oakvale Elementary is composed of a number of strategies to increase students' access to fresh fruits and vegetables and hands-on experience with food, agriculture, and nutrition. Programming includes the following components: Harvest of the Month program; farm field trips to partner farms; farmer visits with hands-on agriculture-related activities; a school orchard; a guest chef program in which community members prepare a meal with students using local ingredients; an annual plant sale fundraiser; a fall garden cart; and a new scratch-cooked lunch program that incorporates procurement of local fruits and vegetables. Because this site involves programming in local procurement, school gardening, and hands-on education related to food, farm, and agriculture, it can be considered a comprehensive FTS program.

Significance

At a practical level, these studies contribute to program improvement, as FTS programs have the stated goal of integrating multi-component strategies to improve

student outcomes (Feenstra & Capps, 2014; Heather Graham et al., 2005). By investigating the classroom, cafeteria, and community domains of FTS programming, this research can support teachers, administrators, and non-profit partners in improving comprehensive FTS programming. It is also valuable for researchers in the fields of environmental education, curriculum innovation, and community-school partnerships, as well as those who seek to explore and compare the different aspects of FTS that lead to outcomes for students and schools.

CHAPTER 2

Social Cognitive Theory as a Framework for Supporting Classroom Teacher Involvement in Farm-to-School Programming

Introduction

Since the growth of the school gardens movement in the 1990s and the first federally funded farm-to-school (FTS) programs in 2000, the number of FTS programs across the nation has grown to over 42,000 schools involved in local food procurement, school gardening, and food and farm-related education in 2015 (Feenstra & Ohmart, 2012; A Joshi et al., 2014; United States Department of Agriculture (USDA), 2017). FTS programs are supported at federal, state, and local levels as a cross-sectoral intervention to curb rising levels of obesity, strengthen local food systems, and improve school climate and academic outcomes (Ashe & Sonnino, 2013; Bagdonis et al., 2009; Centers for Disease Control and Prevention (CDC) and Bridging the Gap Research Program, 2014; Gorski, 2013; Anupama Joshi & Ratcliffe, 2012; Turner et al., 2016; Vallianatos et al., 2004).

Comprehensive FTS programming, according to the "3-C" approach embraced by leaders in the FTS movement, includes interventions in three domains: the cafeteria, classroom, and community ("What is Farm to School? | Vermont FEED," n.d.). FTS programming in these domains may include procurement of local food; school gardens; and education related to food, agriculture, and nutrition (A Joshi et al., 2014). Existing research on health behavior interventions at schools supports the comprehensive FTS approach, illustrating that multi-component programs with strategies that are integrated

across these environments improve outcomes for students including healthier food preferences, increased nutrition knowledge, self-efficacy, and fruit and vegetable intake (Hazzard et al., 2011; Perry et al., 2004; Taylor & Johnson, 2013).

Although teachers are key FTS actors and classroom-based education related to food, agriculture, and nutrition is a fundamental aspect of comprehensive, multi-component FTS programming in schools, the role of classroom teachers has not been thoroughly examined in the context of FTS (A Joshi et al., 2014). No recent studies focus on the role of classroom teachers in FTS programs, though their involvement and support strengthen FTS programs in key areas. Classroom teacher involvement in FTS can include integration of food, agriculture, and nutrition education in the classroom curriculum; role modeling of healthy behaviors; support of student learning in the garden, farm, or cafeteria; and development of FTS programming (Carbone et al., 2016; MS et al., 2008). Furthermore, the perspectives of classroom teachers have rarely been included in the FTS literature.

The activities that are the foundation of FTS programs have potential impacts in the sectors of public health, economic development, education, and environmental sustainability, and they involve a diverse range of stakeholders including students, teachers, school administrators, food service professionals, local farmers, and state and national policymakers. However, recent literature on the impacts of FTS programs is largely in the areas of public health and nutrition outcomes for students, while other aspects of FTS have not been well-researched (A Joshi et al., 2014). This paper responds to several gaps in the literature: (a) research in schools with comprehensive FTS

programs, (b) research on the classroom domain of FTS, and (c) research that documents the teacher perspective in FTS programs. In general, the role of classroom teachers in FTS has only been examined through quantitative measurements of increased teacher participation in school meal programs as more local fruits and vegetables have been incorporated through FTS programming (Izumi, Alaimo, & Hamm, 2010a; A Joshi & Azuma, 2008; MS et al., 2008). Through a broader, theory-based perspective on the role of teachers in FTS, this research will help identify the most significant factors that impact teacher involvement in FTS programs, which research suggests is a key aspect of improving student outcomes for FTS.

The Role of the Classroom in FTS Programming

Although FTS programs are unique and vary by location and school resources, comprehensive programs usually include three core elements: (a) procurement of local and regional food products, (b) gardening based at schools and preschools, and (c) education that is food and farm-related ("Benefits of Farm to School," 2017). A stated goal of FTS programming is that "students learn where their food comes from and the value of healthy eating through didactic and hands-on learning opportunities" (Vermont Department of Health, 2018, p. 7). In this model, food, agriculture, and nutrition learning is integrated into the overall classroom curriculum.

Although integration of food, agriculture, and nutrition education is a primary goal of FTS programming, research shows that this area may be one of the most challenging for schools. A recent survey of FTS programming at schools in Vermont (N=171) examined levels of integration in five FTS areas: kitchen infrastructure, local

food purchasing, faculty and staff engagement, community engagement, and curriculum. Findings from the survey showed that curriculum was the most challenging area of integration for schools, with 38% of schools reporting no activity in this area (Vermont Department of Health, 2018). Only 36% of schools agreed/strongly agreed that FTS learning activities were incorporated in the overall curriculum as part of the school's learning priorities. Half of surveyed schools reported that none or few teachers were incorporating FTS learning into classroom lessons or units. For teachers that did incorporate FTS themes in the classroom curriculum, the most common subject areas for integration were Health/Family and Consumer Services, Cafeteria/Nutrition Services Program, and Science.

Although teachers have a fundamental role in comprehensive FTS programming, few existing studies examine the role of classroom teachers in FTS. In addition to facilitating the incorporation of food, agriculture, and nutrition education in the academic curriculum, there are other potential areas for FTS involvement. Based on the existing research of classroom teacher involvement in FTS and school-gardening programs, Figure 2.1 outlines the primary areas of potential classroom teacher involvement in FTS programming.

Logistics Logistical and behavior management support during pre-programmed FTS activities	**Modeling** Modeling health behaviors related to food, agriculture, and nutrition
Program Development Developing FTS infrastructure (school gardens, relationships, curriculum)	**Curriculum Integration** Incorporating food, farm, and nutrition education in the academic curriculum

Figure 2.1. Potential roles of classroom teachers in FTS programming.

At the most basic level, teachers coordinate or support the logistics of FTS programming, including farm field trips or garden-based lessons. In other programs, teachers work to establish and maintain school gardens, build relationships with parent volunteers and garden coordinators, and enhance the quality of garden or farm-based learning through classroom instruction (Carbone et al., 2016; Hazzard et al., 2011; Jorgenson, 2013; Thorp, 2006). Teachers may also act as role-models by engaging students in healthy food preparation and modeling healthy eating (Carbone et al., 2016). In a comprehensive FTS program, teachers incorporate food, agriculture, and nutrition education in the classroom, either by creating their own curriculum or using established standards-based curriculums that connect hands-on learning in the farm or garden with academic learning in the areas of science, nutrition, environmental studies, language arts, math, or agricultural studies (Graham and Zidenberg-Cherr, 2005).

The exploration of teacher involvement in this paper is grounded in a theoretical framework that shapes the interpretation of factors that may impact the nature and extent of teacher involvement as well as the important role of teacher involvement in strengthening student outcomes.

Theoretical Framework

Theoretical frameworks orient and organize research in studies that concern complex and multidimensional human behaviors, in this case teacher involvement in FTS programming (Evans et al., 2011). The conceptual framework for this paper is built on two theories that have been used extensively in research around public health and education interventions: social cognitive theory and the social ecological model. Both theories describe the interplay of factors that influence, support, and constrain an individual acting within a broader context. Together, these theories provide a comprehensive model to help explain and disentangle the complex factors that may influence teacher involvement in FTS. In the field of FTS, Ratcliffe (2007, 2012) has previously modeled the use of these two theories in combination to describe how food and garden-based education may directly or indirectly impact student outcomes. Although I do not directly apply Ratcliffe's model to this work, it provides an example of merging the two theories

In this paper, social cognitive theory (SCT) is used as an individual-level theory to understand and describe the factors that impact the role of classroom teachers and their involvement in FTS programming. This theory revolves around the concept of reciprocal determinism, which explains how behaviors are influenced by three levels of determinants that are dynamic and constantly interacting: (a) personal cognitive, (b) environmental, and (c) supporting behavioral (Bandura, 1986; Glanz, Rimer, & Viswanath, 2015). Personal cognitive influences act at the intrapersonal level to shape

how an individual adopts and sustains a behavior. Key constructs in this area include the following:

- Self-efficacy: An individual's confidence in his/her ability to perform a behavior; enhanced by mastery experiences, social support/reinforcement, and emotional response.
- Collective efficacy: A group's belief in its ability to perform concerted actions and achieve an outcome.
- Outcome Expectations and Social Responses: Expectations about the consequences of engaging in the target behavior; social responses include approval, disapproval, and admiration.
- Knowledge: The individual knows the significance and components of the behavior and has the skills to perform the behavior.

Environmental influences act at the interpersonal level to shape self-efficacy and motivation for engaging in a target behavior. These aspects of the perceived or physical environment promote, permit, or discourage engagement:

- Observational Learning: An individual learns new information and behaviors by observing the behaviors of others.
- Normative Beliefs: Beliefs about the social acceptability and perceived prevalence of the behavior.
- Social Support: Relationships promote and protect an individual's well-being; includes esteem, informational, and instrumental support.

Finally, the following supportive behavioral factors are described as an antecedent to behavior:

- Intentions and Goal Setting: Internal standards for behavior; include positive outcome expectations.
- Reinforcement: Occurs when a response is given to a person after he/she performs a task, positive or negative

In the literature, SCT is often applied as an "action-oriented" approach to understand the personal and environmental influences on behaviors in order to create theory-based interventions (Glanz et al., 2015). In this article, I use SCT as a tool to explore the factors that may impact a behavioral outcome—in this case teacher involvement in FTS programming—in order to explore strategies to encourage and support increased teacher involvement.

SCT clarifies the role of personal and environmental factors in shaping behavior, and it has often been used as a framework to design and evaluate public health and nutrition interventions in the context of schools (Banning, 2015; Berlin, Norris, Kolodinsky, & Nelson, 2013; Hall, Chai, Koszewski, & Albrecht, 2015; Knobloch, 2008; Morgan et al., 2010; Morris, Briggs, & Zidenberg-Cherr, 2002; Wechsler, Devereaux, Davis, & Collins, 2000). By understanding the determinants that impact a target behavior, such as student dietary choices or teacher engagement in curriculum integration, SCT can be used for targeted program development, improvement, and evaluation. For example, Roche et al. (2012) apply the constructs of SCT to the context of FTS in Vermont to identify the impact of FTS programming on students' dietary behavior. The authors use

validated tools to quantitatively measure constructs of personal cognitive and environmental factors in the sample student population. By identifying associations between these factors and levels of student fruit and vegetable consumption, the authors discuss the impacts of FTS programming on the desired outcome of increased fruit and vegetable consumption. Finally, they suggest practical implications for FTS practitioners.

Although the focus and research methodology are distinct in my proposed study, I use SCT in a similar fashion: as a tool to explore the personal and environmental factors that may impact a desired behavioral outcome, in this case teacher involvement in FTS. This research uses in-depth qualitative data to (a) understand how personal cognitive, environmental, and supportive behavioral factors interact to shape teacher involvement; and (b) to identify strategies that may support increased teacher involvement. This leads to a discussion of practical implications for FTS practitioners and program developers.

In *Health Behavior: Theory, Research, and Practice* (2015), the authors highlight the necessity to consider constructs associated with SCT at multiple levels of the social and physical environment. To do this, they recommend enhancing SCT with the social ecological model, which allows for environmental influences to be more effectively addressed in study designs (Glanz et al., 2015; Ratcliffe, 2007). The social ecological model describes health and well-being as shaped by intrapersonal, interpersonal, organization/institutional, community, and public policy contexts (Brofenbrenner & Morris, 1998). These factors can be visually displayed as nested circles to illustrate that individual choice, behavior, and development are embedded within broader contexts. Similar to SCT, this theory has also been applied to FTS programming to understand

student outcomes (A Joshi et al., 2014; Moss et al., 2013). In this study, the social ecological model enhances the conceptual framework in two ways. First, it highlights the impacts of the wider school and community contexts on the SCT constructs relevant to teacher involvement. Second, it explains the focus on teachers as a conduit to impact student outcomes in FTS programs. Existing research has also used this theory to examine multiple organizational levels relevant to FTS (Carbone et al., 2016; Hazzard et al., 2011).

Table 2.2 lists potential factors that may influence teacher involvement in FTS programming based on a conceptual framework that combines SCT and the social ecological model. In this table, I provide concrete examples of how the constructs of SCT may apply to the involvement of teachers in FTS as actors nested within school and community contexts. Some of the factors listed in Table 2.2 are based on empirical evidence. However, many of the SCT factors have not been directly examined as they relate to teacher involvement in FTS; this research will attempt to contribute to these gaps in the literature.

Table 2.2
SCT Constructs Linked to Potential Factors that Impact Teacher Involvement in FTS at Levels of the Social Ecological Model.

SCT Construct		**Potential Factors at Levels of the Social Ecological Model**	
		Teacher-Level Supports/Barriers	**School and Community-Level Supports/Barriers**
Personal Cognitive Influences on Behavior	**Self-Efficacy**	▪ Participation in training for knowledge/skills relevant to food, agriculture, and nutrition (Knoblach, 2008) ▪ Participation in training related to pedagogy, learning goals, and teaching strategies in food,	▪ Role of non-profit in providing training for teachers (knowledge and/or skills-focused) ▪ Administrative role in supporting teacher training

Personal Cognitive Influences on Behavior	**Self-Efficacy**	agriculture, and nutrition education (Graham & Zidenberg-Cherr, 2005; Graham et al., 2004) ▪ Past experiences and/or personal interest that supports knowledge and skills related to food, agriculture, and nutrition (Graham & Zidenberg-Cherr, 2005; Jorgenson, 2013; Skelly & Bradley, 2000)	
	Collective Efficacy	▪ Involvement in FTS networks (local or national) ▪ Involvement in teacher groups/meetings around development or facilitation of food, agriculture, and nutrition education	▪ Schoolwide cohesion around FTS goals ▪ School administrative encouragement of curriculum integration ▪ Role of non-profit in providing networking opportunities for teachers ▪ Collaborative school committee to implement/sustain FTS (Hazzard, 2011)
	Outcome Expectations and Social Responses	▪ Perception that school admin would respond favorably to standards-based curriculum tied to FTS experiences (Jorgenson, 2013) ▪ Perception that curriculum integration will have positive outcomes for students and the school (Graham & Zidenberg-Cherr, 2005; Skelly & Bradley, 2000)	▪ Administrative attention to curriculum integration directed at teachers ▪ Schoolwide recognition of curriculum integration (public displays of educational projects, school newspaper, school meetings, etc.) ▪ Non-profit oversight of curriculum integration directed at teachers
	Knowledge	▪ Key concepts in food, agriculture, and nutrition (Graham et al., 2004) ▪ Pedagogy and teaching strategies in food, agriculture, and nutrition education (Jorgenson, 2013; Skelly & Bradley, 2000; Thorp, 2006). ▪ Fit in academic subjects (Knobloch, 2008) ▪ Access to curriculum with links to content standards (Graham et al., 2004 and 2005; Hazzard et al., 2011)	

Environ-mental Influences on Behavior	**Observational Learning**	▪ Exposure to modeling around food, agriculture, and nutrition education (Hazzard et al., 2011; Jorgenson, 2013) ▪ Involvement in FTS networks	▪ Role of non-profit in providing mentorship opportunities for teachers ▪ Presence of garden coordinator, food service staff, or other staff members that model teaching strategies
	Normative Beliefs	▪ Access to information about levels of curriculum integration in the school ▪ Awareness of importance of curriculum integration to overall FTS efforts and/or student learning outcomes	▪ Administrative communication with teachers about levels of curriculum integration ▪ Information about curriculum integration is shared with the school community ▪ Non-profit attention to levels of curriculum integration
	Social Support	▪ Personal support from administration, parents, or FTS program coordinators for curriculum integration (Skelly & Bradley, 2000) ▪ Funding/tools support from wider community, including non-profit, local businesses, PTOs (Hazzard et al., 2011) ▪ Informational support from school administration or FTS program coordinators, including curriculum linked to state standards ▪ Access to class materials and tools that enhance teaching and learning in food, agriculture, or nutrition education	▪ Administration provides FTS program coordinators to support teachers with curriculum integration ▪ Administration or wider community provides funds, if available, for classroom tools and materials that support curriculum integration ▪ Non-profit partner provides information and materials to teachers to support curriculum integration
Supporting Behavioral Factors	**Intentions and Goal Setting**	▪ Teachers have their own outcome goals for curriculum integration (how do they think about "successful" curriculum integration?)	▪ Administration provides teachers with goals for curriculum integration ▪ Non-profit provides goals for curriculum integration
	Reinforcement	▪ Teachers perceive feedback from the school administration in response to their efforts at curriculum integration (Thorp, 2006) ▪ Teachers perceive feedback from the non-profit partner in response to their efforts at curriculum integration	▪ Administration pays attention to teacher efforts at curriculum integration and provides feedback ▪ Non-profit provides feedback to teachers about levels of curriculum integration

Conceptual Model

The conceptual model for this paper is presented in Figure 2.2. As explained by Imenda (2014), conceptual models represent a synthesis of theories and existing literature to provide a more integrated understanding of the phenomenon of study. The conceptual model for this paper, which is based on the constructs of SCT and the social ecological model, contextualizes teacher involvement in FTS and illustrates important interactions between factors in the conceptual framework. First, the model shows the proposed relationship between teacher involvement and student outcomes in FTS programs. Specifically, student outcomes are (a) based within the broader context of school and community; and (b) strengthened by teacher involvement, which may include FTS logistics support, program development, modeling of healthy behaviors, and integration of FTS themes in the academic curriculum. This highlights the key role of the teacher in enhancing student outcomes in FTS. Second, teacher involvement is placed within a structure of social interactions informed by the social ecological model, in which engagement at the individual level is influenced by the outer spheres of school level support, community support (with a focus on a non-profit partner in FTS programming), and, at a broader level, institutional and policy level support. Third, The SCT factors are nested within the multiple contextual levels to highlight how the key constructs of SCT—organized within the framework of environmental influences, personal cognitive influences, and supporting behavioral factors—are impacted by the school, community, and policy levels. Finally, the model illustrates that these factors impact teacher involvement.

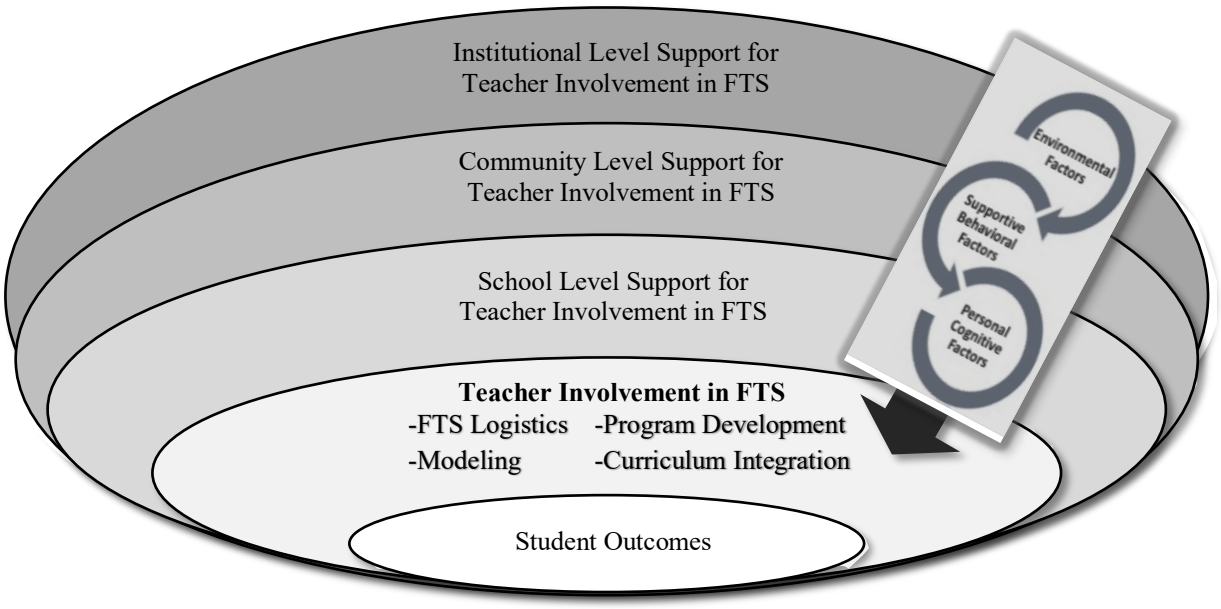

Figure 2.2 Theory-based conceptual model that illustrates influencers and relationships relevant to teacher involvement in FTS programming.

The conceptual framework is applied throughout this paper. The research questions are grounded in the constructs of SCT, and they employ language used to describe the interrelated factors described in the theory. The discussion of relevant literature is framed around SCT constructs to organize and make meaning from a set of studies with diverse research purposes and methodologies. The conceptual framework is also applied to the research design. The case study methodology allows for an in-depth exploration of the different contextual layers that impact teacher involvement, enhanced by a purposeful sampling design that includes multiple organizational perspectives. Including interview participants from multiple organizational levels—classroom teachers, school parents, school leadership, and non-profit partner staff—is essential for understanding the different SCT constructs that act on the classroom teachers in this particular school environment. The analysis also explicitly uses "start" codes based on

SCT constructs and combines perspectives from different levels of the broader context as described by the social ecological model (Yin, 2014).

Research Questions

With a foundation in SCT and the social ecological model, this research uses in-depth qualitative data to answer the following research questions:

1. How do key stakeholders (teachers, school administrators, parents, and non-profit partners) view the involvement of classroom teachers in the context of comprehensive FTS programs?
2. How do personal cognitive, environmental, and supportive behavioral factors impact teacher involvement in FTS programming?
3. Which strategies, based on SCT, may strengthen teacher involvement in FTS?

The case study model allows for in-depth exploration of teacher involvement in FTS programming at one school with a comprehensive FTS program in northern California. The conceptual framework based on SCT is the foundation for the research questions, research design, and the discussion of practical implications for FTS program development and evaluation.

Program Site Description

The case study site for this research was an elementary school with a comprehensive FTS program in northern California. California has pioneered the FTS movement since the early 2000's at the levels of state support, non-profit leadership, and networks of diverse stakeholders (Feenstra & Ohmart, 2012). California State Superintendent of Public Instruction, Delaine Eastin (1995-2003), set the stage for strong

statewide support for school gardens by calling for "a garden in every school" in the late 1990s (Ozer, 2007). This catalyzed state legislation that reserved small start-up funds for schools to develop instructional gardens. State support paired with other conditions in California—including the year-round growing season, robust community of small farmers, and leadership connected to the local food movement—led to rapid expansion of FTS programs (Feenstra & Ohmart, 2012).

The case study school, which is referred to in this study as Oakvale Elementary, was a K-6 school with a student population of 417. According to the California School Dashboard, 40.6% of Oakvale Elementary students are socioeconomically disadvantaged, which means that they are eligible for free and reduced-priced meals and/or have a parent or guardian who did not graduate from high school (compared to 60.5% at the state level) ("California School Dashboard," n.d.). Oakvale Elementary is located in a rural, ethnically homogenous county in northern California with a population of about 100,000 people ("U.S. Census Bureau QuickFacts," n.d.). Oakvale Elementary was one of the early adopter schools in the area in terms of FTS, and at the time of this study it had partnered with a local non-profit organization to provide FTS programming for approximately 10 years.

Oakvale Elementary partners with a non-profit community partner, FarmWorks to offer FTS programming. For over a decade, FarmWorks has worked to connect county families to fresh, local foods. Programs include training for aspiring farmers, a farm-based summer camp for children, a gleaning program, regional farm potlucks, and a garden building program for low-income families and public service organizations.

FarmWorks' Farm to School program currently works with 27 K-8 schools in the county to increase opportunities for students to taste and have hands-on experiences with local fruits and vegetables.

FarmWorks' FTS programming is composed of a number of strategies to increase student access to fruits and vegetables grown in the region and to support hands-on experiences with food, agriculture, and nutrition. Programming unfolds at local schools and farms, with the participation of food service, school administration, community volunteers, local farmers, and school parents. Programming at Oakvale Elementary includes the following components: Harvest of the Month program; farm field trips to partner farms; farmer visits with hands-on agriculture-related activities; a guest chef program during which community members prepare a meal with students from farm-fresh produce; an annual plant sale fundraiser; a fall garden cart; and a scratch-cooked meal program that incorporates procurement of local fruits and vegetables.

Methods

Research Design

The research questions required a design that allowed for in-depth exploration of multi-layered factors that shape classroom teacher involvement in FTS programming, a behavior that has not been thoroughly investigated. According to Creswell (2012) and Yin (2014), the case study approach allows for in-depth description of a contemporary, complex social phenomenon within its real-world context. This approach allowed for data collection and analysis that incorporated the teacher perspective as well as the perspective of stakeholders at the broader school and community levels. By conducting a single

instrumental case study, the analysis was not influenced by different FTS program designs and activities across distinct school and community contexts. The study design allows for an exploration of the interplay of factors and the resulting levels of classroom teacher involvement within one comprehensive and well-supported FTS program.

For this research, the case was an elementary school in northern California that has a high-performing, comprehensive FTS program supported by partnership with a local non-profit organization. I chose to conduct research in a school with a comprehensive FTS program for three reasons. First, schools with high performing FTS programs were more likely to provide better examples of classroom teacher involvement through increased school support of FTS in general (Hazzard et al., 2011). Second, my interest in classroom teacher involvement is as a strategy to strengthen student outcomes through the multi-component effect of comprehensive interventions (A. Evans et al., 2012). Third, key constructs of SCT as applied to teacher involvement may be shaped by partnership with a non-profit, including teacher training and networking (Cirillo & Morra, 2018).

Data Collection and Analysis

As discussed by Creswell (2011, 2012) and Yin (2014) the various sources of data collection typical of case studies are highly complementary, and a strong case study relies on multiple sources of evidence. Before conducting data collection, the research protocol was approved by the University of Vermont Institutional Review Board. Data collection for this study included semi-structured interviews, document review, and direct observation.

Semi-structured interviews. The in-depth interview is one of the fundamental sources of evidence in case study designs (Akgun et al., 2006; Creswell, 2012), as most case studies are about human phenomena. The model of shorter case study interviews was used, in which interviews are composed of open-ended questions that follow a structured protocol and last no longer than an hour (Yin, 2014). The interview protocols were based on the SCT constructs, specifically the environmental and personal influences that shape teacher involvement in FTS programming. Aspects of the interview protocol refinement framework (Castillo-Montoya, 2016) were used to design an inquiry-based conversation and to ensure that interview protocols were each aligned with the research questions.

A stratified purposeful sample was used to create a sample of key informants from the strata of (a) classroom teachers, (b) school leadership, (c) staff at the non-profit partner organization, and (d) parents (Collins, 2010; Creswell, 2012). Similar to Hazzard et al.'s (2011) study, the criteria for choosing individuals was a high level of involvement in FTS programming, as described by the non-profit partner organization or school leadership. Purposive sampling schemes are used to strategically choose cases to yield a depth of information and important perspectives to the phenomenon of interest (Collins, 2010; Miles and Huberman, 2014). Interviews with teachers, school leaders, parents, and non-profit staff that work closely with FTS at the school provided rich information about the contextual influences and diverse perspectives at the heart of the research questions.

Because different stakeholder groups are engaged in diverse activities relevant to teacher involvement, unique protocols were developed for each stakeholder group. Table 2.3 includes a sample of questions for different stakeholder groups.

Table 2.3
Sample Interview Protocol Questions for Different Stakeholder Groups

Stakeholder Group	Sample Questions
Classroom Teacher	• Do you have personal interest or experience in activities related to food, agriculture, and nutrition? • To what extent does the school administration support the farm to school programming? • Do you integrate food, agriculture, and nutrition education into your curriculum? • Are there expectations for integrating these themes in the curriculum? • How do you see food, agriculture, and nutrition education align with other academic or social/emotional initiatives at the school? • Have you ever been involved in any training to teach skills or information related to food, agriculture, or nutrition education in the classroom?
School Parent	• Have you been involved in the FTS programming at the school? For how long and what is your role? • How does the school administration support these programs? • What do you see as the benefits for the school and your children? • Have you ever seen any school reports or publications that discuss FTS? • In general, what do you believe is the role of classroom teachers in FTS? • In your experience, are classroom teachers involved in the FTS programming?
Non-profit Partner	• How would you describe the role and involvement of school leadership in FTS programming? • How would you describe the role and involvement of school parents? • How would you describe the role and involvement of classroom teachers? • Have you ever worked specifically with classroom teachers – to provide training, networking opportunities, etc.? • Do you provide any type of curriculum for classroom teachers to incorporate food, agriculture, or nutrition education in the classroom? • Do you have specific goals for integrating food, agriculture, or nutrition education themes in the classroom curriculum at Oakvale Elementary?

According to Collins (2010) the "gold standard" for sample size for purposive samples is saturation. Due to time constraints in this study, sample size guidelines were followed while attempting to reach saturation. Following Creswell's (2009)

recommendation, an ideal sample would have included at least 3-5 individuals from each strata of the sample—teachers, school administrators, parents, and non-profit partner staff. Due to difficulties in participant recruitment, a total of nine stakeholders were interviewed: two parents, the school principal, three teachers, and three non-profit staff members. All interviews were recorded for subsequent transcription and analysis. Each interview was followed by a memo to document immediate impressions, notable information, and ideas that emerged (Miles and Huberman, 2014).

Document Review. Document review focused on five types of archives: (a) school reports that document wellness policies, (b) the school newsletter and other school communications including a school blog, (c) community newspaper articles referencing FTS, (d) programmatic reports from the non-profit partner organization, and (e) state-level health education guidelines. As recommended by Yin (2014), these documents were used to corroborate and augment information from the interviews, especially to understand the environmental influences that shape classroom teacher involvement in FTS programming.

Direct Observation. Direct observation of the FTS programming supported a contextual understanding of the research questions, provided immersion as a qualitative researcher, and allowed triangulation of data from the interviews and document review (Creswell, 2012; Yin, 2014). Over the course of a spring and fall semester, observations included key aspects of the FTS programming at the school, including farm visits, guest chef classes, and farmer visits.

Data Analysis. To explore the data, general and detailed readings were done of the transcripts, using marginal notes to enhance meaning and clarity for coding (Creswell, 2012; Miles and Huberman, 2014). Thought pattern units from the interview data were then examined using "start themes" based on the SCT constructs featured in the conceptual framework and literature review (Miles and Huberman, 2014). En vivo coding was also used, based on thought pattern units, to capture additional information not outlined in the framework (Creswell, 2012). Therefore, analysis followed an abductive coding process, which allowed for an interaction between inductive coding (creating en vivo codes) and deductive coding (using "start codes") to develop a qualitative codebook (Collins, 2010). As recommended by Creswell (2012), field notes from the participant observation, document review, and interview memos were coded using the same process. To strengthen the accuracy and consistency of the coding, a process for reaching inter-coder reliability and inter-coder agreement was followed (Campbell et al., 2013).

Data interpretation followed Yin's (2014) model of analytic generalization. Grounding data interpretation in a conceptual framework that is applicable to other situations allows the analytic generalization to be posed at a "higher" conceptual level than the specific case on its own (Yin, 2014).

Findings

Analysis of data from interviews with multiple stakeholder participants, document review, and field observations revealed a low level of involvement of classroom teachers in the FTS programming at Oakvale Elementary. Themes revealed in the analysis illustrate factors connected to the constructs of SCT that may impact teacher involvement

in this school context. Specifically, in the area of personal cognitive influences, analysis showed that self-efficacy and knowledge around food, agriculture, and nutrition appear to be powerful determinants of teacher involvement in FTS at the school. Data analysis also revealed relevant environmental influences on behavior in this context, namely that social support for FTS does not target teachers and that normative beliefs around teaching and learning may prohibit teacher involvement in FTS. Finally, in the area of supportive behavioral factors, there were no existing intentions or goal setting at the school around teacher involvement in FTS. The following sections explore these findings in detail.

Classroom Teacher Involvement in FTS

Classroom teachers at Oakvale Elementary seem to enjoy, support, and "take pride" in the existing FTS programming at the school. As one teacher described,

> I see the kids coming away with a good understanding of where our food comes from. And, you know, taking care of our earth. They talk about that when we're out there at the farm. And seeing the timeline of planting and flowering and growing fruit and harvesting. Trying new foods with the Harvest of the Month. I've been very happy with the program, and it's only gotten better over the years as they continue to develop it.

However, classroom teacher involvement in FTS programming at Oakvale Elementary is largely limited to the areas of Logistics and Modeling (see Figure 1). At Oakvale Elementary, classroom teachers accompany their students on FTS educational activities outside the classroom including farm visits, guest chef visits, and farmer visits. During these visits, teachers primarily provide logistical and behavioral management support by helping to group students for activities or refocus students during an activity, such as planting basil or preparing squash. While some teachers scaffolded hands-on farm learning by asking questions and encouraging student participation, many used the FTS

programming as a time to socialize with other teachers or attend to other tasks, such as grading papers.

In addition to logistical support for existing programming, classroom teachers at Oakvale Elementary were involved in modeling healthy eating behaviors in the classroom through an informal "no-sweets policy" described by the teachers, in which they did not allow their students to freely bring high-sugar treats for birthdays or classroom celebrations. Teachers described this as "a school-wide goal to have less of that kind of stuff going on."

However, teacher involvement did not include consistent or substantial food, agriculture, and nutrition-related education in the classroom. In the words of a parent who serves as FTS liaison, "At our school, the way we have it set up, there's very minimum involvement [of classroom teachers]." None of the teachers interviewed reported incorporating FTS-related learning in their classroom curriculum, and parents confirmed that they were not aware of any food, agriculture, or nutrition activities in the classroom or included as homework. Teachers were also minimally involved in FTS planning, with the exception of a meeting at the start of each school year that advised teachers about the FTS programming planned for the year.

The following sections use SCT as a framework to investigate the factors that may act as supports or barriers for teacher involvement in FTS programming at the school.

Personal Cognitive Factors Related to Teacher Involvement in FTS

In SCT, personal cognitive influences act at the intrapersonal level to shape how an individual adopts and sustains a behavior. Key constructs in this area include self-efficacy, collective efficacy, outcome expectations, and knowledge. At Oakvale Elementary, all stakeholders pointed to existing teacher self-efficacy and/or knowledge in food, agriculture, and nutrition as a key variable for teacher involvement in FTS.

Interview participants from all groups explained that teachers with past gardening or farming experience and knowledge were much more likely to participate in FTS programming and incorporate this learning into classroom activities. In fact, this seemed to be the primary factor that supported teacher involvement. In the words of the FarmWorks Director:

> I think the majority of, well you could say this for all teachers, if good, fresh food and gardening has been a part of their lifestyle, they're already on board. And if it hasn't been, if they grew up in an urban setting with canned and processed food and they never have grown their own food, then there's definitely a lot of work that needs to get done to get them to participate.

When asked about integrating food, agriculture, and/or nutrition education in the classroom at Oakvale Elementary, parents and teachers mentioned one teacher who owns a blueberry farm, which "gives [her] an excuse, a reason to talk about it." Stated simply by the FTS Director at FarmWorks, "teacher interest is most dependent on personal interest and passion for farming and gardening." Teachers who did not have existing background knowledge in food, farm, or agriculture did not have opportunities through the school or FarmWorks to increase their experience or knowledge in these areas.

In addition, teachers reported a lack of knowledge and self-efficacy around pedagogical strategies for incorporating food, agriculture, and nutrition education in the classroom. Teacher participants expressed uncertainty about how these topics would align with academic standards in their grade levels. As one teacher shared, "I think it certainly could [align with standards]. Science, social science, could align with it some. I'm not sure if I could force it into my standards, but in some grade levels maybe." When asked about their use of the school orchard outside of the bi-annual lessons facilitated by FarmWorks, teachers did not report using it for experiences related to classroom learning. If teachers did use the space with their classes, it was to "go walk around and get some fresh air" or for "sustained reading." None of the teachers at Oakvale Elementary had received professional development or used curriculum to increase their knowledge or self-efficacy around how to successfully implement food, agriculture, and nutrition education in the academic curriculum.

While existing knowledge and self-efficacy related to food, agriculture, and nutrition was a key support in teacher involvement in FTS at Oakvale, lack of this personal background appeared to be a barrier to involvement in this context. According to the Director of FarmWorks, who has worked extensively with FTS programming in the county, "That has been very clear to me, that even when a school has a culture of health and wellness and prioritizing that for students, there's still push-back from teachers that didn't have that lifestyle, where it wasn't valued for them as children."

The following sections examine two environmental factors that interact with personal cognitive factors to shape teacher involvement in FTS at Oakvale Elementary: social support and normative beliefs.

Environmental Factors Related to Teacher Involvement in FTS

Environmental influences act at the interpersonal level to shape self-efficacy and motivation for engaging in a target behavior. These aspects of the perceived or physical environment promote, permit, or discourage engagement. Data analysis also illustrated how environmental factors—including social support and normative beliefs—may influence teacher involvement in FTS programming at Oakvale Elementary.

Social Support. In the SCT framework, social support refers to relationships that promote a given behavior by promoting and protecting an individual's well-being, including esteem, informational, and instrumental support. Social support for teachers may come from colleagues, school administration, and/or stakeholders at the community level including a non-profit partner or community volunteers. Key examples of social support for FTS in general were evident in my research at Oakvale Elementary. Interview participants across the board reported that both the school administration and the current district superintendent were highly supportive of FTS programming. The school's Healthy Kids Programming teacher said of the school administration, "They're huge, they're our biggest supporters. They support everything we do with FarmWorks. Anything that I ask to do, they always let me do it if it has to do with anything that keeps the kids healthy." As evidence of this, the school administration has always elected to participate in every programming opportunity offered by FarmWorks. Furthermore, they

fund the Healthy Kids program, which provides an integrated physical education and nutrition class to all students. This administrative support, however, does not specifically target classroom teacher involvement in FTS; rather it supports FTS programming in general at the school.

There is also a high level of parent support for FTS programming at Oakvale Elementary. Oakvale Elementary is the only FarmWorks partner school that does farm field trips with every grade level each year, in large part because the Parent Teacher Club performs additional fundraising. Parents provide hands-on support during the farm field trips, and the teachers interviewed have received positive feedback from the parents who participate: "Those are the parents I hear from, and they love it. They have very positive things to say about [the FTS programming]." In addition, the role of FTS liaison, who is responsible for coordinating FTS program logistics and maintaining relationships between school and community stakeholders, has been filled by a parent for several years at Oakvale Elementary.

Community support in general for FTS programming is also very strong at Oakvale Elementary. FarmWorks is an invaluable FTS resource for all the area schools, offering a wide range of programming that connects students with fruits and vegetables, providing funding to increase access to the programming, and working directly to connect local producers to schools. FarmWorks also funds and directs the team of FTS liaisons, who are responsible for the majority of programming logistics including organizing bussing, coordinating farm field trips, scheduling guest chefs, and running the garden cart. "They put those pieces in place so that the teachers who are already so

maxxed out in most cases don't have to do that aspect of the work," reported the FarmWorks FTS Director. The local newspaper also features FTS-related content regularly throughout the year, informing local residents of the range of programming at the schools and highlighting each Harvest of the Month item. Similar to administrative and non-profit partner support, however, this support does not currently directly target classroom teachers or report on their involvement in FTS programming.

While parents, school leadership, and the broader community supported FTS efforts in general at Oakvale Elementary through fundraising, programming, and publicity, there was a lack of social support targeted at classroom teacher involvement. No informational support in the form of a curriculum to integrate FTS themes in the classroom had been institutionalized by the school or provided to teachers by FarmWorks. Also, school administration had not provided professional development, planning time, or materials funding to help involve teachers in FTS programming and support the integration of food, nutrition, and agriculture themes across the classroom curriculum. The FTS Director at FarmWorks spoke to the importance of social support to teacher involvement in FTS:

> I think individual teacher motivation does really make a huge difference. But there's also things that can be done institutionally and organizationally to provide structure to make it easy for teachers who aren't personally motivated to participate and to make it meaningful.

Normative Beliefs. As a type of environmental influence included in SCT, normative beliefs are described as beliefs about the acceptability and perceived prevalence of a behavior. In this context, beliefs about the role of teachers, the nature of classroom learning, and the goals of teaching and learning are normative beliefs that

would impact teacher involvement in FTS. At Oakvale Elementary, a prevailing belief echoed by all interview participants was that classroom teachers simply did not have the time or energy to "add" things to their schedule. Teachers pointed to lack of time as the primary barrier to their involvement in FTS. "It's a barrier for a lot of things," one teacher stated. "You just run out of time." When asked if she integrated food, agriculture, or nutrition education in the classroom curriculum, another teacher explained,

> Not as much as I would like to. It's always, there are things that come up in our brains, all kinds of things that we'd like to do. And you run out of time. So, I haven't done very much of that.

The FTS Director at FarmWorks generalized her experience of working with teachers in the following way:

> The teachers are already so maxxed out in most cases, the majority of teachers are just, they're working so hard, and they're not paid very well, and they don't have any extra, and we do hear…that complaint. And that's real. And I don't really know how to get around that at some level.

All stakeholders mentioned time pressure, and they also spoke directly to the pressure for students to focus strictly on core academic subjects. When asked about her use of the school orchard space, one teacher responded, "No, we're third grade, we don't get to go out and have a lot of fun. We're all about writing and getting them into reading." The FarmWorks Co-Director also spoke to the pressure on teachers to focus on standardized student assessments, which seems to detract from their involvement in FTS. "It's all about getting all these concepts lined up so kids can pass the test. Which is sad."

Supportive Behavioral Factors Related to Teacher Involvement in FTS

Supportive behavioral factors are described in SCT as antecedents to behavior. They include intentions and goal setting, such as positive outcome expectations, as well

as reinforcement for behavior. In the context of teacher involvement in FTS, supportive behavioral factors might include outcome goals for integration of FTS themes in the academic curriculum, positive reinforcement for teachers, or specific goals or expectations for teacher involvement.

There appeared to be a lack of supportive behavioral factors present at Oakvale Elementary to support teacher involvement in FTS. At a general level, stakeholders involved in Oakvale FTS did not have the "3-C" approach to FTS, in which the classroom is a fundamental part of an integrated food, agriculture, and nutrition education. The classroom and academic learning were not viewed as elements of FTS, and FTS programming was not seen as an avenue for enriching academic subject learning. Interview participants contrasted traditional academic subject learning in classrooms with the hands-on, active, experiential learning of FTS. "I love," one parent reported, "the tactile approach of the farm-to-school education. It's not just about sitting in a classroom and getting a lecture. It's about getting outside and getting active with your hands." Furthermore, stakeholders at Oakvale Elementary did not appear to have the perspective that a potential goal or outcome of FTS programming would be to enhance academic learning. While participants expressed a wide range of goals and outcomes for the FTS programming at Oakvale—including eating more vegetables, valuing fresh food, learning where food comes from, and a desire to care for the earth—not one participant or program document referred to a link between academic learning and FTS programming

At the level of school leadership and the community partner, there were minimum expectations for teacher involvement in FTS. "All teachers," the school principal

reported, “have the same level of involvement in farm-to-school. They do the farm tours, the Harvest of the Months, and the farmer visits.” Teachers reported that their primary responsibility was to participate in the existing programmed FTS activities. When asked about expectations from school leadership or FarmWorks to integrate FTS themes in the curriculum, one teacher reported, “No, that hasn’t really come up. I think the administration knows that we have more to teach than we have time for.” One parent explored the issue of school leadership expectations:

> I guess if there was a disconnect, perhaps it’s administration saying, “Hey teachers, we’re going to get this into the classroom,” and making it more standard. But I don’t know if that matters or not, as long as it runs smoothly.

To highlight the potential role of outcomes expectations from school leadership, the FarmWorks staff reported on another local school that exemplified how school administrative support can promote teacher involvement. At this school, the school principal “has been very invested in the school garden program and has made sure that the teachers come [to the garden] at least once a month and use the garden as part of the school curriculum.” The principal, reported a FarmWorks staff member, “was really instrumental in making the program happen.” This type of support and oversight from the school leadership appeared to be instrumental in garnering teacher support and involvement in garden-based education and integration of FTS themes in the classroom.

Discussion

The case study research at Oakvale Elementary revealed a low level of teacher involvement in FTS programming at the school, leading to a FTS program that was strong in the domains of the community and cafeteria but weaker in the area of the

classroom. As discussed previously, this finding parallels a recent survey of FTS integration at Vermont schools, in which classroom integration was found to be the most challenging area for schools (Vermont Department of Health, 2018).

At Oakvale Elementary, findings suggest that self-efficacy and teacher knowledge contributed to teacher involvement, while untargeted social support, normative beliefs around teaching and learning, and a lack of outcomes expectations and reinforcement from the level of school leadership and the community partner were potential barriers for teachers. These key findings can be situated within a body of existing literature. While research on comprehensive FTS programming is still limited, existing literature on school gardening, nutrition, and agriculture education are used to contextualize the findings.

This section uses SCT as a tool to identify potential strategies to increase the level of teacher involvement in FTS programming, which research suggests would strengthen student outcomes (A. Evans et al., 2012; A Joshi et al., 2014; Ratcliffe, 2012). Using the SCT framework paired with existing research, this section outlines potential strategies to increase teacher involvement in the context of Oakvale Elementary.

Knowledge and Self-Efficacy for Teacher Involvement

Existing studies corroborate the finding that teacher experience and knowledge are key factors involved in the incorporation of nutrition or garden learning in the classroom. Teachers with personal experience with food, agriculture, and nutrition seem more likely to incorporate those topics in the classroom. An important rationale for teachers to incorporate garden learning in academic instruction in Jorgenson's (2013) study were personal environmental memories. The teachers' own experiences in nature as

children, which led to a belief in the inherent value of appreciating nature, were an important factor in their desire to provide similar experiences for their students by incorporating garden-based learning in their curriculum. Similarly, elementary teachers surveyed in Skelly and Bradley's (2000) quantitative study listed a personal love of gardens as an important rationale for including the garden in academic instruction. Conversely, a lack of teachers' experience with gardening was chosen by 61% of teachers surveyed in California as a dominant barrier to using the garden in academic instruction (Heather Graham & Zidenberg-Cherr, 2005).

In addition, research shows that teachers with relevant pedagogical knowledge and experience are more likely to integrate FTS-related themes in the classroom. This includes strategies for incorporating food, nutrition, and agriculture themes into existing curriculum; how to align those themes with existing educational standards; and opportunities to use FTS activities as experiential connections for classroom content. A key variable correlated with higher rates of agricultural activities taught by teachers in Knobloch's (2008) study was what the researchers called the "fit in academic subjects" factor, a "cognitive factor" that allowed the teachers to see the connections between agriculture and academic subjects. This understanding of how agriculture could be valuable as a context to apply academic content to real-world situations was directly connected to teachers' likelihood to integrate agriculture in the academic curriculum, even in the context of high-stakes pressure around standardized testing. Similarly, teachers in Skelly and Bradley's (2000), Jorgenson's (2013), and Thorp's (2006) studies expressed pedagogical reasons as key rationales for incorporating gardens into academic

instruction. For these teachers, skills and knowledge about how to incorporate experiential, place-based, and inquiry-driven pedagogy into the academic curriculum was a key factor for integrating school garden learning.

Research points to several strategies to support teacher involvement by acting to increase teachers' knowledge and self-efficacy. Teacher training for knowledge/skills in food, agriculture, and nutrition may increase self-efficacy related to these themes (H. Graham, Feenstra, Evans, & Zidenberg-Cherr, 2004; Heather Graham & Zidenberg-Cherr, 2005). In addition, training related to pedagogy, learning goals, and teaching strategies for these themes may also support classroom teacher involvement (Knobloch & Martin, 2002). Finally, teachers may also benefit from professional development on connecting FTS learning with academic content standards (Cirillo & Morra, 2018).

There is evidence that these types of opportunities may be of interest to classroom teachers. Among teachers (N=1,014) surveyed in a 2010 report on the Illinois Farm to School program, for example, 74% reported that they would be likely/very likely to attend teacher training opportunities related to the incorporation of local food and nutrition education activities into existing curriculum (Horstmann & Scott, 2010). A recent survey of FTS programming at Vermont schools included the most common areas of professional development for school staff who teach FTS (Vermont Department of Health, 2018): (a) teaching strategies that are age-appropriate, relevant, and engaging for students (51% of schools); (b) goals, objectives, and expected outcomes (38% of schools); (c) methods to assess student learning (29%); (d) written curriculum (26%); and (e) curriculum charts describing the sequence and scope of FTS learning (16%).

Observational learning, in which an individual learns new information and behaviors by observing the behaviors of others, may be another personal cognitive strategy to promote teacher involvement in FTS. Jorgenson's (2013) study illustrates this factor in the context of teachers that learn how to incorporate the garden in academic curriculum through role modeling from a garden coordinator at the school. One teacher, for example, did not start using the garden regularly until she saw how the garden coordinator planned and led lessons. Hazzard et al.'s (2011) article on the use of instructional gardens also points to the foundational role of a garden coordinator as well as volunteers from the Master Gardner program, who could provide modeling for teachers.

Social Support for Teacher Involvement

Existing research also points to the importance of directed social support for classroom teachers to integrate food, agriculture, or nutrition themes in the classroom. Of the 70 Florida elementary teachers surveyed in Skelly and Bradley's study (2000), 54% of teachers listed encouragement by the administration as a reason for using the school garden. Although this data does not provide information about the nature or extent of this encouragement, Hazzard et. al's (2011) qualitative analysis further describes the importance of "allies" to teachers, ideally a partnership between a garden coordinator, teachers, a supportive administration, and parents.

The importance of informational support for teachers—in the form of a curriculum to guide standards-based integration of nutrition, agriculture, or garden-based learning—has been highlighted in every relevant study (Burt et al., 2017; Graham et al.,

2004, 2005; Hazzard, Moreno, Beall, & Zidenberg-Cherr, 2011). The lack of a curriculum linked to state standards was, behind lack of time, the greatest barrier for teachers in integrating nutrition and garden-based learning in Graham et al.'s surveys (2004, 2005) of California teachers. These teachers stated their desire for the state to provide curriculum support, especially linking garden-based learning to state standards (Graham & Zidenberg-Cherr, 2005). Of the schools included in Hazzard et al.'s (2011) research, two schools had specific standards-based garden curriculum. All other lessons were created by teachers, garden coordinator, or parent volunteers based on standards-based textbooks. Teachers and other key informants reported that an ideal curriculum would involve "quick, easy lessons" that were based on state content standards and clearly laid out over the normal growing period.

Jorgenson (2013) also underscores the importance of making curriculum available for teachers to support school garden integration. The author interprets the internal teacher factors, including environmental memories and beliefs about teaching and learning, as "potential sources of empowerment that become active in the presence of external incentives, the most significant of which, in this case, is the availability of garden coordinators and lesson plans linked to state science standards" (Jorgenson, 2013, p. 125). This interpretation supports the idea of reciprocal determinism explained by SCT, in which behavior is shaped by an interplay of personal cognitive and environmental factors.

Over the past ten years, a great number of curriculums have been developed at federal, state, and local levels to accompany FTS programs, so there is a plethora of

existing curriculum materials for educators to draw on as they plan how to integrate food, nutrition, and agriculture education across the curriculum. Many of these curriculums have been developed to connect place-based food and agriculture education to state standards. For schools participating in Federal Child Nutrition Programs, the USDA provides Team Nutrition curricular materials including nutrition education resources and garden activities ("Resource Library | Food and Nutrition Service," 2017). At the state level, the California Department of Education also offers FTS curricular materials linked to state standards (Heather Graham et al., 2005). Non-profit organizations such as the Edible Schoolyard have also been leaders in developing curriculum and training for teachers ("Our History | The Edible Schoolyard Project," n.d.).

In addition to curriculum, research shows that school leadership could provide additional logistical support to increase teacher involvement in FTS (Burt et al., 2017). For example, principals in one study report providing planning time, stipends, and professional development for educators to integrate FTS concepts in the classroom curriculum (Cirillo & Morra, 2018).

Beliefs about Teaching and Learning

Both the present study and existing research illustrate the pervasive nature of normative beliefs around teaching and learning that appear to act as barriers for teachers to integrate non-traditional subjects or teaching styles in the classroom. Existing studies bring to light the importance of normative beliefs in shaping teacher involvement in agriculture, nutrition, or garden-based learning. According to teachers, one of the most prevalent barriers to incorporating food, agriculture, and nutrition education in the

classroom is lack of time. Teachers in Graham et al.'s surveys (2004, 2005) listed time as the most significant barrier to incorporating nutrition and garden-based learning in the curriculum. Similarly, key informants including teachers in Hazzard et al.'s (2011) study reported that time was a significant barrier to using instructional school gardens. It is essential to clarify that when teachers in these studies refer to lack of time, they are not speaking to a lack of time overall in the school day. Rather, they are referencing the pressure to "teach to the test" and to meet state standards for student academic achievement. "Time is probably the single biggest hurdle," one teacher commented. "We're all trying to meet [state] standards and need to figure out how to fit gardening lessons and activities into existing curriculum" (Graham et al., 2004. p. 203). This pressure reflects wider normative beliefs about the goals of education and the role of teachers and students, which teachers may perceive as an intractable barrier to teaching material that is not directly connected to standardized tests. Teachers in Thorp's (2006) ethnography speak to the significance of this sense of pressure: "Assessment informs and drives your practice" (p. 15).

Ample national-level data provides evidence of this trend. For example, in a 2006-2007 survey by the Center on Education Policy that examined instructional time in elementary schools since No Child Left Behind was enacted in 2001-2002, 62% of all districts reported increased classroom time dedicated to ELA and math, with significant cuts to social sciences, science, art and music, and physical education (McMurrer, 2008). Research on place-based learning and school health initiatives show similar trends, in which the pressure on schools to meet state standards has impacted teachers' and

administrators' adoption of programming across the country (Lewallen et al., 2015; P. Williams & Labelle, 2017).

Both the present study and existing research illustrate the pervasive nature of normative beliefs around teaching and learning that may act as barriers to integrate food, farm, and agriculture in the classroom. There is research that points to the potential to counteract this by changing beliefs about the educational benefits of enriching academic subjects with real-world topics. In Knobloch's (2008) research, one of the most significant teacher belief variables in explaining the extent to which agriculture activities were incorporated in the academic curriculum was teachers' perceptions about the value of agriculture curriculum integration. The teachers who conducted the most agriculture-related activities in the classroom saw the "positive educational benefits of integrating agriculture as a means to enrich student learning and development" (Knobloch, 2008, pg. 535). These positive beliefs, the authors assert, led to positive attitudes and norms around curriculum integration, which impacted the behavior of integrating agriculture themes in the curriculum. In two existing surveys, teachers reported that one of the top reasons they used the garden was because it "helped students learn better," and they expected gardens to improve learning for students (Heather Graham & Zidenberg-Cherr, 2005; Skelly & Bradley, 2000).

Outcome Expectations for Teacher Involvement

There is limited existing research that points to the role of supportive behavioral factors in impacting teacher behavior in food, agriculture, or nutrition education. However, Jorgenson's (2013) study touched upon this factor in a discussion of

curriculum, in which a teacher shared her belief that the school administration would respond favorably to a standards-based curriculum tied to garden instruction. Also, in Graham et al.'s (2005) study, 89% of principals listed academic outcomes as a key goal for FTS programming. This type of school leadership support for the classroom domain of FTS did not appear to exist at Oakvale Elementary; however, this is an area that deserves additional research.

Strengths and Limitations of Study Design

A fundamental limitation of the case study design is lack of generalizability (Creswell, 2012; Yin, 2014). This may be especially relevant for single instrumental case study designs. In this study, another limitation was the small sample size, particularly the number of teachers that were interviewed. Time and scheduling constraints on the part of classroom teachers was a barrier to including more teacher interviews. In addition, teachers participated on a volunteer basis, which could potentially bias the sample. An additional analytic limitation is that the unit of analysis for this study—a school with a comprehensive FTS program—does not correspond to the units of analysis in the majority of existing research, making it more difficult to compare and contrast results (Yin, 2014).

The strengths of this study respond to some of the limitations. All aspects of the study are clearly linked to a theoretical framework, which make it generalizable to theoretical propositions (Yin, 2014). The careful selection of a high-performing FTS program reveals the personal and environmental factors that impact teacher involvement, without confounding from different types of FTS programs. Furthermore, the focus on

qualitative methods allows for a rich and comprehensive analysis of teacher involvement in FTS (Creswell, 2012; Yin, 2014). An additional strength of the study design is that data was triangulated from multiple sources and organizational levels, allowing for a more complete analysis despite the small sample sizes among individual stakeholder groups.

Implications

At a practical level, this study contributes to program improvement, as FTS programs have the stated goal of integrating food, agriculture, and nutrition themes across the curriculum as a strategy to improve student outcomes (Feenstra & Capps, 2014; Heather Graham et al., 2005). By investigating the factors that influence teacher involvement in FTS programs, this research can support teachers, administrators, and non-profit partners in improving comprehensive FTS programming. School leadership as well as non-profit partner organizations that support FTS programming at schools may turn to these strategies to strengthen teacher involvement to potentially improve student outcomes through the effects of multi-component programming.

This study may also be relevant for researchers in the fields of professional development, curriculum innovation, and food, agriculture, and nutrition education. It may also be used as a resource to explore and compare the different aspects of FTS that lead to outcomes for students and schools.

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CHAPTER 3

Farm-to-School in the Cafeteria: Outcomes for Students and School Community

Introduction

An established body of research illustrates that a healthy diet is essential for physical, social, and academic development and well-being in children. With rising rates of childhood obesity, the issue of childhood health and nutrition has received increasing national attention, and schools are recognized as an important intervention point to provide all students with access to high-quality, nutritious food (E. Bergman, 2010; Leviton, 2008). The National School Lunch Program (NSLP) is the second largest food assistance program in the country, and it provides all students access to lunches served at school (Peckham et al., 2017). This program plays a particularly important role for students from low-income families, who receive free or reduced-priced meals. As of 2016, over 30 million children in the country participated in the NSLP daily, with over 75% of those receiving free- or reduced-price meals (Hayes, Contento, & Weekly, 2018).

Before the introduction of the Healthy Hunger Free Kids Act (HHFKA) in 2012-2013, school meal programs were often characterized by foods of minimal nutritional value and a lack of compliance with standards for school food programs (Jaime & Lock, 2009). Studies found that children who participated in school meal programs exceeded recommended levels of average carbohydrate intake as well as intakes of fat, saturated fat, and sodium (Clark & Fox, 2009). However, the HHFKA mandated school meal patterns to include a wider variety of fruits, vegetables, and whole grains as well as to limit sodium, calories, and saturated fats (Hayes, Contento, & Weekly, 2018; “Nutrition

Standards in the National School Lunch and School Breakfast Programs," 2012). Studies since the changes in mandated meal patterns show an improvement in the quality of school food, with increased fruit and vegetable consumption by students and a reduction in calories from fat and saturated fat (E. A. Bergman et al., 2014; Schwartz, Henderson, Read, Danna, & Ickovics, 2015; Terry-McElrath, O'Malley, & Johnston, 2015).

Alongside improvements in the nutritional quality of school food, experts advocate for comprehensive, integrated school nutrition programs to maximize positive outcomes for students. In 2018, The Academy of Nutrition and Dietetics, the School Nutrition Association, and the Society for Nutrition Education and Behavior published a position paper that broadens the responsibility of schools to not only provide nutritious meals for students but to establish integrated nutrition programs that "are essential to improve the health, nutritional status, and academic performance of our nation's children" (Hayes et al., 2018, p. 913). According to the report, integrated nutrition programs include food and nutrition services available throughout the school campus, nutrition initiatives such as farm-to-school and school gardens, wellness policies, and nutrition education and promotion. Farm-to-school (FTS) programs are recommended as a key strategy to maximize nutrition outcomes for students.

In recent years, FTS programs have grown in popularity at the national level, gaining attention as a comprehensive strategy for improving school nutrition environments. FTS can be defined as an "integrated food, farm and nutrition education program" that provides students with locally produced foods as well as agriculture and nutrition learning opportunities with the goal of helping students to develop healthy

eating habits (Vermont Department of Health, 2018). Core program elements include improved school food through local procurement and hands-on education activities related to food, agriculture, and nutrition—including school gardens, farm field trips, and cooking classes (A Joshi, Henderson, Ratcliffe, & Feenstra, 2014; Thompson, Ghelardini, Keene, & Stewart, 2014). Comprehensive FTS programming, according to the "3-C" approach embraced by leaders in the FTS movement, includes interventions in three domains: the cafeteria, classroom, and community ("What is Farm to School? | Vermont FEED," n.d.). FTS programming in these domains may include procurement of local food; school gardens; and education related to food, agriculture, and nutrition (A Joshi et al., 2014).

Comprehensive FTS programming intersects with and supports school food environments in several important dimensions. FTS programs improve the quality of food served in school cafeterias by incorporating fresher local foods including fruits, vegetables, dairy, and eggs (Nicholson, Turner, Schneider, Chriqui, & Chaloupka, 2014; Vermont Department of Health, 2018; Yoder et al., 2014). Incorporating fresh fruits and vegetables leads to more scratch-cooked meals and less processed foods (A Joshi & Azuma, 2008); and research shows that when students have access to more fresh fruits and vegetables, they are more likely to consume the recommended amounts (Anupama Joshi & Ratcliffe, 2012; Knai, Pomerleau, Lock, & McKee, 2006). In addition to improving the quality of food served in school cafeterias, integrated and experiential food, farm, and nutrition education programming increases healthy food choices made by students. Existing literature on outcomes for students that participate in FTS

programming demonstrates the potential for these integrated programs to change knowledge and attitudes around healthy eating (A Joshi & Azuma, 2008; Knai, Pomerleau, Lock, & McKee, 2006) and improve student nutrition behaviors (Berezowitz, Bontrager, Yoder, & Schoeller, 2015; Savoie-Roskos, Wengreen, & Durward, 2017). Schools with FTS programming have also reported additional benefits for the school meal program, including greater community support for school meals, greater acceptance of HHFKA changes, lower meals costs, increased participation, and reduced food waste (Hayes et al., 2018; Farm to School Census, 2015).

Despite research demonstrating the positive outcomes for students from improved school food service—especially in the context of an integrated nutrition program like FTS—there are still significant barriers for institutions to improve school food quality, whether by reducing processed foods and/or incorporating locally procured foods. In general, school food service staff have to navigate nutritional standards and strict budgetary constraints ("USDA ERS - Balancing nutrition, participation, and cost in the National School Lunch Program," n.d.). Significant changes may be required to kitchen infrastructure to accommodate scratch-cooked meals, and schools that make a commitment to prepare locally produced foods may require significant kitchen infrastructure upgrades (Vermont Department of Health, 2018). Additional barriers perceived by schools to incorporating local, fresh foods in school kitchens include reliable and consistent supply, storage, ordering, and food safety (Botkins & Roe, 2015; Izumi et al., 2010; Vermont Department of Health, 2018).

This article examines several of the key issues at the intersection of FTS programming and school food through a case study of a new lunch program instituted at a small school district in northern California with a robust FTS program. Through a mixed-methods analysis incorporating semi-structured interviews and lunch numbers data, this paper discusses the school- and community-level factors that supported school food change, preliminary outcomes for students, and additional changes to school food indicators including food waste and adult participation in the school meal program. This paper takes a broad approach to the study of student outcomes, as demonstrated by other studies in the field of FTS that point to improved attitudes around school food, student engagement, and psychosocial and academic indicators (Burt, Koch, & Contento, 2017; A Joshi et al., 2014; Anupama Joshi & Ratcliffe, 2012; Ozer, 2007; Williams & Dixon, 2013).

This paper responds to several gaps in the literature that impact the development and effectiveness of initiatives to improve school food quality, both in the context of schools with FTS programs and schools without FTS programming. At a broad level, the Academy of Nutrition and Dietetics, the School Nutrition Association, and the Society for Nutrition Education and Behavior call for both quantitative and qualitative research to document school nutrition program effectiveness (Hayes et al., 2018). This includes evaluating the outcomes of innovative school food programming with the goal of improving children's health. Within the FTS arena, the National Farm to School Network has also identified key areas of further research needed to develop, improve, and sustain FTS programming in the cafeteria (A Joshi et al., 2014). Several of these areas are

concerned with the profitability of improved nutrition programs, including a focus on the number of full-pay students and adults that participate in school meals programs.

This article responds to these research needs and contributes to existing literature in the fields of school food and FTS programming. Specifically, the research asks the following questions:

(1) What factors supported the school district in developing and implementing a new school food program?

(2) What were the preliminary outcomes for students connected to the new lunch program during the first year of implementation? Specifically, were there

- student behavior outcomes, such as changes to school meal participation and food choices;
- student attitude outcomes around perceptions of school food; or
- food preferences outcomes?

(3) Were there changes to other school food indicators during the first year of program implementation, including adult participation and food waste?

This paper is unique among existing literature in its mixed-methods approach and for incorporating a diverse range of perspectives—including food service, parents, teachers, and school leadership—to provide a more complete understanding of school food change and outcomes for students. It is rooted in the perspective of Weaver-Hightower (2011), who outlines in *Why Education Researchers Should Take School Food Seriously* that food and eating "play vital roles" in education, impacting student attainment and achievement, teaching and administration, and social justice issues within

schools. The author argues that "we can and should…view food as an integral component of the ecology of education—the broader interconnections of actors, relationships, conditions, and processes of which education is composed" (Weaver-Hightower, 2011, p. 15).

Program Site Description and History

This study was conducted in a predominantly rural county in northern California. According to a 2017 Supplemental Nutrition Assistance Program county profile (USDA SNAP-ED, n.d.), 34% of children ages 6-17 in the county live at or below 185% of the national poverty level. 23% of children in the county are food insecure, and 48% of students in the county are eligible for free and reduced-priced meals. On par with the national averages, 55% of adults and 20% of children in the county are overweight. Only 37% of SNAP recipients in the county report being able to access fresh fruits and vegetables in their neighborhood, and only 41% of children ages 2-11 consumed the recommended five servings of fruits and vegetables when surveyed.

The research was conducted at a school district that I refer to as Mountain City School District. The district is composed of an elementary school (referred to as Oakvale Elementary) with 417 students and a middle school (referred to as Hills Middle School) with 381 students. Until the 2016/2017 school year, Mountain City School District contracted with Central Kitchens for their school lunch program. Neither school in the district has a working kitchen, so meals were provided in plastic trays containing pre-cooked processed food items. The trays were sealed in plastic, heated at the schools, and served to students.

Both schools in the district collaborate with a local non-profit organization to provide a FTS program to students, including Harvest of the Month, farm visits, guest chef programming, and farm field trips. More broadly, FarmWorks works to promote regional food for children and families, including programming in FTS, garden installations for low-income families, and farmer education programs. As part of their food procurement initiative, FarmWorks partners with institutional food service directors to create and nurture "farm-direct" relationships. FarmWorks negotiates procurement opportunities with regional farmers, provides educational and marketing materials, purchases necessary equipment for scratch-cooked meals, supports food service directors with menu planning tools and ideas, and shares knowledge and best practices with wider networks.

Over a period of several years, FarmWorks collaborated with the school district office and food-service directors to develop and provide a new lunch program that would offer fresh, healthy, locally-sourced meals to students and school staff. The new *Healthy Meals* program, which was instituted in 2017/18 academic year at Oakvale Elementary and Hills Middle School, offers "made-from scratch meals, fresh regional ingredients, and reduced packaging and waste." Because neither school has a working kitchen, the program was based on a vending agreement negotiated between Mountain City School District and the local Joint Union High School district. For over seven years, FarmWorks has collaborated extensively with the Joint Union High School food service team to improve food quality and local purchasing. The 2017/2018 average farm-direct ordering from local or regional producers was 6% for the high school district, up from 5% from

the previous year. This number increases to as much as 13% during peak harvest months. For the *Healthy Meals* program, the Joint Union High School food service staff prepares additional scratch-cooked meals that are transported to the elementary and middle school and served to the students. In order to guarantee a profitable agreement that would cover the costs of preparing and transporting additional meals, Mountain City School District agreed under contract to purchase at least 150 meals per day, regardless of the actual number of students ordering lunch.

Mixed-methods research was conducted in May and June of 2018, at the end of the first year of the *Healthy Meals* program. Through interviews, document review, and analysis of lunch numbers data, this research revealed factors that supported the district in radically improving the quality of its school food; preliminary outcomes for students after one year of the new meal program; and changes to other school food indicators including food waste and adult participation in the meal program. This research was part of a larger case study of FTS programming in the school district. While this article explores the cafeteria aspect of FTS programming, additional articles explore the community and classroom aspects of FTS.

Methods

As the data collection and analysis strategies shape the type of information obtained from research, mixed methods are applied for specific research purposes. In *Designing and Conducting Mixed Methods Research*, Creswell (2011) explains the various research "needs" that underpin a mixed methods design. In this study, collecting and analyzing different types of data, both qualitative and quantitative, "provides a more

complete understanding of the research problem than either approach by itself" (Creswell, 2011, p. 8). Mixed methods are used specifically for "complementarity," to understand with greater detail the broad outcomes for students connected to a healthier school meal program (Creswell, 2011).

This research used a mixed methods case study design. According to Creswell (2007) and Yin (2014), the case study approach allows for in-depth description of a contemporary, complex social phenomenon within its real-world context, such as FTS program development and an exploration of student outcomes.

The case study methodology describes an approach in which the researcher gathers in-depth, detailed data about a bounded system through multiple sources of information. This research represented a single instrumental case study (Creswell, 2012), which allowed for rich description of program development and student outcomes from one bounded case without the potential confounding caused by multiple program strategies across different school district environments. Research around this particular lunch program was timely. Data was collected at the end of the first year of the program, which allowed for interview participants to more easily recall and compare student behaviors and preferences from the previous school year.

While Creswell (2012) limits a case study to qualitative methods, Yin (2014) describes a broader approach that may include multiple methods, whether a combination of qualitative and quantitative methods or a mixing of complementary data collection strategies. This study relies on mixed methods to provide a more complete understanding of student outcomes, specifically from the perspective of classroom teachers and other

key stakeholders. Prior research in the field of FTS has utilized a mixed methods research design to have a "generative and open" approach, to provide a better understanding of conditions, to more richly explore meaning in data, and to promote "critical multiplism" (e.g., integrate different perspectives) (Burt et al., 2017). These rationales are relevant to this research as well, especially a holistic approach to understanding the range of student outcomes connected to the *Healthy Meals* lunch program.

In this case, understanding program history and student outcomes is enhanced by more than one data source and multiple data collection and analysis strategies. Although the overall approach gives primacy to rich qualitative data (QUAL + quant design), quantitative data collection and analysis provide a numerical and objective analysis of student outcomes. This (QUAL + quant) approach has been employed by other mixed methods researchers to explore complex areas of human behavior (B. C. Evans et al., 2011).

According to Small (2011), mixed data-collection studies are based on at least two types of data or two means of collecting the data. Furthermore, a mixed data-analysis study employs more than one analytic technique or cross techniques. Following Small's definition, this research qualifies as both a mixed data-collection and data-analysis study, as discussed in the following sections. Mixing qualitative and quantitative data provides a more complete picture of student outcomes. This mixed methods study follows a convergent parallel design, in which the qualitative and quantitative data were collected and analyzed separately during the same time period. The mixing of the qualitative and

quantitative data occurred during the interpretation phases, when conclusions and interpretations represented a synthesis of the different types of data (Creswell, 2011).

Qualitative Data Collection and Analysis

When researching educational programming, literature points to the importance of using qualitative tools that allow the voices and perspectives of participants to shape our understanding of student outcomes (Flutter and Rudduck, 2004). In the qualitative strand of this study, interviews and document review were used to explore *Healthy Meals* program history and outcomes for students.

Semi-structured interviews. The in-depth interview is one of the fundamental sources of evidence in case study designs (Akgun et al., 2006; Creswell, 2012), as most case studies are about human phenomena. Data collection followed the model of shorter case study interviews, in which interviews were composed of open-ended questions that follow a structured protocol and last no longer than an hour (Yin, 2014). Depending on the stakeholder group, interview questions broadly asked participants to share any changes they had noticed in their students/children related to the *Healthy Meals* program, including student attitudes towards the new lunch program, food preferences, or energy levels. Stakeholders involved in the lunch program development were asked about its history; and the adults who worked in the schools were asked about their own perspectives of the food quality and meal program participation.

A stratified purposeful sample was used to interview key informants from the strata of (a) school administrators, (b) classroom teachers, (c) food service staff, (d) parents, and (e) staff at the non-profit partner organization (Collins, 2010; Creswell,

2012). Purposeful sampling schemes are used to strategically choose cases that will yield a depth of information and add important perspectives on the phenomenon of interest (Collins, 2010; Miles and Huberman, 2014). Interviews with diverse stakeholders that have experienced FTS in the district provided the richest information around the contextual influences and diverse perspectives at the heart of the research questions.

The snowball method (Collins, 2010) was used to access key informants. The initial contact was a director at the non-profit partner organized who had worked closely with the district office and school administrators to develop and institute the *Healthy Meals* program. School administrators were consequently asked to recommend a list of involved teachers and parents who may be able to speak about the *Healthy Meals* program. Potential participants were contacted directly.

Following Creswell's (2009) recommendation for minimal sample size for case study designs, the goal was to interview 3-5 participants from each strata of the sample: school administrators, classroom teachers, food service staff, parents, and non-profit staff members. In total, 19 individuals were interviewed about the *Healthy Meals* program, as illustrated in Table 3.1. Interviews were recorded for subsequent transcription and analysis. Each interview was followed by a memo to document immediate impressions, notable information, and ideas that emerged (Miles et al., 2014).

Table 3.1
Stakeholder Groups Represented in Qualitative Sample

	Principal and Admin Staff	Food Service	Teacher	Parent	Non-Profit Partner
Oakvale Elementary	2	1	3	2	3
Hills Middle	2	1	3	2	

Document Review. Document review focused on three types of archives: informational and marketing materials from *Healthy Meals*; school newsletter; and the community newspaper. These documents were primarily used to gather information about program history and development. As recommended by Yin (2014), these documents were also used to corroborate and augment information from the interviews, especially to understand how different stakeholders were involved in program development and implementation.

Qualitative Data Analysis. To explore the data, general and detailed readings were done of the transcripts, with marginal notes to enhance meaning and clarity for coding (Creswell, 2012; Miles and Huberman, 2014). Analysis followed a process of inductive coding (examining the data, identifying meaning from units of the dialogue, and attaching codes) (Onwuegbuzie & Combs, 2010). Finally, pattern coding was used to organize individual codes into broader themes (Saldaña, 2013), which were focused on project history and student outcomes connected to the *Healthy Meals* program. As recommended by Creswell (2012), document review and interview memos were coded using the same process. NVivo software was used to code data and develop themes across the different data sources.

Quantitative Data Collection and Analysis

Lunch Numbers Data. Analysis included lunch numbers data from two different sources. First, each school provided several months of data from 2016/2017 (the year prior to the *Healthy Meals* program) and 2017/2018 (the first year of the *Healthy Meals* program), which showed the daily number of full-pay, free and reduced-priced, and adult

lunches ordered. School staff were asked to provide several months of data from both school years to illustrate if and how the numbers changed over the course of each school year. Hills Middle staff provided lunch numbers from the months of September, November, and March from both school years. In the case of Oakvale Elementary, the office staff was only able to retrieve the months of February and March for both years. Second, district-level lunch numbers data, which combined meals served from both the elementary and middle schools, was also included in the analysis. This data spanned the previous 5 years and showed monthly full-pay, free and reduced-priced, and adult lunches served. Table 3.2 is a data implementation matrix illustrating the use of multiple lunch numbers data sources.

Table 3.2
Lunch Numbers Data Implementation Matrix

Source	Months/Years Included in Data Source	Types of Data
Oakvale Elementary Lunch Reports	▪ 2016/2017: February, March ▪ 2017/2018: February, March	▪ Daily number of full-pay, FRL, and adult lunches ordered
Hills Middle Lunch Reports	▪ 2016/2017: September, November, March ▪ 2017/2018: September, November, March	▪ Daily number of full-pay, FRL, and adult lunches ordered
District-Level Lunch Reports	▪ All months from 2012/2013-2017/2018	▪ Monthly number of full-pay, FRL, and adult lunches ordered

Quantitative Data Analysis. Descriptive analyses, graphical representations, and statistical tests were done to examine changes in student and staff participation in the school lunch program between 2016/2017 and 2017/2018.

Analysis of Student Lunch Numbers Data. Descriptive analysis included total student participation, participation separated by school and sub-group of students (full-pay and FRL). Statistical tests were used to assess the significance of the observed

changes in student lunch participation between the 2016/2017 and 2017/2018 academic years. Independent Samples T-Tests were used to analyze the significance of the difference in mean number of full-pay and FRL lunches ordered each day from both schools for all months included in the analysis.

Analysis of Adult Lunch Numbers Data. Descriptive analysis compared mean number of lunches ordered each month for adults from both schools for all months included in the analysis.

Findings

This section explores findings related to the research questions. First, it discusses the factors that supported the school district in changing the school food program. Second, it explores student outcomes connected to the new lunch program, including perspectives from a broad range of stakeholders. The interviews and lunch numbers data revealed a range of outcomes for students connected to the new *Healthy Meals* program. Student outcomes are presented in the following sections as behavioral outcomes, attitudes and food preferences, and learning potential. Staff and parent perspectives include participation in the school meal program and adult perceptions of school food. Finally, findings related to potential program improvements include portion size, cafeteria logistics/timing, and unequal student food choices. Table 3.3 summarizes the findings presented in the following sections.

Table 3.3
Summary of Student and Staff Outcomes

Student Outcomes	Staff and Parent Outcomes	Areas for Improvement
Behavioral ▪ Increased participation in school meal program ▪ Decreased food waste ▪ Increased energy levels ▪ Healthier Food choices Attitudes and Food Preferences ▪ Improved perception of school food ▪ Willingness to try new foods	▪ Increased staff and teacher participation in school meal program ▪ Improved perceptions of school food by staff and parents	▪ Portion size ▪ Cafeteria logistics/timing ▪ Unequal student food choices

Supporting Factors for *Healthy Meals* Initiative

There are complex logistical and institutional barriers to revolutionizing school food. School kitchens may not be equipped with the tools, manpower, relationships with farmers, or knowledge to cook from scratch. In the case of the Mountain City School District, for example, neither school has a working kitchen equipped to prepare scratch-cooked meals. In addition, the school meal program had never been profitable, so there was not funding available to use for new purchasing agreements or kitchen updates. Interviews revealed two key factors that made it possible for the district to overcome these barriers and institute a healthier school meal program: broad stakeholder support and a relationship with a non-profit community partner.

Broad Stakeholder Support. The new lunch program was started through the impetus and interest of stakeholders at various levels, including the non-profit FTS partner FarmWorks, the District Superintendent office, school leadership, food service directors, and school parents. The ability of FarmWorks staff to build and foster broad stakeholder support was fundamental to the development and successful implementation

of the program. At the level of the Mountain City School District, the Co-Director of FarmWorks had fostered a relationship with the District Superintendent for several years, encouraged her interest in healthy school food, and eventually worked together with her to develop and implement the program. “It was easy for me to work with that school district,” the Co-Director explained, “because I knew all the players. And if I didn’t know all the players, there’s a good chance that either the Superintendent had a relationship with them or I had a relationship with them. And so the decisionmakers and the heavy hitters could all be brought along in the process over a year.”

In order to get broad buy-in among all stakeholder groups, particularly parents, FarmWorks and the Parent Teacher Clubs at both schools held meetings with groups of parents to identify their preferences in a meal program. One of the parents I interviewed, who was also the president of the Parent Teacher Club, explained: “And so just finding out more information from people, teachers and the students and the parents, what they were looking for. So that helped break that down, but it was a slower process, but it was a huge process in helping everyone feel more comfortable with it.” The groups also engaged parents, students, and school staff through tastings at school events that compared current meal offerings with scratch-cooked meals provided by the high school food service program. Once parents, students, and teachers had seen and tasted the difference in the quality of the food, “it was an amazing turn-out from then on.”

Non-profit Partner Relationship: In addition to facilitating broad stakeholder support for the new lunch initiative, FarmWorks provided other key supports for the *Healthy Meals* program. In the development phase of the initiative, FarmWorks hired an

outside consultant to conduct a feasibility study, which convinced stakeholders that the project would work financially for both districts. A number of stakeholders felt that this was key to developing innovative vending agreement with the Joint Union High School District kitchen and for getting buy-in from decisionmakers.

As the *Healthy Meals* program was unveiled, FarmWorks played a key role in supported the success of the initiative at both schools by doing all the branding, marketing, and outreach for the *Healthy Meals* program. This included flyers that were sent home to parents and menu templates for both schools. In addition, the food procurement specialist at FarmWorks maintains an on-going relationship with the food service director at the Joint Union High School District. She facilitates farm-direct relationships for local purchasing, provides scratch-cooked meal ideas, assists with food transport, and helps the food service director to organize meal planning.

Due to the success of the *Healthy Meals* program, FarmWorks has been asked to provide an information session to a statewide network of school food service providers. "I think our big message is," the Co-Director of FarmWorks explained, "you as a food service director can do this, but you should be looking for partners in the community, like a non-profit, like the public health department, like the farm bureau, people that already have heavily vested interest in seeing you achieve your goals of fresh food in school meals for kids."

Student Behavioral Outcomes

Behavioral outcomes for students included increased school meal participation, decreased food waste, increased energy levels, and healthier food choices.

Increased School Meal Participation. One of the clearest student behavior outcomes was connected to a drastic increase in school meal program participation. All stakeholders at both schools recognized the exponential increase in overall lunch program participation with the *Healthy Meals* initiative. “Once students saw what was being served,” a school administrator stated, “the numbers skyrocketed.” Teachers at the middle school reported that numbers went from 2-3 students ordering lunch per day in their classrooms to 15-20 students taking lunch every day. “The difference has been really amazing,” one teacher stated. A teacher at the elementary school explained, “Families I’ve known who have always done cold lunch have let their kids have their hot lunches three to five times every week this year. So I’ve seen a huge difference.”

The lunch numbers data at both the school- and district-levels clearly supported this finding. According to district-level data that includes both schools, a total of 23,778 lunches were ordered in the 2016/2017 school year. This number more than doubled to 53,140 total lunches ordered in the 2107/2018 school year when the program was implemented. Figures 3.1 and 3.2 illustrate the break-down for various months at both schools.

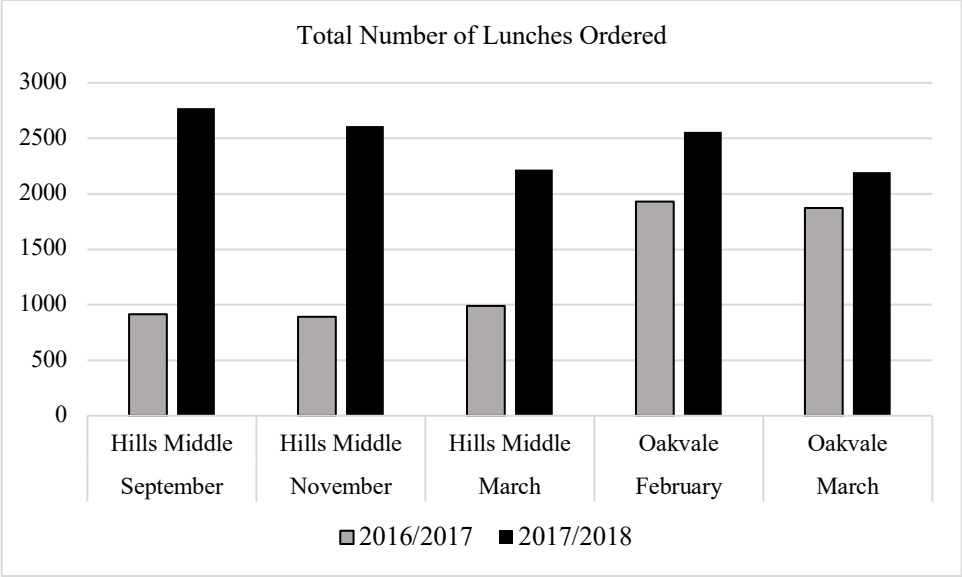

Figure 3.1. Total number of lunches ordered at each school for the months included in the lunch numbers analysis.

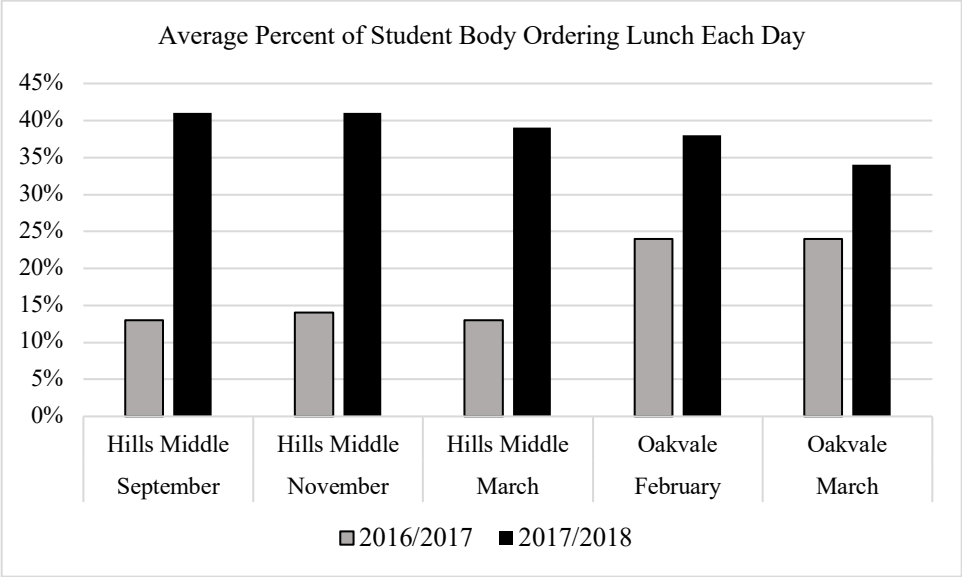

Figure 3.2. Average percent of student body ordering lunch each day at both schools for the months included in the lunch numbers analysis.

As evident from Figures 3.1 and 3.2, there was a greater increase in school meal program participation at the middle school level. This was also supported by qualitative

findings. Interview participants from Hills Middle highlighted the change in meal program participation among the older grades, particularly among the seventh and eighth graders. “Before,” the administrative staff member who gathers the lunch numbers stated, “the upper grades didn’t used to order lunch, but now the eighth grade is one of the grades with the most students ordering. The eighth grade never ordered before, it was too embarrassing.”

Free and Reduced-Priced Lunches: Interview findings pointed specifically to the lunch program participation of the students who qualify for free and reduced-priced lunch (FRL). Among this population, teachers particularly at the middle school level recognized that a greater proportion of students eligible for FRL were actually ordering lunches with the new meal program. “There are around 70-80 kids eligible for free and reduced lunch,” one teacher explained. “Previously, many of them were not even taking it. Now it’s sold out every day.”

The lunch numbers data at both the school- and district-levels also supported this finding. According to district-level data that includes both schools, a total of 15,806 FRL lunches were ordered in the 2016/2017 school year. This number more than doubled to 29,825 total FRL lunches ordered in the 2107/2018 school year. Figures 3.3 and 3.4 illustrate the school-level data.

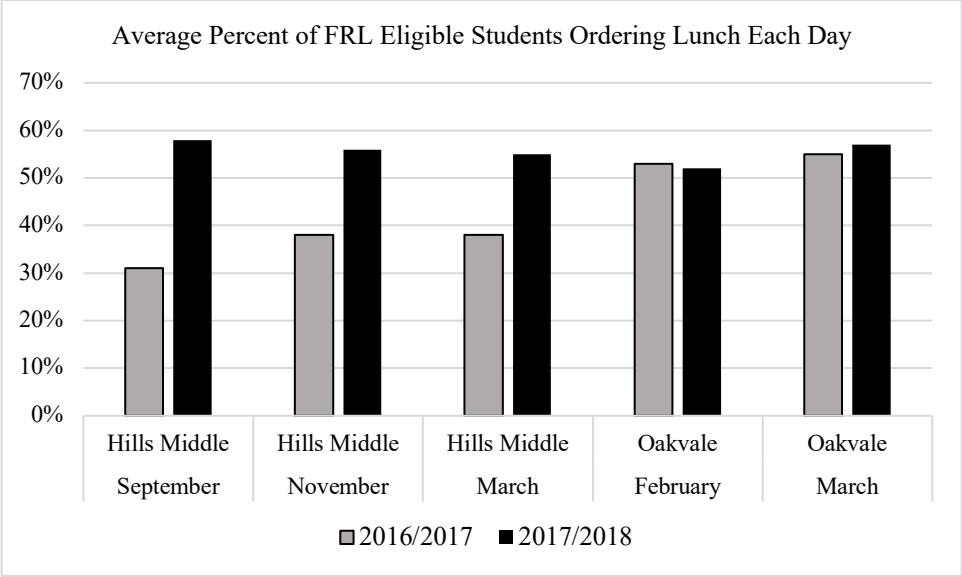

Figure 3.3. Average percent of FRL eligible students ordering lunch each day at both schools for the months included in the lunch numbers analysis.

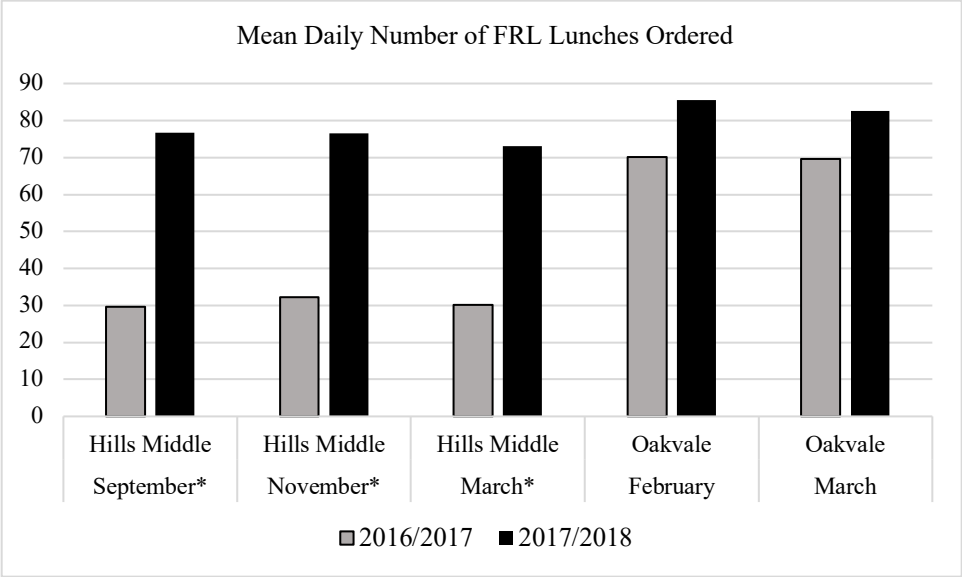

Figure 3.4. Mean daily number of FRL lunches ordered at each school for the months included in the lunch numbers analysis. Asterisks indicate statistically significant differences.

Independent-samples t-test analyses were conducted to compare the mean number of FRL lunches ordered each day in 2016/2017 and 2017/2018 during the months included in the data. Results demonstrated a significant difference when comparing the means from the first year of the *Healthy Meals* program with the previous year for all three months of Hills Middle data. There was a significant difference in the mean number of FRL lunches ordered each day in September 2016 (M=29.60, SD=5.81) and September 2017 (M=76.73, SD=8.44); t (31.78)=20.21, p<.001. Similarly, there was a significant difference in the mean number of FRL lunches ordered each day in November 2016 (M=32.33, SD=5.43) and November 2017 (M=76.56, SD=11.71); t (24.00)=14.54, p<.001. Results also indicate a statistically significant difference in the analysis from March 2017 (M=30.50, SD=4.89) and March 2018 (M=72.63, SD=10.10); t (20.13)=15.42, p<.001. However, analyses did not reveal a statistically significant difference when comparing the FRL means from the Oakvale Elementary data for either of the months included in the study.

The significant change in the number of FRL ordering at the middle school level, as compared to the elementary level, may be connected to the stigma that was previously associated with the school lunches that appears to have been more prominent for the older grades. This point is discussed further in the findings related to perceptions of school food.

Full-Pay Lunches: Even greater differences were seen in the meal program participation of students who are not FRL eligible, who are charged $3.50 per lunch. Parents whose children were not FRL eligible reported that their children had never

ordered lunches previously but now ordered them frequently. “This year is the first time he ever had ‘hot lunch,’” explained one parent. “Now he eats it about 4 times per week.”

Teachers also reported that previously no paying students in their classrooms ever ordered lunch. With the new lunch program, students from all socioeconomic backgrounds ordered lunch. Several teachers spoke at length to this point:

> Last year, the students that ordered lunch were exclusively the kids of single mothers. They were low-income kids, they took the lunch because they were subsidized. It’s no longer something for the “poor kids.” Now students are happy to have their hands in the air to order lunch. It’s equalized food. (Teacher, Hills Middle School)

> I know who’s rich and poor, and everyone eats lunch here. This is a big change. All the poor kids were in line last year. Now moms that stay at home pay for lunch, moms opt for the school lunch. These are the same people who wouldn’t have paid for the lunch last year. (Teacher, Hills Middle School)

> I notice a huge difference in the number of kids that sign up. It used to be two or three kids a day, and it was only the kids on the free and reduced plan. And now it’s both, it’s the free and reduced lunch kids and it’s also just kids that want that pizza or want that burger. (Teacher, Oakvale Elementary)

The quantitative data also supports this finding, as illustrated in Figures 3.5 and 3.6.

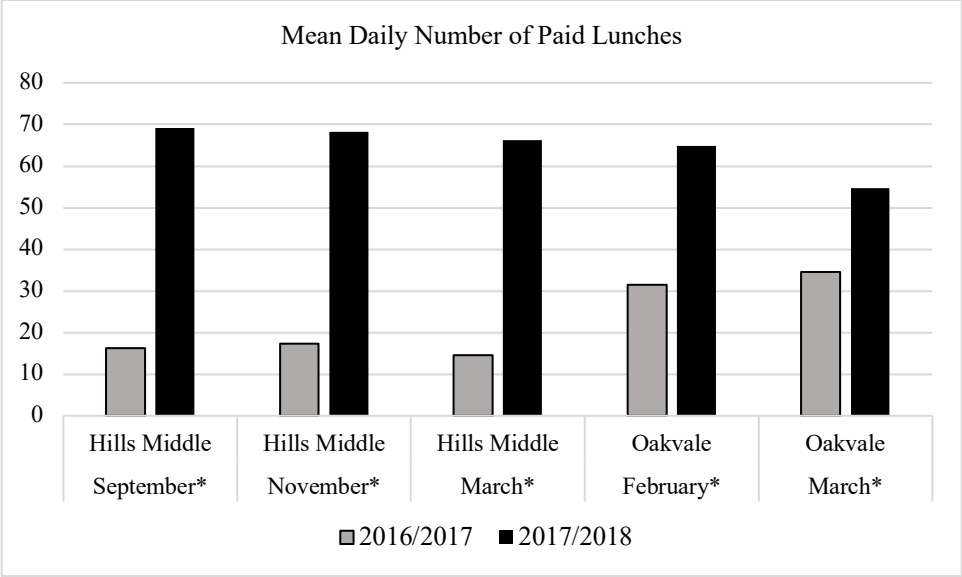

Figure 3.5. Mean daily number of paid lunches ordered at each school for the months included in the analysis. Asterisks indicate statistically significant differences.

Independent-samples t-test analyses were conducted to compare the mean number of full-pay lunches ordered each day in 2016/2017 and 2017/2018 during the months included in the data. Results demonstrated a significant difference when comparing the means from the first year of the *Healthy Meals* program with the previous year for all three months of Hills Middle data. There was a significant difference in the mean number of paid lunches ordered each day in September 2016 (M=16.20, SD=3.67) and September 2017 (M=69.05, SD=8.74); t (23.93)=24.39, p<.001. Similarly, there was a significant difference in the mean number of paid lunches ordered each day in November 2016 (M=17.28, SD=4.68) and November 2017 (M=68.33, SD=14.77); t (20.37)=13.98, p<.001. Results also indicate a statistically significant difference in the analysis from March 2017 (M=14.59, SD=3.85) and March 2018 (M=66.19, SD=11.37); t (17.52)=17.44, p<.001.

In the case of full-pay lunches, analyses also demonstrated a significant difference in mean daily paid lunches ordered between 2016/2017 and 2017/2018 at Oakvale Elementary. There was a significant difference in the mean number of paid lunches ordered each day in February 2017 (M=31.47, SD=6.24) and February 2018 (M=64.88, SD=13.98); t (21.60)=9.08, p<.001. Similarly, there was a significant difference in the mean number of paid lunches ordered each day for the following months of March 2017 (M=34.50, SD=7.50) and March 2018 (M=54.69, SD=14.52); t (21.87)=5.00, p<.001.

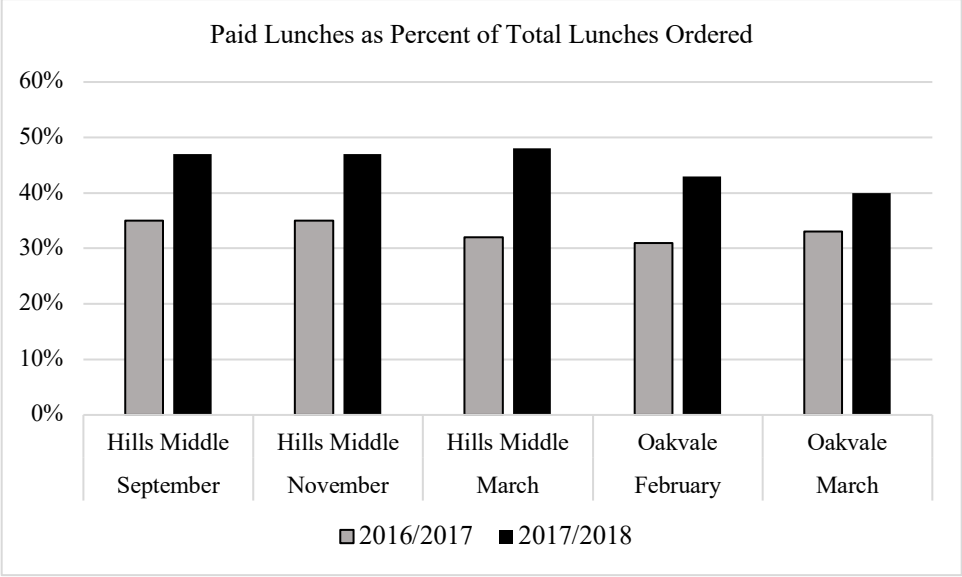

Figure 3.6. Paid lunches as percent of total lunches ordered at both schools for the months included in the lunch numbers analysis.

Due in large part to the exponential increase in paid student participation, the Joint Union High School food service program experienced a sizeable increase in revenue, operating in the black for the first time in years. The Food Procurement specialist at FarmWorks reported that this revenue increase from the vending program has given the food service

director more flexibility to increase her purchase of foods from local and regional farmers.

Reduced Food Waste. All stakeholders reported reduced waste from the school meal program. In part, this was attributed to fewer students disposing of uneaten food. Teachers and food service staff, who oversee the lunches, reported that students used to eat only a small piece of whatever was served, or they would throw away "full lunches." "Food waste," one food service staff stated, "is definitely less than last year; and much less now than at the beginning of the year." In addition, participants noted that the new serving style also reduces waste. Specifically, meals are no longer served in disposable packaging. Instead, food is served buffet style using reusable containers instead of paper or styrofoam plates. "The biggest thing that I think is an improvement," one teacher stated of the school lunches, "is that they don't come wrapped up in a piece of plastic, and that piece of plastic stuffed in the oven until it gets all puffed up, then hand that to a kid."

Energy Levels. Not all stakeholders reported noticing a difference in student energy levels and/or willingness to learn connected with the new meal program. However, several stakeholders did report noticing increased energy levels in their students or children, which they attributed to a larger meal, "increased caloric consumption," and "sustained nutrition" compared with a packed lunch. One teacher at the middle school reported the following:

> I've noticed that kids are better fed, more awake in the afternoons…We've noticed a difference in the energy level of the students. It's palpable, you can see it. For sure, it's something that the staff and teachers were

> commenting on…More kids are eating lunch, before students would go through the whole day without eating.

Food Choices. Several stakeholders reported that they have seen their students or children making a broader and healthier range of food choices that they attributed directly to the *Healthy Meals* program. Stakeholders at the school noticed that as the year progressed, students appeared to be eating more of the healthier menu options, including items like broccoli salad and fresh vegetables. School parents also noticed changes in food choices that they attributed to the new school lunches. According to one parent,

> The other day my son shocked me by saying, "I want a bigger salad," at dinner time. I was like, "Oh my God." We make salad every day, but we usually only give him a small portion. But now that they serve a side salad as part of the school meals, he seems to be eating more of it.

Student Attitudes and Food Preferences Outcomes

Attitudes and food preferences outcomes for students include perceptions of school food and willingness to try new foods.

Perceptions of School Food. Across the board, stakeholders reported that students have a completely different perspective of the school lunches since the implementation of the *Health Meals* initiative. Previously, there seemed to be a stigma and embarrassment associated with eating the school lunch, which one teacher said was "like a joke, students were making fun of it." "Previously, it was embarrassing to eat the school lunch," another middle school teacher explained. "There was some kind of reputation connected to eating the school lunch. Kids would be ashamed, they didn't like it." Another teacher stated this change simply: "There have been significant changes in the perception of food and enthusiasm around the school food. Huge changes."

Stakeholders reported that students at all grades now kept track of the lunch menu and looked forward to their favorite meals. “Now students remark on specific meals. ‘Oh, I really like this one, this one’s my favorite.’ I hear that students really like it,” reported a food service staff member at Oakvale Elementary.

Willingness to try New Foods. Both food service staff and parents noticed changes in the willingness of students to try new foods, whether in the cafeteria or at home. This willingness to try new foods ranged from vegetables to chicken drumsticks. “This program,” one middle school parent expressed, “has been amazingly effective at expanding the palettes of what kids will try, even beyond what parents would expect. The program assists parents in the way that it gets kids to try new foods.”

One food service staff member noticed that as the first year of the new lunch program progressed, students seemed more likely to try unfamiliar foods. “Some children are not used to eating healthy food,” she said, “they don’t know what broccoli is. I’ve noticed that as the year has gone on, more children are willing to try more foods, then they end up liking what they try.”

Staff and Parent Outcomes

Staff and parent outcomes included increased staff participation in the school meal program and improved adult perceptions of the school food.

Staff Participation in School Meal Program. While “the staff never touched the food last year,” during the 2017/2018 school year adults ordered meals every day from the *Healthy Meals* program. As one teacher explained, “I never ate the school food last year. I eat it now, I order it, so I figure if I’m going to spend four dollars, I choose certain

days, depending on the menu. I like the quesadillas, and they have some really good burritos; and the broccoli salad, that's my favorite, it's really good."

The lunch numbers data at both the school- and district-levels also supported this finding. According to district-level data that includes both schools, only one adult lunch was ordered in the 2016/2017 school year. In the 2107/2018 school year, a total of 491 adult lunches were ordered. Table 3.4 breaks this down for the two schools.

Table 3.4
Total Adult Lunches Ordered

	Hills Middle School			**Oakvale Elementary**	
	Sep	Nov	Mar	Feb	Mar
2016/17	1	0	0	0	0
2017/18	13	27	15	15	21

Staff and Parent Perceptions of School Food. Both parents and school staff reported a drastic shift in their perceptions of the quality and content of school food. These stakeholder groups consistently used the terms "real" and "fresh" to contrast the new school lunches with what was previously served. "Real food is served now," a school administrator stated. "Before they served mystery meat, now more fruits and vegetables, not the mush stuff." Teachers felt that having the new lunch option was "wonderful for the kids." "I call it fresh lunch," a teacher stated, "I don't like to call it a hot lunch. Hot lunch used to be wrapped in plastic, and now they come with the most beautiful green salads, pasta salads, and local pizza."

Both parents and staff reported high levels of parent satisfaction with the new lunch program. "I love that my son and his peers want the lunch and they eat it," one mother shared. "I love that everything is fresh, and it's presented nicely." Another parent

had observed the middle school lunch and "loved how happy the kids seemed." Staff at the schools had also noticed a "huge change" in parent satisfaction. They reported hearing from parents that "they are thrilled that their kids are eating good, healthy food."

Current Challenges and Areas for Improvement

Interview participants shared their perspectives on current challenges and areas for improvement in the *Healthy Meals* program. These findings may be helpful for planning and implementation of new lunch programs in other districts.

Portion Size. Stakeholders in the middle school level expressed concern that the portion size for the new scratch-cooked meals was not adequate for older students or adults. Currently, the portion sizes and menu offerings are identical for students and adults, and they don't vary by grade level. Several teachers mentioned that they would order lunch more frequently if there were additional lunch options designed especially for adults.

Logistics and Timing. A number of stakeholders reported that the success of the program overwhelmed the cafeteria with an unexpectedly high number of students ordering lunch, especially at the beginning of the year. Because serving so many students takes longer, students that decided to eat the school lunch often do not have enough time to eat and have recess. "At the beginning of the year," one parent explained, "my son missed his entire recess if he ate the school lunch. There have been growing pains to adjust to the demand, it was more than anyone expected." Stakeholders recognized that this was an adjustment year for the food service staff.

Unequal Food Choices. A final concern was that students from economically disadvantaged backgrounds may still not be accessing the healthier food options offered with the *Healthy Meals* program, as these students may be less likely to consume the healthiest menu offerings. Although only one interview participant shared this concern, she was a food service staff member who has consistent daily experience of her students and their cafeteria behaviors. She described her concern in the following manner:

> So many of the kids on free and reduced lunch don't actually eat the lunches, because they're not familiar with the foods. They're not used to healthy food, and those are the kids that we're trying to help the most…Those kids don't know what to expect every day, their moms don't tell them what's on the menu. That's the biggest issue, we need to do something about it…The kids that eat healthy at home are more likely to eat the healthy foods served at school, because they're used to it and know what it is.

This reflection may point to an additional layer of student outcomes, and it underscores the importance of combining qualitative accounts with numerical data such as lunch numbers reports.

Discussion

This mixed methods research of preliminary outcomes connected to the *Healthy Meals* lunch program revealed numerous outcomes for students and staff. Most notably, overall student participation in the lunch program increased significantly. This increase in participation was particularly significant for students not eligible for FRL, with a marked increase in the number of paid lunches ordered each month. According to teachers and staff at both schools, this shift noticeably changed ("equalized") the demographics of student participation in the school meal program. Student attitudes towards the school

meal program also shifted dramatically, in line with increased participation. All stakeholder groups, particularly middle school participants, reported that there was no longer stigma surrounding school lunch participation. School and parent stakeholders also reported that students seemed more willing to try new foods.

Adult perceptions of the school food also changed with the new meal program. Teachers and staff reported that the change in the quality of food was like "night and day," and adult lunch orders increased to a steady rate of 2-3 each day at both schools. While participants shared areas for future improvement in the *Healthy Meals* program, this research demonstrates overwhelmingly positive responses to the initiative.

This research confirms findings from existing studies and points to areas for further investigation in the area of school food improvements and FTS program outcomes. In the area of student behavioral outcomes, there is a robust body of research that points to increased participation in school meal programs and healthier food choices when students have access to fresh fruits and vegetables and are also exposed to integrated nutrition programming that includes hands-on learning opportunities such as school gardening (A. Evans et al., 2012; Hayes et al., 2018; A Joshi & Azuma, 2008; Knai et al., 2006; Savoie-Roskos et al., 2017; Yoder et al., 2014). According to a summary of FTS program impacts, increase in school meal participation rates ranges from 3% to 16% due to FTS programming (A Joshi & Azuma, 2008). In this study, increases in school meal participation rates by both students and adults, especially at the middle school level, were significantly higher.

By incorporating the qualitative perspectives of parents and classroom teachers, this research added new layers to our understanding of student behavioral outcomes connected to school food, including stigma connected to school meal participation and student divisions based on socioeconomic status. The issue of peer perceptions, stigma, and student socioeconomic background as contextual factors for NSLP participation has been examined in one study of high school students (Mirtcheva & Powell, 2009). This paper suggests that further research is needed in this area, particularly among middle school students, to understand how school food intersects with psychosocial development of students and to promote equal access to healthy school meal programs. One existing evaluation of an integrated nutrition program that included both elementary and middle school students found that student attitudes towards school food and fresh produce only changed at the middle school level (Rauzon, Wang, Studer, & Crawford, 2010), further suggesting that psychosocial development may be an important aspect of school food participation.

Although food waste studies do not generally point to reduced waste in the context of increased fruit and vegetable access alone (Schwartz et al., 2015; Smith & Cunningham-Sabo, 2014; Yoder et al., 2014), there is some evidence that school food waste decreases in the context of integrated nutrition programming (Hayes et al., 2018; "The Farm to School Census," 2015). While food waste studies often focus on student plate waste, this research highlighted decreased food waste due to reduced food packaging when scratch-cooked meals were served instead of pre-packaged lunches.

Existing literature also supports the findings of changes in student attitudes and food preferences connected to FTS programs, in this case perceptions of school food and willingness to try new foods. In a three-year prospective study of the School Lunch Initiative in Berkeley Unified School District, which integrates hands-on nutrition education with system-wide changes in school food services, researchers found that students from schools with highly developed program components had a higher preference for fruits and vegetables, and middle school students had more positive attitudes about school food and fresh produce (Rauzon et al., 2010). Student attitudes and food preferences, including the willingness to try new foods that was reported in this study, are often studied in the context of school nutrition programs as an important mediator of fruit and vegetable consumption (Berezowitz et al., 2015; Yoder et al., 2014).

Both qualitative and quantitative findings in this paper demonstrate substantial increases in adult (staff and teacher) participation in the school meal program, accompanied by qualitative reports of improved perceptions of the school lunch quality by teachers and parents. Existing studies have not examined adult participation in school meal programs or perceptions of school food. This is an area for further investigation, as it is relevant to school meal program profitability as well as role-modeling for students.

Finally, findings point to areas for potential program improvement, including logistics of meal timing and unequal food choices made by students. Participants reported that with increased participation in the school lunch programs, long waiting times prevented some students from attending recess. National recommendations offer guidelines pertinent to the timing of school lunches. Both the USDA and Centers for

Disease Control and Prevention recommend policies that allow students at least 25 minutes of seated lunch time, which research shows can improve dietary intake and reduce food waste (Cohen et al., 2016; Hayes et al., 2018). An additional recommendation backed by research is to improve healthy consumption and reduce waste by offering recess before lunch (Price & Just, 2015).

Further research is needed in the area of unequal food choices made by students, specifically the concern mentioned by one participant that students from lower socioeconomic groups consumed fewer healthy options from the new school lunch program. Existing literature does support the observation that children's eating patterns are affected by socioeconomic and sociocultural contexts, including behaviors, attitudes, meal preferences, and time constraints of parents (Patrick & Nicklas, 2005). Targeted theory-based nutrition education interventions may increase the self-efficacy of low-income children and support healthier food choices (Zimmerman & Keller, 2016).

Research Limitations

A fundamental potential limitation of the case study design is lack of generalizability (Creswell, 2012; Yin, 2014). This may be especially relevant for single instrumental case study designs. An additional analytic limitation is that the unit of analysis for this study—a school with a comprehensive FTS program—does not correspond to the units of analysis in the majority of existing research, making it more difficult to compare and contrast results (Yin, 2014). Although this study focused on student outcomes, data was collected after only one year of implementation of a new lunch program and student perspectives were not included in the data collection.

In addition, this research was conducted in relatively homogenous school environments. There would be significant additional barriers to successfully implementing new meal programs with diverse student bodies, where family cultures and food eating patterns vary widely. In these contexts, it may be much more difficult to achieve broad student acceptance of a new meal program.

Implications

As policy interventions move away from mechanistic solutions targeted at individual behavior change, schools have emerged as possible intervention points for improving childhood health and well-being for children, their families, and the broader community (Vallianatos, Gottlieb, & Haase, 2004). Student outcomes connected to improved school food environments may include increased participation in school meal programs, decreased food waste, and willingness to try new foods. There are implications in these findings for broader student outcomes connected to social-emotional wellbeing of students, physical nutrition and health, and academic engagement. In addition to simply increasing access to healthier foods through improved dietary choices in school meal programs, this research supports the belief that changing school food systems has the potential to integrate systemic, structural, environmental, and behavioral changes that lead to improved student health and well-being (Ashe & Sonnino, 2013).

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CHAPTER 4

Community Partner Relationships and Family Engagement in Farm-to-School

Introduction

In recent years, researchers and policy-makers from the public health and education sectors have created shared frameworks to explore the relationships between health and education. In 2013, the US Centers for Disease Control and Prevention (CDC) together with the Association for Supervision and Curriculum Development (ASCD) worked with a group of experts from education, public health, and academia to develop a model to guide the role of schools in strengthening the physical and emotional health of students (Lewallen et al., 2015). The resulting Whole School, Whole Community, Whole Child (WSCC) model, described as "a collaborative approach to learning and health," illustrates how to create a school environment that supports health and learning by focusing on core areas including health education, nutrition environment, physical environment, and community involvement. In this model, the school is positioned as an integral part of the community, with an emphasis on multisectoral collaboration.

One result of increased national recognition of the connections between schools, communities and childhood health has been a marked growth in farm-to-school (FTS) programs across the country. FTS programs "enrich the connection communities have with local, healthy food and food producers by changing food purchasing and educational activities at schools" (A Joshi et al., 2014, p. 1). Through interventions that improve school food and provide hands-on food, farm, and nutrition-related education, FTS programs address many of the target areas described in the WSCC including health

education, nutrition education, physical environment, and physical activity. Research has illustrated positive health, school climate, and academic outcomes for students involved in FTS programming (Ashe & Sonnino, 2013; Bagdonis, Hinrichs, & Schafft, 2009; Gorski, 2013; Anupama Joshi & Ratcliffe, 2012; Turner, Eliason, Sandoval, & Chaloupka, 2016; Vallianatos, Gottlieb, & Haase, 2004).

Two core areas of the WSCC model are community involvement and family engagement, both of which are often fundamental components of FTS programming. The WSCC describes community involvement as partnerships created between community groups and schools to support student learning, development, and health-related activities. The WSCC model is directed at the "whole school, with the school, in turn, drawing its resources and influences from the whole community" (Lewallen et al., 2015). Family engagement, in the WSCC framework, consists of relationships between school staff and families that reinforce student health and learning in multiple settings. A body of existing research supports the WSCC focus on community involvement and family engagement by describing the broad positive educational and social outcomes for students (Bryan, 2005; Dotson-Blake, 2010; M. G. Sanders, 2001). In this article, FTS programs are examined as an avenue to enrich community partner relationships and family engagement at schools described by the WSCC. Although there are clear parallels between the model and FTS programming, this model has not previously been used in FTS literature.

The majority of research on FTS has focused on health and academic outcomes for students, and few existing articles have explored FTS programming as it relates to

community and family involvement in schools. Existing research points to the importance of foundational community partnerships to embed and sustain FTS programming in schools (Cirillo & Morra, 2018). This article explores how FTS programs may also provide direct opportunities for community partner and family involvement in schools.

This study is an attempt to investigate FTS as a strategy that responds to the WSCC model, which highlights "the school as an integral part of the community" (Lewallen et al., 2015, pg. 730). It is a broad exploration of the relationships between schools, families, and community partners that are at the center of FTS programming. The article is guided by the following questions: What is the nature and extent of community partner and parent involvement in FTS programming? What factors strengthen community partner and parental involvement FTS programming? By investigating the relationships created through FTS programming, researchers, policy makers, and program developers can consider the potential implications for students, schools, families, and communities.

FTS community partner involvement and family engagement were examined in this study through case study research at an elementary school in northern California that has a high-performing, comprehensive FTS program supported by partnership with a local non-profit organization. The case study allows for in-depth description of a contemporary, complex social phenomenon within its real-world context (Creswell, 2012; Yin, 2014). This approach supported data collection and analysis that incorporated the perspective of stakeholders at the school and community levels. By conducting a single instrumental case study, the research was not influenced by multiple FTS program

strategies across different school environments but rather described community partner involvement and family engagement within a comprehensive and well-supported FTS program.

Review of Literature

Community Involvement and Family Engagement

Community involvement and community-school partnerships are broadly defined in the literature as relationships between schools and a variety of both formal and informal organizations and institutions in the community. Sanders (2001) developed an overarching definition of community-school partnerships as "connections between schools and community individuals, organizations, and businesses that are forged to promote students' social, emotional, physical, and intellectual development" (p. 20). This definition is extended to include families in the overlapping spheres of influence model created by Joyce Epstein of the National Network of Partnership Schools. This model illustrates the simultaneous influence of schools, families, and communities as major institutions that socialize and educate children (Epstein, 2001). Strong relationships between these spheres, argues Epstein, serve to "engage, guide, energize, and motivate students to produce their own successes" (Epstein, 2001, p. 8). Other authors have referenced this model in their research on community-school partnerships (Dikkers & Catapano, 2013; M. G. Sanders, 2001; Sheldon, 2003). Sheldon (2003), for example, explains that "greater overlap among the three contexts means that schools are more familylike, families are more school-like, and communities support schools, students, and families" (p. 3).

A body of research suggests that issues surrounding educational achievement and social and emotional well-being require the collaboration of schools, families, and the wider community (Bryan, 2005; Dikkers & Catapano, 2013; Dotson-Blake, 2010; Gordon & Louis, 2009; M. G. Sanders, 2001; M. G. Sanders & Lewis, 2005; M. Sanders & Harvey, 2002). Schools, researchers argue, need input from multiple stakeholders to provide for increasingly diverse student populations. Research also shows that family and community members can enhance learning and achievement for low-income students (Dearing, Kreider, Simpkins, & Weiss, 2006) and infuse the culture and language of diverse students and families within the school (Sheldon, 2003; Tunison, 2013).

While community-school connections literature often integrates the areas of community involvement and family engagement, some authors do separate these spheres, with more literature dedicated to types of outcomes connected to family engagement. The WSCC model describes family engagement as "families and school staff work[ing] together to support and improve the learning, development, and health of students" (Lewallen et al., 2015, p. 734). Research points to several specific areas of family engagement that are connected to increased student achievement. Family engagement can support student learning at home through interactive homework, conversations about school, reading, and reinforcement of instructional strategies (Bailey, 2006; Fan & Williams, 2010; Fantuzzo, McWayne, Perry, & Childs, 2004; Sheldon & Epstein, 2005). School-home communication has also been shown to increase student academic outcomes, including when parents visit schools or attend a school event, engage in communication exchange, and attend parent-teacher meetings (Bailey, 2006; Cox, 2005;

Dearing et al., 2006). Research also links parent volunteering in the classroom or on field trips to measures of student achievement (Dearing et al., 2006; Fan & Williams, 2010; Lee & Bowen, 2006; McBride, Schoppe-Sullivan, & Ho, 2005). Additional areas of family engagement include leadership and decision making roles at school, high parent expectations, and programs that train parents to support learning at home (Bailey, 2006; Dearing et al., 2006).

In addition to increased academic achievement, research shows that family engagement in schools also has health benefits for students. According to the CDC's *Parent Engagement: Strategies for Involving Parents in School Health* (2012), "the relationship between schools and parents cuts across and reinforces children's health and learning in multiple settings—at home, in school, in out-of-school programs, and in the community" (Centers for Disease Control and Prevention, 2012, p. 6). Research shows that family engagement in schools may also be linked to improved student behavior, enhanced social skills, and a reduction in unhealthy behaviors including tobacco, alcohol, and other drug use (Epstein & Sheldon, 2002; Nokali, Bachman, & Votruba-Drzal, 2010; Storr, Ialongo, Kellam, & Anthony, 2002).

A smaller body of research specifically examines types of community involvement and links to increased student achievement and well-being. Preston (2013) describes community involvement in school as "any student-focused school-community connection that directly or indirectly supports the students' physical, social, emotional, and intellectual needs" (p. 416). School-community collaborations, according to this author, include connections with community agencies, businesses, non-profit

associations, and other community groups. Examples of community involvement include field trips, community volunteers at school, community member attendance at school-sponsored events, fundraising activities, and service-learning activities. Preston (2013) argues that community resources that enhance community involvement in school include programs, facilities, finances, and local norms and beliefs.

Sanders (2003) provides more definition by describing four prevalent types of community-school partnerships—defined by the type of community partner involved—and discusses the factors that influence their success. Business partnerships focus on school improvement and student achievement, including mentorship for individual students, donations of school equipment, and funding awards. University partnerships focus on professional development, improving educational initiatives, and expertise in evaluation of school initiatives. Service learning partnerships focus on community and civic participation, including field experiences that provide students opportunities to contribute to initiatives that address social and environmental problems or other community needs. Goals for these types of partnerships including building stronger communities, fostering engaged citizenship, and making traditional classrooms more vibrant. The final type of partnership described by Sanders (2003) is school-linked service integration, which connect schools, social service agencies, and health providers in an attempt to provide efficient services to children and families. In the case of each type of partnership, Sanders (2003) argues that successful collaborations require that schools and the community partner have "collaborative skills, common goals, structures for inclusive decision making, and time for reflection and evaluation" (p. 176).

FTS and the WSCC Model

This paper contextualizes the importance of community partner involvement and family engagement in student health through the WSCC model, which is used as a conceptual framework. Figure 4.1 is a visual representation of the WSCC model, designed by the CDC and ASCD (Lewallen et al., 2015).

Figure 4.1. The WSCC model (Lewallen et al., 2015).

The outer ring includes the core components of the model, including several intervention areas that are key aspects of comprehensive FTS programming. Specifically, improvements to health education, nutrition environment, and physical environment are outcomes of FTS programming. Research shows that FTS outcomes also address other components of the WSCC model, including social and emotional climate, employee

wellness, and physical activity. Table 4.1 illustrates how FTS outcomes are directly connected to many of the core components of the WSCC model. The focus of this study is the components of community involvement and family engagement, which are largely missing from the FTS literature.

Table 4.1
Connections between WSCC Components and FTS Programming.

WSCC Component	Links to Comprehensive FTS Programming Activities and Outcomes
Health Education	Comprehensive FTS programming includes (A Joshi et al., 2014): • FTS includes experiential learning about food, agriculture, and nutrition education including farm field trips, cooking classes, and harvesting. • FTS includes lessons about food, food production, and how food contributes to human health. • Research shows that FTS programs may directly increase knowledge and skills in nutrition, agriculture, and food literacy (Heather Graham & Zidenberg-Cherr, 2005; Klemmer et al., 2005; Morgan et al., 2010).
Physical Activity	Comprehensive FTS programming may increase physical activity for students, primarily through school gardening activities (Burt et al., 2017; A Joshi & Azuma, 2008).
Nutrition Environment and Services	Comprehensive FTS programming includes the buying, preparing, serving, and promoting of local foods and food products in schools, which increases access to fresh fruits and vegetables (Anupama Joshi & Ratcliffe, 2012).
Social and Emotional Climate	Comprehensive FTS programming may lead to changes in curricular and social learning environments that create avenues for students to connect with nature, foster peer relationships, and develop a sense of school pride. Psychosocial benefits may include increased personal responsibility, sense of belonging, and motivation (A Joshi et al., 2014; Anupama Joshi & Ratcliffe, 2012; Ozer, 2007; Ratcliffe, 2007; Thorp, 2006; D. Williams & Brown, 2013).
Physical Environment	Comprehensive FTS programming includes school-based gardens or orchards, which enrich the outdoor school environment (A Joshi et al., 2014).
Employee Wellness	Comprehensive FTS programming may be connected to positive changes in teachers' diets and lifestyle; and improvements in food service staff and morale (Izumi, Alaimo, & Hamm, 2010b; Schmidt & Kolodinsky, 2006).
Family Engagement	Comprehensive FTS programming may be connected to increased parent engagement in early childhood educational opportunities (Hoffman et al., 2017). **This study examines this aspect of FTS programming.**
Community Involvement	Comprehensive FTS programming may increase community engagement in school food and local food systems, including local awareness of local food purchasing and

> support from parents and community for healthier school meals ("New USDA Data Show Growing Farm to School Efforts Help to Reduce Plate Waste, Increase Student Participation in Healthier School Meals Program," 2015; "The Farm to School Census," 2015).
> **This study examines this aspect of FTS programming.**

Comprehensive FTS programming, according to the "3-C" approach embraced by leaders in the FTS movement, includes interventions in three domains: the cafeteria, classroom, and community ("What is Farm to School? | Vermont FEED," n.d.). FTS programming in these domains may include procurement of local food; school gardens; and education related to food, agriculture, and nutrition (A Joshi et al., 2014). Existing research on health behavior interventions at schools supports the comprehensive FTS approach, illustrating that multi-component programs with strategies that are integrated across these environments improve outcomes for students including healthier food preferences, increased nutrition knowledge, self-efficacy, and fruit and vegetable intake (Hazzard, Moreno, Beall, & Zidenberg-Cherr, 2011; Perry et al., 2004; Taylor & Johnson, 2013). Similarly, the WSCC model emphasizes an approach that addresses the different contextual levels that shape health and education by including interdependent interventions that cut across multiple school environments. In the WSCC model, school-based interventions are nested within the broader community contexts.

Methods

Study Context and Participants

The case study site for this research was an elementary school with a comprehensive FTS program in northern California. California has pioneered the FTS movement since the early 2000's at the levels of state support, non-profit leadership, and

networks of diverse stakeholders (Feenstra & Ohmart, 2012). State support paired with other conditions in California—including the year-round growing season, robust community of small farmers, and leadership connected to the local food movement—led to rapid expansion of FTS programs (Feenstra & Ohmart, 2012).

At the state level, California Department of Education supports the goals of FTS programming. The California Health Education Content Standards for California Public Schools, adopted by the State Board of Education in 2008, outlines health and nutrition education goals for grades K-12 and states that "good health and academic success go hand in hand" (California, Department of Education, California, & State Board of Education, 2009, p.v). "Heath education," the document continues, "is an integral part of the education program for all students." The document is rooted in the idea that health education is most effective when it is taught through hands-on activities and active learning.

The California Department of Education also explicitly promotes family engagement in schools, recognizing that "parents, families, and other caring adults provide the primary educational environment for children…and can reinforce classroom learning throughout the school years" (California Department of Education, 2014, p. 3). The *Family Engagement Framework: Tools for California School Districts* (California Department of Education, 2014) outlines various types of family engagement and also provides a framework of specific actions for how districts can support family engagement. Family engagement activities include both school-initiated and family-initiated activities that take place at home, at school, and in the district. According to the

document, parent involvement is defined as “the exchange of information, purposeful interaction, and meaningful participation between parents and schools to support student learning and achievement” (California Department of Education, 2014, p. 40).

The case study school was a K-6 school with a student population of 417 and a robust FTS program in northern California. According to the California School Dashboard, 40.6% of Oakvale Elementary students are socioeconomically disadvantaged, which means that they are eligible for free and reduced-priced meals and/or have a parent or guardian who did not graduate from high school (compared to 60.5% at the state level) ("California School Dashboard," n.d.). Oakvale Elementary is located in a rural, ethnically homogenous county in northern California with a population of about 100,000 people (“U.S. Census Bureau QuickFacts,” n.d.).

Although FTS programs are unique and vary by location and school resources, comprehensive programs usually include three core elements: (a) procurement of local and regional food products; (b) gardening based at schools and preschools; and (c) education that is food and farm-related. This definition of comprehensive FTS has been adopted by the National Farm to School Network (“Benefits of Farm to School,” 2017) and many local FTS programs. Oakvale Elementary was one of the early adopter schools in the area in terms of FTS, and it has partnered with a local non-profit organization to provide FTS programming for the past 9 years. With the introduction of a new lunch program featuring local foods in the 2016-2017 school year, a school orchard, and hands-on educational programming, Oakvale Elementary has a comprehensive FTS program.

Oakvale Elementary collaborates with a non-profit community partner called FarmWorks to offer FTS programming. For the past 10 years, FarmWorks has worked to connect county families to fresh, local foods. Programs include training for aspiring farmers, a farm-based summer camp for children, gleaning program, regional farm potlucks, and a garden building program for low-income families or other local organizations. FarmWorks' Farm to School program currently partners with 27 K-8 schools in the county to increase opportunities for students to taste and experience hands-on learning with local fruits and vegetables.

The FTS programming at Oakvale is composed of a number of strategies to increase student access to fresh fruits and vegetables and hands-on experience with food, agriculture, and nutrition. Programming unfolds at local schools and farms, with the participation of food service, school administration, community volunteers, local farmers, and school parents. Programming at Oakvale Elementary includes the following components: Harvest of the Month program; farm field trips to partner farms; farmer visits; a guest chef program; an annual plant sale fundraiser; a fall garden cart; and a scratch-cooked meal program that incorporates procurement of local fruits and vegetables.

Most aspects of the FTS programming specifically target community and family involvement. The farm field trips depend on parent and community volunteers, who accompany students and also facilitate learning activities. The guest chef program features parent or community volunteers as chefs, who lead students in the preparation of food from local sources; and the farmer visits feature volunteer farmers to lead

agriculture-related activities in the classroom. Families and volunteer farms donate plants for the annual plant sale fundraiser and locally grown fruits and vegetables for the fall garden cart. The FarmWorks educational farm also offers U-Pick days for participating students, when families are encouraged to harvest vegetables at discounted cost.

Data Collection

As discussed by Creswell (2009 and 2012) and Yin (2014) the various sources of data collection typical of case studies are highly complementary, and a strong case study relies on multiple sources of evidence. Within the broader case study framework, data collection and analysis followed the qualitative mode of emergent design (Creswell, 2012), in which research questions and data collection were continuously informed by on-going research and analysis. Before conducting data collection, the research protocol was approved by the University of Vermont Institutional Review Board.

Semi-structured interviews. The in-depth interview is one of the fundamental sources of evidence in case study designs (Akgun et al., 2006; Creswell, 2012), as most case studies are about human phenomena. The model of shorter case study interviews was followed, in which interviews were composed of open-ended questions that follow a structured protocol and last no longer than an hour (Yin, 2014).

A stratified purposeful sample was used to interview key informants from the strata of (a) classroom teachers, (b) school leadership, (c) staff at the non-profit partner organization, and (d) parents (Collins, 2010; Creswell, 2012). Similar to Hazzard et al.'s (2011) study, the criteria for choosing individuals was a high level of involvement in FTS programming, as described by the non-profit partner organization or school leadership.

Purposive sampling schemes were used to strategically choose cases to yield a depth of information and add important perspectives to the phenomenon of interest (Collins, 2010; Miles and Huberman, 2014).

In the interview protocol, individual participants from each stakeholder group were asked to identify the level and nature of their involvement in the FTS programming. Parents and staff members from the community partner organization described their own participation. In addition, teachers and school leadership were also asked to describe parent involvement in FTS programming as well as their relationship and the type of support provided through the non-profit partner. Interviews with teachers, school leaders, parents, and non-profit staff that work closely with FTS at the school provided rich information about the contextual influences and diverse perspectives at the heart of my research questions.

According to Collins (2010) the "gold standard" for sample size for purposive samples is saturation. Due to time constraints in this study, sample size guidelines were followed while attempting to reach saturation. Following Creswell's (2012) recommendation, an ideal sample would include interviews from at least 3-5 individuals in each strata of the sample: teachers, school administrators, parents, and non-profit partner staff. A total of nine stakeholders were interviewed: three teachers, the school principal, two parents, and three non-profit staff members. All interviews were recorded for subsequent transcription and analysis. Each interview was followed by a memo to document immediate impressions, notable information, and ideas that emerged (Miles and Huberman, 2014).

Due to the difficulty recruiting interview participants, the ideal sample size was not achieved for all stakeholder groups. However, triangulating data among the other stakeholder groups bolsters the themes that arose from the variety of interviews.

Document Review. Document review focused on three types of archives: the school newsletter and other school communications; community newspaper articles referencing FTS; and programmatic reports from the non-profit partner organization. As recommended by Yin (2014), these documents were used to corroborate and augment information from the interviews. The school newsletter provided additional perspectives on how teachers and school staff viewed FTS programming and how they communicated with parents and community members. Community newspaper articles illustrated local perspectives and knowledge about FTS programming at the case study school and in some instances highlighted the role of parents and community members in FTS events. Programmatic reports form the non-profit organization clarified the role and goals of the organization in its collaboration with local schools.

Direct Observation. Direct observation of the FTS programming supported a contextual understanding of the research questions, provided immersion as a qualitative researcher, and enriched triangulation of data from the interviews and document review (Creswell, 2012; Yin, 2014). Over the course of a spring and fall semester of 2018, all key aspects of the FTS programming were observed, including farm visits, guest chef classes, and farmer visits. In particular, these visits were an opportunity to directly observe the role played by parents, community members, and the non-profit partner organization.

Data Analysis

To explore the data, general and detailed readings of the transcripts were done, using marginal notes to enhance meaning and clarity for coding (Creswell, 2012; Miles and Huberman, 2014). A process of inductive coding (examining the data, identifying meaning from units of the dialogue, and attaching codes) was used to analyze the data (Onwuegbuzie & Combs, 2010). Finally, pattern coding was used to organize individual codes into broader themes (Saldaña, 2013). As recommended by Creswell (2012), the field notes from the participant observation, document review, and interview memos were analyzed using the same process. NVivo software was used to code data and develop themes across the different data sources. To strengthen the accuracy and consistency of the coding, a process for reaching inter-coder reliability and inter-coder agreement was followed (Campbell et al., 2013).

Findings

Findings from the research revealed several themes related to community-school partnerships in the context of a comprehensive FTS program: (a) an extensive role played by the community partner in the FTS programming; (b) unique opportunities for family engagement through FTS programming; and (c) a culture of school wellness supported the community partner relationship.

Extensive role of non-profit partner in FTS programming

As described in the WSCC model, "the school, its students, and their families benefit when…the district or school coordinates information, resources, and services available from community-based organizations" (Lewallen et al., 2015, p. 733). A

notable aspect of this case study research of a comprehensive FTS program was the extensive role played by the non-profit community partner. Involvement by the community partner included four broad areas of activities: (a) programming and funding; (b) planning, evaluation, and marketing; (c) relationship building and advocacy; and (d) promotion of local agriculture.

Programming and Funding. At the ground level, FarmWorks staff is responsible for planning and delivering all FTS programming at Oakvale Elementary. The organization is responsible for developing the types of FTS programming offered, with only minimal input from school administration. This includes piloting new programs and broader FTS networking to share knowledge and best practices.

At Oakvale Elementary, an essential part of this programming is an off-site educational farm, which is funded and managed by FarmWorks staff. This farm is the site of farm field trips, a U-Pick program for school students and parents, plant starts for the annual school plant sale fundraiser, produce for the school garden cart, and produce for the tasting week. The educational farm offers guided farm visits for all students in the fall and the spring, a two-week summer camp for local students, and an opportunity for students to "taste" what it's like to be a county farmer. Farmers from this farm also visit the schools for the farmer visits, in which they do hands-on activities to engage students in agricultural learning. One parent described the range of opportunities that students experience in relation to the educational farm:

> They visit [the educational farm] in the fall and the spring. And so they'll help pick the produce that goes on the garden cart, so it's nice to see that connection. And in the spring they help plant, and in the fall they're harvesting for the garden cart. And so that's another component, is the farm field trips. We also have

> farmers from [the educational farm] come to the school and do lessons with the kids. So it was farmer Maggie when she was still here, and now we have Emily.

According to one Oakvale Elementary teacher whose second grade students have visited the educational farm for a number of years,

> The farmers out there are super great with the kids. The lessons are engaging and even though there's, at times kids who aren't doing the right thing, you never see any of them get frustrated. They know they're kids, and they'll just help redirect them if no other adult has noticed. It's just very positive.

Parents, teachers, and non-profit staff members all spoke to the unique learning opportunities that were available to students through the strong partnership with FarmWorks. The FTS program, and the strong community partnership that supports it, allows students to learn actively about food, farm, and nutrition-related learning activities. Participants referred to the unique nature of learning that students experienced through the FTS programming. The "hands-on" learning experiences of FTS, including digging in the earth, growing a seed, and cooking, are about "getting outside and getting active with your hands." These experiences were contrasted with learning that's "just about sitting in a classroom and getting a lecture." The co-director at FarmWorks described the FTS approach to education in the following way: "The more we can get kids outside, learning, the better experience they're going to, and the more they're going to absorb."

Teachers also valued the "continuity of learning" that students experience in the FTS program as they "see the full cycle of planting, growing, harvesting, and eating," and as they "learn about the food cycle and where food comes from." They "try new vegetables they typically might not have access to," and they even "get excited" about

preparing and eating local vegetables. When students participate in the guest chef program, one parent explained,

> A local chef or enthusiast will come in a do a hands-on interactive lesson, and then use the same farm partner. So you're using local, in-season food, doing a hands-on lesson, then the kids get to eat what they make. So that's really fun.

Funding is another foundational part of the programming that FarmWorks supports. While partner schools are asked to pay $2/student annually for FTS programming, this only covers a small proportion of program costs. FarmWorks engages in extensive fundraising annually to fund FTS programming in the county, including a large grant from the California Department of Food and Agriculture.

Evaluation and Marketing. At the next level of support, FarmWorks engages in program evaluation and marketing for FTS programming at Oakvale Elementary and other schools. FarmWorks conducts on-going data collection for program evaluation and improvement, including annual student and parent surveys. According to the FarmWorks FTS Director, the organization is currently in a process of updating their evaluation efforts:

> In the past we've been really regular about asking kids through taste tests to raise their hand, have you tried this vegetable before, this fruit before? I think that type of evaluation will continue for sure. I'm also really interested in getting more into the quantitative side of it, though. Meaning looking at how food is impacting whether kids are showing up at school. Are they coming because they know they can get a good meal? Because I've heard in other case studies there's a definite connection there. And then again, the academic performance, and can that be linked to the FTS program.

For certain initiatives, the organization also creates marketing and informational materials. For example, when the new FTS lunch program was launched at Oakvale

Elementary, FarmWorks staff created a logo, informational materials, and a menu template to inform families of the new initiative.

Relationship Building and Advocacy. FarmWorks staff invests significant time in creating and sustaining relationships at the school, district, community, and state levels that are foundational to FTS programming. Stakeholders include local farmers, newspapers, parent groups, school principals, district superintendents, and food service providers. As described by the Co-Director at FarmWorks, these relationships have been essential to develop and sustain FTS programming at Oakvale Elementary:

> I think certain administrators have been more supportive than others, and certain superintendents have been more supportive than others…I knew the school community intimately. And I knew who the champions were. And I knew who I needed to get on board. So there's a lot of political navigation that [FarmWorks] has been able to perform as well. In that school and other schools, if we felt like there were going to be nay-sayers, we could work with them ahead of time, and I could pinpoint who they were going to be. So that's an interesting twist.

FarmWorks staff also engage in advocacy for FTS by participating in and hosting regional and state-level networking and educational gatherings to strengthen FTS and local food systems. The Procurement Specialist described how FarmWorks supports the local food service directors through state-level networking:

> We participate in this network of food service directors who are really focusing on scratch-cooked meals and local procurement. And that's a piece that the food service director doesn't believe that she has the time to do, is really participate in bigger networks. So knowledge sharing and best practices, and so we've been able to act as a local representative to be going to conferences and to be sharing the work that she's doing.

In addition, FarmWorks and the FTS programming at Oakvale Elementary is an avenue for other local and state-level entities to engage with the school. The University of California Cooperative Extension has donated in-kind services and financial assistance for

school gardens and taste tests. The local public health department provides guidance on shaping policy through FarmWorks FTS programming. In addition, the FTS program has been used by CalFresh to publicize its programming and to promote purchasing of local produce with CalFresh dollars.

Promotion of Local Agriculture. Finally, FarmWorks supports a fundamental component of FTS: local agriculture. The organization provides extensive training opportunities for new farmers, including on-going courses and an annual agriculture conference. The FarmWorks Procurement Specialist works directly with food service staff to develop and sustain farm-direct purchasing that supports local farmers. She describes the extensive range of her work in the following way:

> Part of my job description is to find procurement opportunities for mostly institutional buyers…so that includes contacting local farms and farmers or distributors and finding out what they have available. And then offering those opportunities to our partners and encouraging our partners to purchase from local farmers. But I end up doing a lot more than that. A lot of it is creating educational materials to encourage local purchasing. Not just finding the procurement opportunities but creating the demand for them. Running tastings at the schools so that the kids are asking for these local items, whether it be local apples or doing a tasting of slaw that features local cabbage and local carrots so that the kids are asking for the slaw so that the food service director at the high school is purchasing the slaw. So it's education, it's marketing and procurement.

Throughout their initiatives at Oakvale Elementary, FarmWorks fulfils a range of roles that are essential to the FTS programming.

Opportunities for Family Engagement

This study also revealed unique opportunities for family engagement through the FTS programming at Oakvale Elementary. Parents are involved in the FTS programming both directly and indirectly. First, parents offer on-the-ground support to FTS

programming when they act as chaperones or assistants during planned FTS activities. Parents provide hands-on support during the farm field trips and guest chef week. According to one parent, "a lot of parents will be at the farm field trip as a chaperone, so I think that's a good exposure." Another parent described her own participation:

> For the field trips I used to try to go out to the farm and help lead some of the rotations. It was fun. And then I also volunteered as the guest chef. So I've done that, I did that three years in a row.

A teacher described the positive feedback from parents around their participation as field trip volunteers:

> Usually we have quite a few parents participating. It's an easy field trip for them to go on, and I like to have lots of parents on that trip, because we put the kids into four groups, and it's nice to have a parent with each group. And those are the parents I hear from, and they love it. And they have very positive things to say about it.

Parents may also engage with the school by acting as the FTS liaison, a position coordinated and funded by FarmWorks. The liaison receives a small annual stipend from FarmWorks, and parents are encouraged to apply. Each year, FarmWorks places the following announcement in the school newsletter about the position:

> [FarmWorks] is looking for a new [Oakvale] Farm to School liaison! The Farm to School liaison is the point person for coordinating [FarmWorks] Farm to School activities. The person works closely with the [FarmWorks] Farm to School staff, school administrators, teachers, farmers, students, and families to strengthen the connection between farm-fresh food and the community's health and wellness. Responsibilities include coordinating Harvest of the Month tastings, coordinating farm field trips and farmer visits, coordinating Tasting Week, and running the garden cart. (School Newsletter, March 15, 2018)

The liaison is responsible for a range of on-the-ground tasks at the school including delivering produce from the farm to the school for the Harvest of the Month program; stacking and manning the weekly garden cart in the fall; running the plant sale in the

spring; and coordinating guest chef visits during Tasting Week. In discussing her role as the current FTS liaison, one school parent enthusiastically described her participation with the fall garden cart:

> It's donation based. There's a handful of parents, but usually it's kids. It's always in the newsletter, that it's going to happen, and it's right by the drop-off line, so it's very visible. Kids learn that they can bring some donation money and donate for fresh produce. And they're like, "I wanna bring this home to my brother!" Or, "My mom loves eggplant!" So just seeing them excited is one of the biggest benefits. Because how often do you see kids getting excited about getting vegetables?

As a less direct form of support, the Parent Teacher Club is responsible for funding the FarmWorks programming fees for the FTS programming at the school. In the 2017/2018 academic year, the PTC raised $5,000 dollars to fund the FTS programming. Oakvale Elementary is unique in that the PTC has provided more funding for the FTS programming than any other school in the FarmWorks network. This allows all students to participate in the program each year, not just specific grades. The FarmWorks Co-Director highlighted this point:

> At [Oakvale], the PTC has always, they're the one school that, when we bring in farmers, when farmers come into the classrooms for visits, or when kids go out on the field trips, it's almost the whole school that participates. Versus, "we fund four classes for farmer visits," or "we'll fund four guest chefs to come in." The [Oakvale] PTC wants more than that. So they fundraise for it.

One of the school parents who was interviewed was also the president of the PTC, and she explained recent funding decisions regarding FTS:

> We just voted on our budget last night for PTC. So we were going to cut it in half, for FarmWorks, but that was really hard to do. Because we feel like it is such a benefit for the school, and that is something that's a big item at our school that we like to promote as something that we support.

Parents also described their role in planning and decision-making around the FTS programming at Oakvale Elementary. One recent FTS initiative, the development of a new scratch-cooked meal program, provided a number of opportunities for parent involvement at multiple levels. Through her own personal interest in healthy school food for her children, one of the parents became involved in developing the new meal program for the school in collaboration with leadership at FarmWorks. She related the story of her initial involvement:

> And it turned into wanting to start with a salad bar at the school, just so we could have some fresh vegetables. I really had a hard time seeing things sealed in plastic. So we did some observations and found out what everyone in this area was doing. Being in PTC at that time, I was hoping that there was something funding-wise that could help. And so I got [Oakvale], with [FarmWorks'] help, to get involved and to look at what it would cost and look at what it would be support-wise for people to run a new program, the staff. And we went and presented at the Board, and we brought samples of the school food, so they could see how it could be improved.

As the new lunch program was developed, another parent described her role as a volunteer:

> Well, one thing that [FarmWorks] did was come in and give the kids samples of menu items that would be served. So that was really helpful. And I helped volunteer for that a few times. So we came around and gave all the kids quesadillas, and one time they did hamburgers, and then they did pizza. So that might have peaked their interest a little bit.

A wider set of parents was also involved in the process by sharing their opinions about the program when FarmWorks held a series of meetings to discuss the program. One of the parents described these meetings:

> So just seeing the progression from what we would start with, and we would see years down the line, and what we would want to change. It was really helpful to go to those meetings and see what the parents wanted. And get a range of parents, those who are on FRL if we could, and those whose kids who predominantly ate

> packed lunches. And so just finding out more information from people, teachers and the students and the parents, what they were looking for. So that helped break that down; it was a slower process, but it was a huge process in helping everyone feel more comfortable with it.

In addition to hands-on support, fundraising, and program decision-making, additional ways that parents support the FTS programming is by attending the U-Pick days at the educational farm, growing seedlings for the annual plant sale to raise funds for the FTS program, and donating excess produce from family gardens to the garden cart. The Co-Director at FarmWorks discussed her perspective on family involvement as it related to the U-Pick program:

> Our U-Pick out at the educational farm is proof that when you connect kids to who's growing their food and what fresh food tastes like, they want to get their families involved in the experience. So we're seeing an increase, an uptick in the number of families that are shopping weekly at the farm, they're picking their own vegetables together.

Both through the liaison position as well as regular FTS programming, FTS at Oakvale Elementary offers unique opportunities for families to become involved in the school. However, research from this limited study may suggest that certain parents are more likely to participate in these opportunities than others. Both parents who reported high levels of participation in this study were educated professionals with personal interest in health and nutrition. Although this research did not specifically investigate parent involvement as related to socio-economic background or education level, the FarmWorks Co-Director did suggest that levels of parent involvement were not equal across schools and diverse families:

> So I think with certain parents if they are coming to school and they're volunteering or even if they're not, if they're reading our newsletters, they're still able to participate. But like I mentioned before, I would love to see how we can

> do a deeper dive in the coming years, especially in the low-income schools. And how we can do a better job reaching those parents. So that they can feel like they themselves are part of the change in their child.

School Culture of Health and Wellness Supports Community Partnership

In the case of Oakvale Elementary, a school culture focused on health and wellness has supported the extent of FTS programming and the relationship with the non-profit partner. Stakeholders frequently referred to the Oakvale Elementary culture of wellness. As one parent explained, "The history there, it's really a culture that really values health."

Interviews with non-profit staff confirmed that this school culture has supported the community partner's involvement. The non-profit Co-Director described Oakvale Elementary as an "early adopter school" for FTS. She explained,

> For years now they've always had a parent community and an administrative staff that was interested in health, student health and wellness. And it feels like for nine years now that school has made it a priority, student wellness is just a priority. And so whenever we brought ideas to the staff or to the parent community, they're usually lovingly embraced.

She related that during her tenure at FarmWorks, it was always "easy" to work with Oakvale Elementary because health programming was "ingrained" in the culture. "They're always so willing and open to try new things when it comes to student wellness." Similarly, the Food Procurement Specialist at FarmWorks shared that she had "really great interactions with" the Oakvale Elementary leadership as "huge supporters of the program."

School resources allocated for programming also reflect the school culture focused on wellness and increase the level of student participation in FTS activities.

Oakvale Elementary is the only school in the FarmWorks umbrella that provides funding for all students to participate in FTS activities. In describing the PTC's decision to provide more funding for FTS programming than any other local school, the PTC president explained: "We feel like it is such a benefit for the school, and that it's something that's a big item at our school that we like to promote as something that we support." In her view, the school culture of wellness was an aspect of the school that attracted families and was a source of pride for the school community.

Discussion

Existing research confirms that community involvement and family engagement are foundational to healthy schools. This research illustrates that FTS programming may provide community partners and families meaningful opportunities to collaborate with students and the school community. In the example of this case study site, a school culture that values health and wellness has fortified and strengthened the community-school relationship.

Findings from this study highlighted an extensive role played by the non-profit partner in FTS programming, including activities in programming and funding; planning, evaluation, and marketing; relationship building and advocacy; and promotion of local agriculture. In the context of FTS programs, existing literature points to the essential role of community partnerships in building and sustaining programming. "Farm to school programs," state the authors of *The Evolution of the School Food and Farm to School Movement in the United States*, "do not just happen. They are born of months and years of building community partnerships and trust" (Feenstra & Ohmart, 2012, p. 286). In a

recent study of school culture and FTS, the authors found that strong relationships with community partners were vital to embed and sustain FTS programming, according to participating principals (Cirillo & Morra, 2018). This article extends the existing literature on FTS and community-school partnerships by examining the specific roles and nature of the community partner relationship in a case study school.

Although the partnership between FarmWorks and Oakvale Elementary does not fit within Sanders' (2003) typology of business partnerships, university partnerships, service-learning partnerships, and school-linked service integration, the findings do illustrate several areas of overlap. Specifically, the collaboration provides a number of assets to the student body and school community that are outlined in Sanders' (2003) typology. Through the collaboration with FarmWorks, Oakvale elementary students experience school improvements (a school orchard and improved school food), funding for programming, enhanced learning opportunities, program evaluation, and field experiences that provide opportunities to contribute to social and environmental initiatives. As students have opportunities to engage with community members, care for school orchards and local farms, and harvest food for the school produce cart, they may be meeting the goals that Sanders (2003) articulated for service-learning partnerships: building stronger communities, fostering engaged citizenship, and making traditional classroom learning more vibrant.

Findings from this study also support existing research that comprehensive FTS programming may increase community engagement in school food and local food systems, including support from parents and community for healthier school meals

("New USDA Data Show Growing Farm to School Efforts Help to Reduce Plate Waste, Increase Student Participation in Healthier School Meals Program," 2015; "The Farm to School Census," 2015). In this case, the initiative for a healthier school lunch program connected to the FTS programming provided opportunities for parent involvement in the process of program planning and development.

Parents and other stakeholders in this study described several areas of family engagement that were available through the FTS programming at Oakvale Elementary. Although there is a lack of research around family engagement and FTS programming, one synthesis of research from preschool settings does support the finding that comprehensive FTS programming may be connected to increased parent engagement (Hoffman et al., 2017). While this study did not measure levels of parent engagement, it describes the types of parent engagement activities that were available through the FTS programming at the case study school. Parents were involved in volunteering activities when they acted as chaperones for farm field trips and guest chefs during Tasting Week at school. Parents were also involved in decision making activities through FTS in their roles as FTS liaison, PTC members, and by providing input for the new school food initiative. Finally, the FTS programming provided parents with opportunities to collaborate with community members and to increase connections between the school and community partner, such as acting as FTS liaison, volunteering, and attending U-Pick days at the educational farm. Existing research, as discussed previously, suggests that these types of parent engagement activities in school have been linked to improved

student health and achievement. Furthermore, these types of opportunities correspond to strategies recommended by the CDC to increase parent engagement in schools, including

- provide a wide range of volunteer opportunities;
- enlist parents to coordinate volunteer activities;
- encourage parents to be part of decision making at school, specifically by involving parents in the selection of school food choices; and
- collaborate with community by linking family members to school and community programs that promote health (Centers for Disease Control and Prevention (CDC), 2012).

Finally, findings from this study describe how a school culture of health and wellness have supported a strong community-school partnership at Oakvale Elementary. This finding aligns with the WSCC model, in which each segment and layer is interdependent on the others (Lewallen et al., 2015). Furthermore, it supports the observation made by WSCC researchers that school leadership support, particularly principal support, has been a "key factor in the success of the integration of learning and health in schools" (Lewallen et al., 2015, p. 734).

Limitations of Study Design

A fundamental limitation of the case study design is lack of generalizability (Creswell, 2012; Yin, 2014). This may be especially relevant for single instrumental case study designs. In this study, another limitation is the small sample size, particularly the number of parents that were interviewed. Time and scheduling constraints on the part of school parents was a barrier to including more parent interviews; this may have excluded

parents with more demanding work or family schedules. The parents interviewed did not represent diverse economic and educational backgrounds. In addition, only parents with a high level of FTS involvement were included, which could also potentially bias the sample. However, triangulating data among the other stakeholder groups bolsters the themes that arose from the variety of interviews. An additional analytic limitation is that the unit of analysis for this study—a school with a comprehensive FTS program—does not correspond to the units of analysis in the majority of existing research, making it more difficult to compare and contrast results (Yin, 2014).

Implications

The WSCC framework, supported by research in the fields of education and public health, illustrates that parents, schools, and communities all need to work together to create an environment that facilitates the healthy development of children and adolescents. This research suggests that FTS programming may provide avenues for parent engagement and community partner involvement in schools, which are important contributors to student academic achievement and psychosocial well-being. Further research is needed to investigate the potential of FTS programming to contribute to parent engagement and broader community involvement, particularly in the context of diverse student and family populations.

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Appendix: Whole School, Whole Child, Whole Community Model

The following image is a visual representation of the Whole School, Whole Child, Whole Community Model. It was copied from the Centers for Disease Control and Prevention website ("How the WSCC Model Informs HIV, STD, and Pregnancy Prevention | Adolescent and School Health | CDC," 2018).