FARM TO SCHOOL AS AN EDUCATIONAL TOOL FOR SOCIALLY SUSTAINABLE FOOD SYSTEMS: A MIXED-METHODS STUDY OF HICKORY MIDDLE SCHOOL AND ITS LARGER IMPLICATIONS

by

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(Under the Direction of JENNIFER JO THOMPSON)

ABSTRACT

Farm to school (FTS) is a popular educational movement in the U.S. that engages students in experiential learning activities such as taste tests of local produce, food and garden-based education, and related activities connected to K-12 curriculum. FTS has been shown to have positive program outcomes such as modestly improving childhood nutrition (Berezowitz et al. 2015) and fostering environmental stewardship (Blair 2009). FTS has also been critiqued as ultimately not addressing the underlying causes of food insecurity (Allen and Guthman 2006). This thesis aims to strike middle ground between the celebration and social critique of FTS through ethnographic research that examines an FTS program at Hickory Middle School. This research characterizes how FTS 1) contributes to a collaborative learning environment and collective responsibility; 2) affects how students think about "healthy eating"; and 3) influences how students think about the three pillars of sustainability.

INDEX WORDS: Farm to School, Sustainable Food Systems, Environmental Education, Childhood Nutrition

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DEDICATION

For Rhys.

"I would say that there exists a thousand unbreakable links between each of us and everything else and that our dignity and chances are one. The farthest star and the mud at our feet are family; and there is no decency or sense in honoring one thing or a few things and then closing the list. The pine tree, the leopard, the Platte River, and ourselves- we are at risk together or we are on our way to a sustainable world together. We are each other's destiny."

-Mary Oliver, *Upstream*

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TABLE OF CONTENTS

Page

APPENDICES

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

Introduction and Literature Review

Rationale

Farm to school (FTS) is a popular approach for food systems education in K-12 schools across the United States. FTS spans both the classroom and the cafeteria with three main goals: increasing procurement of locally grown fruits and vegetables in school cafeterias, planting and maintaining school gardens, and implementing educational activities that link food to school curriculum (USDA 2015; Joshi et al. 2014). Through these avenues, FTS is promoted as a way to improve student health and food knowledge (i.e. the popular idea of "learning where your food comes from"), while also forging economic partnerships between schools and their local farms. To quote the National Farm to School Network, "Farm to school enriches the connection communities have with fresh, healthy food and local food producers by changing the food purchasing and education practices at schools" (farmtoschool.org). Through this broad-based definition, schools adopt a variety of approaches to the build programs that best fit their school goals and environment.

The United States Department of Agriculture conducted a census of FTS activity across all US school districts in 2015. In their findings, they report that 42% of schools that completed the survey participate in some form of FTS programming, reaching approximately 23.6 million students. There are several forces driving this educational wave in the US. One primary reason that schools adopt FTS programs is in the interest of improving childhood nutrition. Optimal fruit and vegetable consumption is linked with improved health and lowered risk for diet-related

diseases such as cardiovascular disease, obesity, certain types of cancer, and other chronic conditions (Robinson-O'Brien, Story, and Heim 2009). Schools also adopt FTS programs in the interest of increasing student learning about the environment and life sciences (Ratcliffe, Merrigan, Rogers, and Goldberg 2011). School gardens can provide a unique, experiential avenue for teaching about ecological function and agricultural practices (Joshi, Azuma, and Feenstra 2008). Our research looks deeply into one school garden-based FTS program at in the Southeast US and how it teaches students about health, nutrition, and "sustainability".

Literature Review

FTS has been a subject of growing scholarly interest, since its rise in popularity as an educational approach. Because FTS programs are interdisciplinary, there are several areas of focus that research explores. For the purposes of this thesis, we will discuss the relevant nutrition and environmental education based research that speaks to this thesis. Then, we will also introduce a social critique of FTS that is relevant to our research.

Childhood Nutrition

A significant portion of FTS research explores how these programs impact childhood nutrition. Improving student nutrition is one of the most cited reasons that schools engage in FTS programming. This body of literature takes mainly a quantitative approach, and seeks to measure a change in students' attitude towards and consumption of fresh fruits and vegetables. Overall, these findings indicate that FTS participants consume slightly more fruits and vegetables in their school meals (Yoder et al. 2014; Robinson-O'Brien 2009; Joshi, Azuma, and Feenstra 2008), have improved attitudes towards and recognition of fruits and vegetables (Ratcliffe et al. 2011;

Robinson-O'Brien et al. 2009; Joshi et al. 2008), and have improved nutrition knowledge (Parmer, Salisbury-Glennon, Shannon, and Struempler 2009). One mixed-method study demonstrates an increased willingness to try new foods (Gibbs et al. 2013).

A review article of school garden research corroborates these findings, although they also report that they qualify of the majority of this quantitative work as "weak" because of lack of statistical significance, a reliance on student self-reporting, and non-randomized studies (Ohly et al. 2016). This same review article also points to a small body of qualitative research that has been conducted on garden-based learning. The qualitative literature supports the quantitative findings, and also demonstrates that students report a sense of connection to food through growing a garden, which in part increases their enthusiasm for trying fruits and vegetables (Ohly et al. 2016).

USDA supports student nutrition through Child Nutrition Programs, which include the National School Lunch Program (NSLP), School Breakfast Program (SBP), dinner, and Summer Food Service Program. The most prevalent way that schools implement FTS is through including local foods in these USDA-supported child nutrition programs (USDA FTS Census 2015). This cafeteria component of FTS is promoted as expanding *all students'* exposure and access to fresh, healthy fruits and vegetables regardless of income. This may be especially important for students who are food insecure and most vulnerable to diet-related diseases (Ratcliffe et al. 2011; Yoder et al. 2014; Berezowitz et al. 2015; Ozer 2007; Joshi et al. 2008).

Environmental Education

The school garden movement, one of the main components of FTS, is also based in the pedagogies of experiential and environmental education (Desmond, Grieshop, and Subramaniam 2002). Through hands-on education in the garden, students participate in lessons that are a part of their regular school day, but take place outdoors. This is seen by advocates and researchers as having many benefits. Primarily, those involved in garden-based learning argue that with the plethora of environmental issues our planet faces, we need to grow a generation of students who have a connection with nature and therefore want to protect it (Blair 2009; Aguilar, Waliczek, and Zajicek 2008; McBeth and Volk 2010; Fisher-Maltese 2016; Harvey 1990). Since the majority of our population lives in urban or developed environments and school takes place almost entirely indoors, children have limited interaction with natural ecosystems (Aguilar et al. 2008). School gardens are therefore seen as a one way to facilitate relationships with nature, a sense of environmental stewardship (Aguilar et al. 2008) and familiarity with the natural world that "puts science in context" (Blair 2009, p. 18).

A small number of studies have investigated the extent to which school garden programs promote nature connection and environmental stewardship among students. Gardens, in general, have been found to promote "close, personal experiences with the earth" which in turn creates a sense of confidence in nature that is considered to be a healthy part of human development (Thorp and Townsend 2001, p. 349 in Blair 2009). A 1998 study compares the environmental attitudes of a control group of students to a group that participated in a comprehensive school garden program called Project GREEN (Skelly and Zajicek 1998). The students participating in the school garden program demonstrate a significant increase in environmental attitudes, as

measured by the Children's Environmental Response Inventory (CERI) developed by Bunting and Cousins (1983). Fisher-Maltese (2016) reports that students who participate in an insect-based school garden program demonstrate improved attitudes towards nature, "thus preparing to become environmental stewards" (p. 67). Additionally, students who attend schools with highly vegetated grounds display increased plant knowledge and enjoyment of nature, and decreased ideas of human dominance over nature (Harvey 1990). An additional study demonstrates no statistical difference in environmental attitudes between a student control group and a group participating in a school garden program (Aguilar et al. 2008). However, they discovered that students with prior garden experience outside of the school garden program displayed statistically significant positive environmental attitudes when compared to students with no prior gardening experience. Taken as a whole, these studies demonstrate promise in terms of school gardens fostering environmental stewardship and nature connection among students.

Social Critique of FTS

At the same time that FTS work has been found to have modest positive nutrition and environmental impacts, a dedicated group of critical scholars charge that FTS ends up promoting (instead of working against) neoliberal values. Neoliberal economic philosophy has had a complex and ubiquitous force on western society since the 1970s. As a philosophy, neoliberalism places the onus for well-being on individuals and private organizations rather than collective action or state-level policy-based solutions (Davies and Pansel 2007). Neoliberal economic policy affects food systems and health by creating a powerful corporate food regime and a host of associated social issues. Commodity foods are more cheaply priced and readily available than their healthier alternatives (Minkoff-Zern 2012); farm workers are severely underpaid,

overworked, and many times food insecure (Quandt et al 2004); and changing economic markets make it hard for family farms to survive (Suess-Reyes and Fuetsch 2016). In the US and around the world, low-income and communities of color are disproportionately affected by these food-related issues, creating problems such as diet-related diseases, food insecurity, and loss of farming livelihood (Otero et al. 2013).

The social critique of FTS argues that these programs promote neoliberalism through their reliance on privatized funding and volunteer labor, creating a situation where more affluent schools can better support FTS programs (Allen and Guthman 2006), a finding also corroborated by the USDA (Ralston et al. 2017). Secondly, by focusing on outcomes such as improving standardized test scores, obtaining normative body sizes, and educating about 'healthy choices,' critics argue that FTS programs rely on the rhetoric of personal responsibility rather than educating students about the structural causes of food insecurity and organizing for collective solutions. Critics further warn that "'sustainable' gardening" programs are a "depoliticized" form of education that distracts from addressing the real harms of neoliberalism because they do not address the inherently political factors that affect food systems, such as economic inequality (Meek and Tarlau 2016, p. 239). Meek and Tarlau (2016) call for food systems education that explicitly makes use of critical pedagogy. They argue that food justice, food sovereignty, and agroecology are the only ways to disrupt the social and ecological harm caused by the neoliberal narrative.

Direction of this Thesis

The research that makes up this thesis seeks to characterize the outcomes of an integrated, garden-based FTS program. Furthermore, this research adds an element to FTS research that has largely been absent: the voices of students and teachers themselves. Our approach is sensitive to the social critique of FTS, but also is grounded in rich, ethnographic data. Specifically, we am interested in understanding to the extent to which the social critiques hold true in this particular case. Is FTS further reinforcing personal responsibility around health? What are the messages and ways of thinking students take away by participating in these programs? How do these programs socially organize the school body? Through answering these questions, we seek to examine the lived-reality of FTS programming and how this maps onto the critiques leveled.

Research Questions

Our research has several driving questions. We broadly aim to understand what to students *really get out of* FTS programs. We are interested in how these programs influence student in the areas of their attitudes toward and perceptions of food insecurity, and their understanding of "sustainability." Our research also looks at the ways FTS programs change the educational and social landscape of a school. Our more specific research questions are:

1. What are the ways that the school body socially organizes around FTS programming?
2. How do students think about *healthy eating* in the context of FTS?
3. How do students think about *sustainability* in the context of FTS?

Research Site Description

The research site, Hickory Middle School (HMS)[1], is an economically and racially diverse public middle school located in Rivertown, a town of approximately 110,000 located in the Southeast US. HMS is a majority minority public middle school that serves several low-income neighborhoods, which are overwhelmingly African American, as well as wealthier neighborhoods, which are overwhelmingly white (see Table 1.1 below for demographic data). The free and reduced lunch rate at HMS during the 2015-2016 school year was 63.6%. However, beginning in 2016 through USDA's Community Eligibility Provision for high poverty districts, the district now provides free breakfast and lunch to all students who attend Rivertown schools, including HMS. Rivertown has been a part of the growing FTS movement for most of the last decade. The majority of its public schools have on-site vegetable gardens and serve local produce in their cafeterias. One of the most established and well-integrated programs in the district exists at HMS.

A Virtual Tour of HMS's FTS program:

Over the past five years, the FTS program at HMS has shaped the entire landscape of the school. First of all, the 7000 ft^2 vegetable garden and fruit orchard takes up the majority of the front lawn, surrounded by a tall deer fence. If you walk around the fence and into the courtyard, you see a fully-automated greenhouse framed by several cinder-block style raised beds sprouting strawberries and greens, and felt pocket hangers growing a variety of herbs. Agricultural Science (AS) students mill around in knee-high rubber boots, feeding four female goats and dozen or so

[1] The names of the school, town, teachers, and students have all been changed to protect confidentiality. Students chose their own pseudonyms, while the school, town, and teachers were all assigned pseudonyms.

chickens that make their home in the courtyard. The animal enclosure is complete with student-constructed goat play structures made out of recycled materials. Family and Consumer Science (FCS) students walk out of their classroom door into the courtyard, past a half-finished adobe pizza oven to clip herbs for their cooking lab. Outside of the courtyard and to the right is "sustainability lane," lined by a tool shed, a tinkering pile of scrap wood and metal, and a pen for Boots, the male goat. Further down are three massive wooden composting bays full of food scraps and wood chips in different stages of decomposition. Heading into the cafeteria, students peruse the garden bar, eating lettuce and carrots grown in the garden on recently purchased reusable lunch trays and silverware, which replaced Styrofoam trays and plastic forks. At the end of the lunch period, students sort their waste into three different bins, compost, recycling, and landfill, each labeled with colorful signs. Out in front of the school on Mondays, students help sell produce from the local university's student-run garden to parents and teachers, which is offered half-price to SNAP recipients.

A core group of HMS teachers and staff who call themselves the "sustainability squad" (henceforward called the "squad") have shaped the FTS landscape and programming. The squad includes the FCS teacher Eliza, AS teacher Michelle, school principal Tom, Low Incidence Disability Teacher, Justine, a recently added district-level Middle School Garden Coordinator Virgil, and a yearly rotating AmeriCorps VISTA. When asked about how the program began, Principal Tom remarks on the synergy of the current group and their shared vision of using the garden to incorporate an over-arching mission of environmental stewardship throughout the school. In talking about the origins of the FTS program, he states,

> And then I had Michelle and Eliza and it was just these really powerful people that were very aware and had their own kind of mission about this. So, you add Virgil to that mix, and it's a little bit of 'get me out of the way!' I've realized recently it's a lot more that I need to move out of the way and let them [lead].

In addition to the organic nature of the sustainability squad coming together, the FTS programs are supported through strong community and institutional support. The local university supports the program through its Public Service and Outreach division, hosting an AmeriCorps VISTA who manages many aspects of FTS at HMS. Recently, due to the success of the program at HMS, a Middle School Garden Coordinator position was created through a three-way financial partnership between the local university, Cooperative Extension, and Rivertown School District. This position now oversees FTS programs and an AmeriCorps VISTA at each of the four public middle schools in Rivertown.

Research Design and Methods

We designed our research goals and questions in collaboration with the squad, using some principles from participatory research (Cornwall and Jewkes 1995). We received approval from the school district and UGA IRB to conduct this research. During the 2015-2016 school year and summer, we conducted our research using mixed quantitative and qualitative methods, specifically participant observation of FTS activities, a 6th grade student baseline survey, focus groups with 6th grade students, as well as interviews with 6th graders, administrators, teachers, and staff (see Figure 1.2).

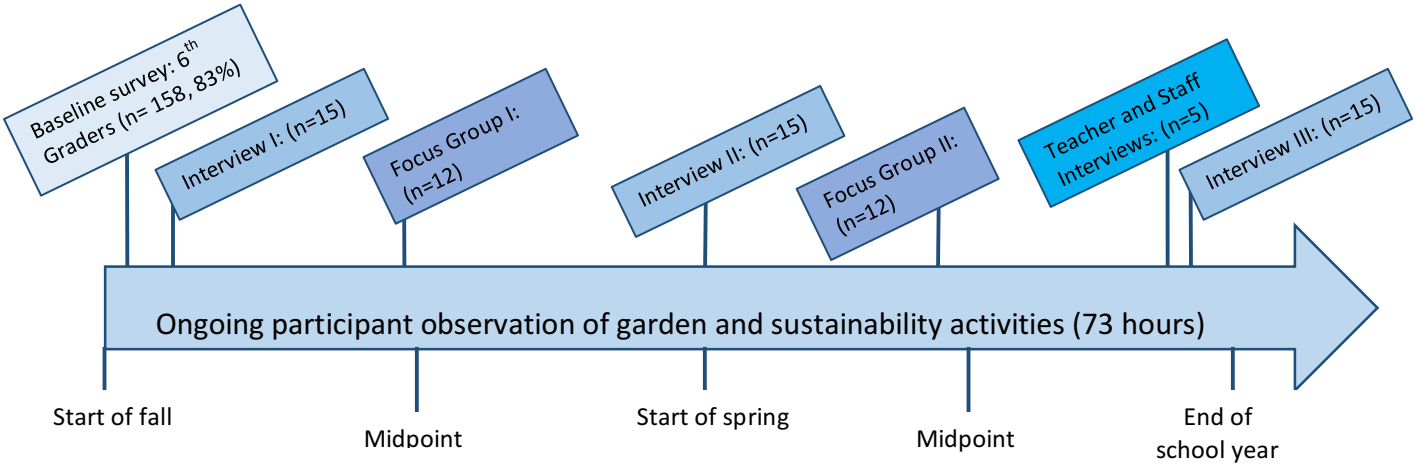


Figure 1.1: Research timeline for school year 2015-2016

Table 1.1: Sample demographics

Race/Ethnicity*	Overall School (N=665)	Survey (N=158)	Interview (N=15)	Focus group (N=12)
African American	313 (47%)	61 (39%)	7 (46%)	6 (50%)
Asian	13 (2%)	10 (6%)	0	2 (17%)
Latino/a	80 (12%)	16 (10%)	0	2 (17%)
Multi-Racial	33 (5%)	7 (5%)	2 (13%)	3 (25%)
White	226 (34%)	78 (49%)	10 (66%)	4 (33%)

* students could choose more than one ethnicity

Student Survey

Approximately 83% (158) of the 6th grade class completed the survey through their AS and FCS classes. The survey was administered through UGA's Qualtrics platform and it collected students' basic demographic information (see Table 1.1), and baseline data on students' previous

gardening experience, science content knowledge, sustainable behaviors, attitudes toward citizenship, and knowledge of the food system.

Sample Description

Based on our baseline survey data, our sample population closely resembles the overall student demographics at HMS (Table 1.1). Our sample population also comes from a diverse range of food experiences and environments. As mentioned previously, Rivertown is home to both affluent and low socioeconomic (SES) populations. Subsequently, students at HMS experience varying levels of food insecurity (see Figure 1.1).

According to our survey data, students also had a various levels of experience with home and school gardening prior to coming to HMS. 48% of the students we surveyed reported having a school garden in 5th grade. In addition, 60% of students report that their parents or grandparents have a garden at home. We additionally used the survey to assess environmental behaviors (such as recycling) and civic mindset (such as how students think about community), which are are reported in Appendix E. While these data partially informed how we selected participants for our interview and focus groups (i.e., we purposefully invited students representing a range of environmental behaviors and civic attitudes), student responses to these questions were exceedingly high overall, suggesting that students may have been overly-generous in their self-report of environmental behavior and civic mindset. Therefore, we largely excluded these data from our analysis.

Student Interviews

We invited twenty-five 6th grade students to participate in semi-structured interviews based on survey results. We selected students with a diversity of previous gardening experience, environmental attitudes, race/ethnicity, and elementary school attended. Fifteen students (60%) consented to participate in the interviews (see Table 1.1 for demographics). These interviews were conducted by JJT, JHJ, and AB. Each researcher interviewed the same set of students three times throughout the year in order to build rapport. One student left during the course of the school year, so she only completed the first two interviews.

The objective of our interviews was to characterize students' thinking around healthy eating. We adjusted our interview protocols (see Appendices A and B) in order to build more rapport and trust with students and clarify our questions. In light of the critiques of FTS, we were interested in how much emphasis students placed on personal responsibility for healthy eating, and the extent to which they were able to identify larger, structural influences. Since we interviewed students three times throughout the school year, we were able to first characterize students' baseline knowledge and thinking. Then, as the school year progressed, we were able to example how their thinking may have been influenced by the FTS programming.

Student Focus Groups

We invited a group of twenty-five students to participate in semi-structured focus groups (see Appendix C for protocol). These focus groups met twice during the school year, and their aim was to understand students' knowledge and behaviors around sustainability through a directed brainstorming activity. Twelve students returned the necessary parental permission and assented

to participate in the focus groups (48%). The twelve students were divided into two groups (Table 1.1).

Participant Observation

Participant observation of FTS activities consisted of weekly data collection sessions throughout the school year and summer programming. The purpose of this participant observation was to observe FTS activities at HMS. Some questions that guided these sessions include: what types of FTS activities are students participating in? How do students, staff, and teachers interact with one another during these activities? What messages are teachers conveying through their FTS lessons? Over this time period, AB conducted 73 hours of observation (see Table 1.2). During each observation session, which lasted anywhere from 1 to 3 hours long, AB jotted down brief notes of the interactions, conversations, activities, and people who were involved. Within 1 to 6 hours after the observation, these notes were translated into detailed written descriptions of the session.

Table 1.2: Participant Observation Log

Type of Activity	Number of Hours
Classroom	7
Cafeteria	7
Gardening	30
Culinary	29
Total:	73

Staff Interviews

At end of the school year, we conducted one-on-one interviews with key members of the squad (n=5) (see Appendix D for protocol). The purpose of these interviews was to characterize the

FTS program goals as defined by the Squad, how they think about the key issues students face, and how their goals influence the messages that students take away from the programming.

Qualitative Analysis

All interviews and focus groups were audio-recorded and transcribed verbatim. The transcripts were then analyzed using an iterative, inductive and deductive approach to identify and index key analytical categories related to our research questions in a process commonly referred to as coding (Miles and Huberman 1994; Saldana 2016). We used Atlas.ti software to facilitate this systematic qualitative data analysis (Scientific Software Development GmbH. 2012). More details on specific conceptual frameworks and types of coding methodology used for each analysis are found in each of the corresponding chapters.

Positionality

I come to this research project with an undergraduate degree in environmental studies. Upon graduating, I worked as an environmental educator and agricultural apprentice and educator for 6+ years at various residential environmental education centers, nature centers, working farms, community gardens, and educational farms throughout New England and Georgia. I am passionate about environmental and experiential education as a way of teaching that can make important global issues, such as climate change and food system sustainability, come to life for students. I am also interested in the ways that food can bring diverse communities together, such as I experienced when I worked for a food justice organization in Maine. While immensely excited by this kind of work, I also see its limitations. Students come to these places as field trips lasting anywhere from 2 hours to a week, have a dynamic, fun experience, and then go back to

their regularly scheduled school. I began to question, what is the impact of this type of teaching? Are students seeing the connections to their everyday lives? Or is it just a fun trip they had in a place they don't see as connected to their everyday experience? I then became interested in school gardens as a way that this type of teaching – experiential and environmental education – could be brought to students' everyday school world. Would this type of learning have more of an impact? Could it be more transformative for the communities in which it was situated? Could it transform classroom learning to be more dynamic? These are the questions that guided my interest in coming back to graduate school, and my work in this research.

Road Map

This thesis contributes to a small body of qualitative FTS research that investigates the impacts of FTS programming (Ohly et al. 2016; Hayes-Conroy 2011). Qualitative data illustrates social FTS outcomes such as educational outcomes, well-being, and relationship-building that are not captured by quantitative studies. Our work also brings student and teacher voices to the forefront of FTS research. In this way, our work allows us to characterize the ways in which student and teacher thinking maps onto the social critiques of FTS, which are often not grounded in data.

This thesis is divided into three main data chapters. Chapters 2 and 3 are manuscript-style chapters, while chapter 4 is a data chapter. Chapter 2 draws on our participant observation and interviews with the Sustainability Squad. It characterizes how the FTS program at HMS affords more collaborative work in the classroom and collective responsibility in the cafeteria. Chapter 3

presents our student interview data and looks at how students think about healthy eating in the context of FTS. Lastly, our data third chapter works from our focus group data and demonstrates how students think about sustainability. In presenting these data, we illustrate a holistic picture of how FTS impacts the landscape of HMS. Our case study findings corroborate results found in a handful of other qualitative and mixed methods studies. In conclusion of this thesis, Chapter 5 draws links between our findings and other studies, demonstrating the larger implications of our research. We end with suggestions for further research in this area.

Ethical approval: "All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards."

Informed consent: Informed consent was obtained from all staff members interviewed. We obtained parental/guardian consent and student assent from students who participated in interviews and focus groups. Parent and guardians received study information and had the opportunity to opt students out of participation the student survey and participant observation, to which students provided assent. This study was approved by UGA's Internal Review Board.

CHAPTER 2

"Foreign soil and common ground for everybody": How the collaborative work of farm to school can disrupt neoliberalism in public schools

Introduction

The farm to school (FTS) educational movement has risen in popularity over the past twenty years, currently reaching 42% of all K-12 schools across the United States (USDA 2015). FTS programs take an interdisciplinary and experiential approach to food systems education through increasing procurement of locally grown fruits and vegetables in school cafeterias, planting and maintaining school gardens, and related experiential education activities across the curriculum (Joshi et al. 2014). FTS has been celebrated for its unique approach to nutrition education amidst the proliferation of chronic diet related diseases in children (Berezowitz et al. 2015; Bontrager Yoder et al. 2014; Ratcliffe et al. 2011). At the same time, FTS has been critiqued as recreating neoliberal structures that further circumscribe social inequality and thus health disparities rather than working toward a more just food system (Allen and Guthman 2006; Meek and Tarlau 2015; Pudup 2008).

Despite the vigorous debate on the merits and potential for FTS to change the food system or affect health disparities, research on its effect is relatively scarce. The critiques are largely theoretical and do not account for the complex social outcomes of real-world FTS programs. With this in mind, our ethnographic research at Hickory Middle School (HMS) seeks to describe the structure of one particular FTS program and illustrate its associated social outcomes.

Through this case study, we provide a model to demonstrate how a dedicated team of school-based personnel can foster positive social change through FTS and how this change mitigates the neoliberal influences on public school education. To contextualize our research, we begin by reviewing social critiques of FTS and background on how US public school systems have been influenced by neoliberalism.

Literature Review

The Neoliberal Context

Neoliberal economic philosophy has had a complex and ubiquitous force on western society since the 1970s. For the purposes of this article, we will briefly discuss its effect on food systems and education, and its intersection with FTS. Authors Alkon and Mares (2012) write that "neoliberalism is a political economic philosophy that asserts the primacy of the market in attending to human needs and wellbeing, and re-orients the state towards the facilitation of market mechanisms" (p. 348). As a philosophy, neoliberalism places the onus for well-being on individuals and private organizations rather than collective action or state-level policy-based solutions (Davies and Pansel 2007). By emphasizing market deregulation, increasing efficiency and trade liberalization, neoliberalism, in essence, values "profit over people" (Chomsky, 1999). Societies like the US and UK which have adopted these policies have increasing gaps between the rich and poor (Stone 2016).

Neoliberal policy affects food systems and health by creating a powerful corporate food regime and a host of associated social issues. Commodity foods are more cheaply priced and readily available than their healthier alternatives (Minkoff-Zern 2012); farm workers are underpaid,

overworked, and many times food insecure (Quandt et al 2004); and changing economic markets make it hard for family farms to survive (Suess-Reyes and Fuetsch 2016). In the US and around the world, low-income and communities of color are disproportionately affected by these food-related issues, creating problems such as diet-related diseases, food insecurity, and loss of farming livelihood (Otero et al. 2013).

Neoliberalism also has shifted the focus of education. Under Keynesian economics of the 1960s and 70s, education and other social institutions were valued as improving 'human capital' (Davies and Bansel 2007). Neoliberal economics, in contrast, views education as a commodity that can be measured, "bought and sold like anything else" contributing to the rise in standardized testing as a universal measure of educational success (Davies and Bansel 2007, p 254). Since poverty creates stress in the form of food insecurity, violence, emotional and physical trauma and a whole host of situations that make it more difficult for students from low socioeconomic (SES) households to learn in school, schools with higher income populations are more likely to reach standardized testing benchmarks (McGee 2004; Orfield 2001). Schools that 'underachieve' on standardized tests are judged with a "no excuses" approach enforcing another pillar of neoliberal ideology: meritocracy, in which individuals are framed as responsible for their own success or failure (Picower 2011; Lakes and Carter 2011). Schools also practice "tracking" students, where students are separated into different classes by perceived academic ability, which ends up segregates students largely along class and racial lines and ensures that privileged students have increased access to opportunity (Jones and Vagle 2013). This creates a cycle of negative reinforcement where the very conditions that have created economic stratification, also create educational stratification. It also ignores the "structural and historical

root causes of our increasingly stratified society" and detracts from working toward collective solutions to economic equality (Sondel 2015, p. 291).

Farm to School Context

On paper, FTS programs attempt to address some of the health-related disparities caused by neoliberalism. For example, the National Farm to School Network notes that,

> Despite the investments made over the past two decades to mitigate the impact of food deserts, disparities persist as evidenced by higher rates of malnutrition and hunger in vulnerable communities. In order to address these disparities, efforts must be anchored in community-driven solutions that are focused on fostering equity. Farm to school programs are symbolic of these solutions (Joshi et al. 2014).

In terms of achieving these outcomes, a growing body of quantitative, nutrition-based studies demonstrate that FTS programs have been able to modestly increase student fruit and vegetable consumption during the school day, as well as improve their attitudes towards fresh produce (Berezowitz et al. 2015; Ratcliffe et al. 2011; Ozer 2007; Yoder et al 2014; Robinson-O'Brien 2009). However, these studies each only express moderate increases, and furthermore, food consumption studies and attitude change are "notoriously difficult to measure" (Ohly et al. 2016).

Qualitative research demonstrates several social benefits of school gardens in particular (Moore, Wilson, Kelly-Richards, and Marston 2015; Ohly et al. 2016). The "playful labor" (Moore et al.

2015) that students participate in through school gardens has been shown to create the conditions for increased cooperation toward shared goals (Ohly et al. 2016; Ahmed et al. 2011). This cooperation and social interaction allows for students to build cultural awareness and social cohesion, and improve student-teacher inteactions (Block and Johnson 2009; Cutter 2009; Ahmed et al. 2011).

At the same time that FTS work has been found to have positive nutrition and social outcomes, a dedicated group of critical scholars charge that FTS ends up promoting (instead of working against) neoliberal values. They argue that FTS promotes neoliberalism through its reliance on privatized funding and volunteer labor, creating a situation where more affluent schools can better support FTS programs (Allen and Guthman 2006), a finding also corroborated by the USDA (Ralston et al. 2017). Secondly, by focusing on outcomes such as improving standardized test scores, obtaining normative body sizes, and educating about 'healthy choices,' they argue that FTS programs rely on the rhetoric of personal responsibility rather than educating about the structural causes of food insecurity and organizing for collective solutions. They further warn that "'sustainable' gardening" programs are a "depoliticized" form of education that distracts from addressing the real harms of neoliberalism (Meek and Tarlau 2016, p. 239). Instead, they call for food systems education that explicitly engages in critical pedagogy, food justice, food sovereignty, and agroecology, in order to disrupt the neoliberal narrative.

We appreciate these critiques, yet we also recognize the positive potentials of FTS. Therefore, our research seeks to understand whether and how students learn about pressing social issues of food insecurity and sustainability through FTS participation. Our work engages with the social

critique of FTS by investigating the social experience of students, teachers, and community members with FTS at our research site. For the purposes of this chapter, we specifically ask *What types of social outcomes do we observe among students and school body participating in an integrated FTS program?* We present these findings discuss how they intersect with social critique of FTS.

Research Context

Research Site Description

Our research site, HMS, is an economically and racially diverse public middle school located in Rivertown, a town of approximately 110,000 located in the Southeast US. HMS is a majority minority public middle school that serves several low-income neighborhoods, which are overwhelmingly African American, as well as wealthier neighborhoods, which are overwhelmingly white (see Table 1.1).

The free and reduced lunch rate at HMS during the 2015-2016 school year was 63.6%. However, beginning in 2016 through USDA's Community Eligibility Provision for high poverty districts, the district now provides free breakfast and lunch to all students who attend Rivertown schools, including HMS.

Rivertown has been a part of the growing FTS movement for most of the last decade. The majority of its public schools have on-site vegetable gardens and source local produce in their cafeterias. One of the most established and well-integrated programs in the district exists at

HMS. Over the past five years, the FTS program at HMS has re-shaped the entire landscape of the school.

The FTS programming at HMS has three main components: community partnership/outreach, experiential education, and waste reduction (see figure 2.1), which are inter-related in a complex series of relationships. The program centers on the school's 7000 ft^2 vegetable and fruit garden, which is planted, weeded, and harvested by students in the Agricultural Science (AS) class. Produce from the HMS garden (supplemented by the nearby university student farm) is then used in a variety of ways. Students enrolled in Family and Consumer Science (FCS) and Low Incidence Disability (LID) classes use produce for their cooking labs. AS students harvest produce and deliver it to the cafeteria for a monthly 'garden bar.' Students help run a weekly, afterschool vegetable stand. Produce is also prepared by students into a series of community meals served throughout the school year and during the summer program. Lastly, students collect food waste to compost in the garden and they collect uneaten fruit from the school lunches, which is repurposed in cooking labs in FCS and LID classes.

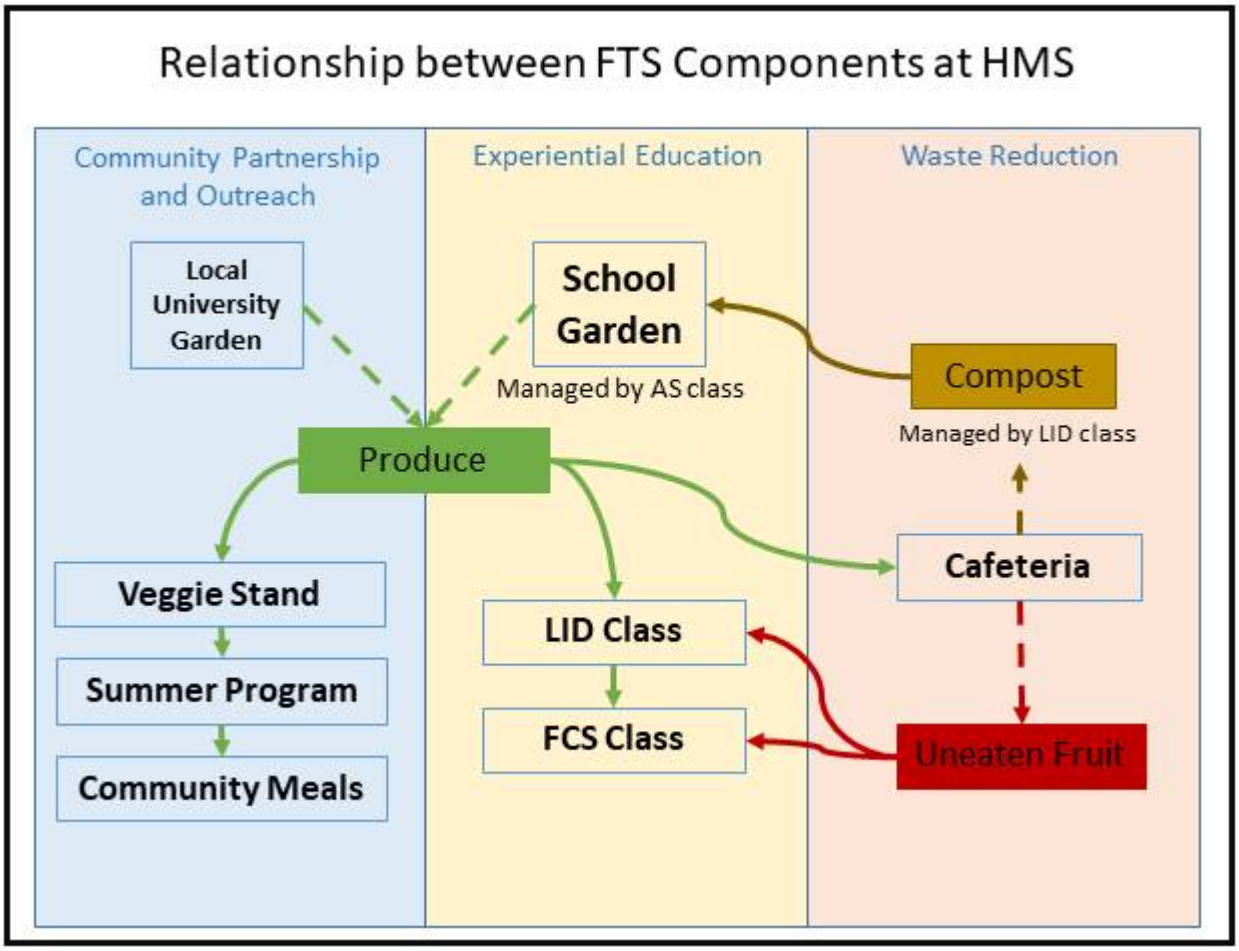


Figure 2.1: The FTS program at HMS

A core group of HMS teachers and staff who call themselves the "Sustainability Squad" have shaped the FTS landscape and programming over the past six years. The Sustainability Squad (henceforward referred to as the Squad) includes Eliza (the FCS teacher), Michelle (the AS teacher), Tom (the school principal), Christine (an AmeriCorps VISTA), Virgil (a district-level Middle School Garden Coordinator), Justine (an LID teacher), and a handful of other teachers and staff. When asked about how the program began, the school principal remarks on the synergy of the Squad and their shared vision of using the garden to incorporate an over-arching

mission of environmental stewardship throughout the school. While the AS, FCS, and LID classes existed prior to the FTS program, the collective synergy and interest of the Squad has made FTS central to the way their classes operate.

In addition to the organic nature of the Squad coming together, the FTS programs are supported through strong community and institutional support. A nearby university supports the program through its public outreach division, hosting an AmeriCorps VISTA who manages many aspects of FTS at HMS. More recently, due to the success of the program at HMS, a Middle School Garden Coordinator position was created through a three-way financial partnership between the university, Cooperative Extension, and the Rivertown School District. This position now oversees FTS programs and an AmeriCorps VISTA at each of the four public middle schools in Rivertown.

Research Design and Methods

During the 2014-2015 school year, we designed our research goals and questions in collaboration with the Squad, drawing on the principles of participatory research (Cornwall and Jewkes 1995). We received approval from the school district and UGA IRB to conduct this research. During the next school year and summer, we conducted our research using mixed quantitative and qualitative methods. In this paper we draw upon participant observation of FTS activities, a 6th grade student baseline survey, focus groups with students, as well as interviews with administrators, teachers, and staff (see Figure 1.1).

Student Survey

Approximately 83% (158) of the 6th grade class completed the survey through their AS and FCS classes at the beginning of the school year. The survey was administered through UGA's Qualtrics platform and it collected students' demographic information (see Table 1.2), and baseline data on students' previous gardening experience, science content knowledge, sustainable behaviors, attitudes toward citizenship, and knowledge of the food system.

Student Focus Groups

We invited a group of twenty-five students to participate in semi-structured focus groups. These focus groups met twice during the school year, to learn about students' knowledge and behaviors around sustainability through a directed brainstorming activity. Twelve students returned the necessary parental permission and assented to participate in the focus groups (48%). The twelve students were divided into two groups (Table 1.4).

Participant Observation

Participant observation of FTS activities consisted of weekly data collection sessions throughout the school year and summer programming. The purpose of this participant observation was to observe FTS activities at HMS. Some questions that guided these sessions include: what types of FTS activities are students participating in? How do students, staff, and teachers interact with one another during these activities? What messages are teachers conveying through their FTS lessons? Over this time period, AB conducted 73 hours of observation (see Table 1.5). During each observation session, which lasted anywhere from 1 to 3 hours long, AB made brief notes of

the interactions, conversations, activities, and people who were involved. Within 1 to 6 hours after the observation, these notes were translated into detailed written descriptions of the session.

Staff Interviews

At end of the school year, we conducted one-on-one interviews with key members of the Sustainability Squad (n=5). The purpose of these interviews was to characterize the FTS program goals as defined by the Squad, how they think about the key issues students face, and how their goals influence the messages that students take away from the programming.

Qualitative Analysis

All interviews and focus groups were audio-recorded and transcribed verbatim. The transcripts were then analyzed using an iterative, inductive and deductive approach to identify and index key analytical categories related to our research questions in a process commonly referred to as coding (Miles and Huberman 1994; Saldana 2016). We used Atlas.ti software to facilitate this systematic qualitative data analysis (Scientific Software Development GmbH. 2012). Coding involves identifying a "word of short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of data" (Saldana 2016, p. 4). In short, coding aids researchers in identifying and interpreting important patterns in qualitative data.

We began analysis for this portion of our research using an "initial" coding process (Saldana 2016, p. 115) in which we identified the concepts emerging in our interviews and focus groups, particularly how participants themselves communicate about their work with FTS at HMS, such as the collaborative nature of FTS work and building connections with peers who are from

different backgrounds. These initial codes were informed by themes identified from the literature and arising from the interviews themselves. These codes were then triangulated with trends in the student survey and events observed during participant observation. After triangulation, we then went through the processes of "pattern coding" (Saldana 2016, p. 236) and "focused coding" (Saldana 2016, p. 239) in which we grouped similar codes into broader thematic categories (e.g. relationship building and collective responsibility). These broader categories arose from the data themselves and were interpreted using the conceptual frameworks we outline below.

Conceptual Framework

Our conceptual approach is informed by social critique (Allen and Guthman, 2006; Meek and Tarlau 2016), materiality (Hayes-Conroy 2010), and affective/playful labor (Moore et al. 2015). Early in our research, we became interested testing whether and how the social critique of FTS plays out on the ground. During our year of data collection, we noticed that although some social phenomena corroborated the critique, the majority of day-to-day social phenomena of FTS at HMS was not explained by the critique. This led us to the frameworks of materiality and affective labor, which more accurately explain the reality of how FTS socially organizes students, teachers, and staff at HMS. This approach echoes the work of Figueroa and Alkon (2017), who focus on the social practice of everyday life in order to move beyond describing whether alternative food projects "are or are not neoliberal" (p. 210). We draw upon these three frameworks to makes sense of the social outcomes we observe in the HMS program. This approach adds to a small body of literature that is neither an uncritical celebration nor sweeping critique of FTS, but rather seeks "middle ground" (Carlisle 2015; Goodman and DuPuis 2002;

Goodman et al. 2011; Hayes-Conroy 2010; Kloppenburg and Hassanein 2006)**.** We believe this approach is important in order to provide contextualized data and discussion that engages those working with FTS as partners in working toward more equitable food systems.

Results and Discussion

Students at HMS demonstrated three primary social outcomes through their FTS participation: participating in affective labor, building relationships across difference, and collective responsibility. These emerged within the experiential education and waste reduction activities of their FTS program. Some specific terminology will be used throughout this section. HMS categorizes FCS and AS as 'connections' classes, along with art, music, languages, and physical education. The school categorizes academic classes such as language arts, math, science, and social studies as 'core' classes. We will use this terminology throughout the rest of the paper.

Experiential Education

The experiential education portion of the FTS program at HMS encompasses the cooking and gardening activities that students engage with in their AS, FCS, and LID classes. These activities are collaborative and hands-on, two hallmarks of experiential education. Michelle, the AS teacher, reflects on this in her interview, stating,

> [In] the end, because there are twelve different [AS] classes… I want them to see it's a huge process and that everyone has a hand in it, when we're all finished, you know, like at the plant sale as kind of a culminating event or maybe the garden bar.

When we observed students learning in the garden or harvesting and cooking produce, they became deeply immersed in the collaborative work of weeding, whisking, shoveling mulch, feeding the animals, picking lettuce, or hammering nails in the chicken coop. Students' feet, hands, and bodies moved, working side-by-side toward the shared goal of growing food. This is an example of what Hardt (1999) calls "affective labor" or "biopower from below," flipping the meaning of the Foucauldian term (p. 98). Affective labor encompasses collective work projects such as gardening and cooking that create social networks and challenge neoliberalism by forging relationships that exists outside the forces that discipline them (Hardt 1999; Singh 2013; Laaksoharju et al. 2012).

In our research of the HMS program, the affective labor of experiential education creates two distinct social outcomes. First, the FTS program redefines success to be both collaborative, instead of individual, and concrete, instead of abstract. Michelle's quotation clearly illustrates what we also observed in our participant observation: the cooking and gardening activities associated with the FTS program were worked on collectively. Students worked together toward shared goals such as a harvest for the garden bar, or cooking a meal served to the community. Furthermore, the product of these collective efforts was often concrete, something that you could taste, see, smell, and touch. Principal Tom reflects on in his interview, stating, "You can go to FCS and learn how to make kale smoothies, make [a] kale smoothie, and drink it and it's a task you've done and you're successful at."

The Squad reflected that FTS allows students who are not experiencing "success" to have a place where they can thrive. Eliza, the FCS teacher, described this phenomenon to AB during one participant observation session, excerpted below:

> *Later, when Eliza comes back in [the classroom after releasing the students], she immediately starts telling me about [Student A]. She says that in the traditional classroom setting he struggles, it's not his strong suit. But in the kitchen, he works very well and is always wanting to help out. She says that she really enjoys that in her class, some students shine who do not shine with the typical schoolwork.* [Field Notes, October 16, 2015].

Neoliberal school reform has narrowed the pedagogical techniques that core class teachers employ to be comprised mostly of individualized, learning in which students are solely responsible for their own performance (Scogin et al. 2017). This in turn limits the definition of "success" in school to the ideals of meritocracy; that students' successes and failures are their own responsibility regardless of their situation (Davies and Bansel 2007). While individualized work does still occur in FTS classes and collaborative work occurs elsewhere in the school, FTS has a far more collective and hands-on focus than elsewhere in the school. This disrupts the neoliberal narrative within students' school day, and creates a place where students who do not succeed in an individualized, abstract learning environment can excel.

The second social outcome of experiential education in FTS is that it facilitates relationships across socioeconomic and racial difference—relationships that are normally constrained in

traditional learning environments. Students noticed and reflected on this relationship-building capacity of FTS. Referring to FTS activities, one student who participated in a focus group remarked,

> People can make friends when they're doing sustainable things. And even if they are different from each other, then they can still make friends and even if one of them speaks another language, you don't really have to talk to each other when you're doing work. You can just like sort of work together.

Several key characteristics related to students' FTS participation allow them to more readily form these relationships. First, as we discussed above, affective labor increases students' social interactions with one another, compared to individual assignments. Second, both the garden space and related work is novel and unfamiliar to students, which allows students to be more open and receptive learning as well as to the students around them. In our student survey, only 35% report that either their grandparents or parents have a vegetable garden. Michelle echoed this finding in her interview, stating that if students have any connection with gardening "it's a grandparent… something from the past."

In his interview Virgil also reflected on how this novel environment breaks down social barriers, paving the way for students to build relationships. He says,

> [The garden is] like a school trip somewhere and nobody's been there before and everybody's kind of quiet and kind of like, okay, 'Where do I fit in?' 'What is my

> place?' 'This is not normal.'…So it's both foreign soil and common ground for everybody… It kind of grows their circle of awareness.

This theme is prevalent throughout the literature on experiential education. Falk and Balling (1980) in particular demonstrate that novelty is essential for students to remain engaged, and that the "typical contained classroom may have too little environmental novelty" (p. 8). Therefore, the novelty of the garden environment creates a space where are more open to making connections with fellow students across SES and racial lines.

Third, because AS and FCS classes are not "tracked" according to perceived academic ability, students have greater opportunities to interact and collaborate with students in different social groups. Tracking, which occurs in most core classes at HMS, is a practice where students are placed in sections of a given class based on prior academic achievement. This practice stratifies students by social class and race, creating a caste-like atmosphere in schools (Rist 2000). Tracking "ensures that more advantaged children and youth have access to more advantage and less advantaged children and youth have access to less advantage" (Jones and Vagle 2015, p. 136). In these ways, academic tracking reinforces the social stratification caused by neoliberalism.

The non-tracked FTS program and other connections classes certainly do not entirely undo the effects of tracking elsewhere in the school. However, they *are* an opportunity within the school day for students to interact across race and class differences. This collaboration creates greater equality of status, common goals, and intimacy of interaction, which are social elements

considered essential in breaking down stereotypes in a diverse educational environment (Gurin et al. 2004; Hughes 2014). In this way, FTS disrupts the social stratification seen in core classes at HMS, which is a product of neoliberal economic policy.

The two social outcomes discussed above are well documented in literature on experiential learning and its related component, affective labor. Increased collaboration, social interaction, emotional well-being, and motivation for coming to school (i.e. redefining success) are all known benefits of experiential learning (Bohnenberger and Terry 2002; Gama and Fernandez 2009; Scogin et al. 2017). These two outcomes that are observed specifically in garden-based learning, which has been associated with empowerment for students who do not excel in traditional academic settings (Ohly et al. 2016) and increased cultural awareness and cohesion (Cutter-McKenzie 2009).

Collective Responsibility around Waste Reduction

FTS has also transformed the atmosphere of the HMS cafeteria. One component of this is the monthly lunch menu highlighting locally grown products and monthly "garden-bar" that features school-grown produce. However, the largest transformation that has taken place in the cafeteria is a collective effort toward waste reduction. This collective responsibility differs from the classroom collaboration because it is a school-wide effort that encompasses the entire school (students, teachers, and staff) toward one shared goal of reducing waste. We observed this collective action at work one day during participant observation.

> *Four Low Incidence Disability (LID) students and one [teacher's aid] come down to outside the lunchroom to help [Virgil] weigh and empty the compost and recycling. They do this regularly on every Monday and Friday. One of the students is SUPER excited to be there. Her teacher tells [Virgil] that she has a special interest in the composting and recycling, and wants to become more involved. Students take turns putting the bins on the scale—and get extra excited about pressing the button on the scale that holds the weight intact. One student records the weights in the sustainability binder. After everything is weighed, the containers go back on the carts, and we wheel them down to recycling bins behind the school. Students take turns emptying them into the big bin with [Virgil]'s help. Then we go back through the school and out to the compost piles to dump the compost. We head back into the ag science courtyard where students spray out the bins, emptying the dirty water into a compost container next to the greenhouse* [Field Notes, October 2, 2015]

There are two main components that comprise the waste reduction component of the FTS program, composting and a "share-bowl" program. These two components inspired the others in a synergistic effect, propelling a diverse set of actors into action. First came the cafeteria composting.

Coming from a background of working at environmental education centers where composting food waste is routine, Virgil began his VISTA service with knowledge of how to turn the school food waste into rich organic material for the school garden. He thought this would be a helpful addition to the FTS program, demonstrating the complete cycle of the food system. Color-coded

cans now line the center of the cafeteria. Green cans are for compost, blue for recycling, and black for landfill waste. Signs are posted on the different cans displaying what items go in each. Justine, the LID teacher, saw this as a unique opportunity for her students to become involved. Each Monday and Friday, she brings a dedicated group of her students to weigh, record, and empty the compost and recycling, as seen in the above example. Their efforts have been central to the sustainability of the food waste reduction program, as well as giving this group of students a sense of ownership in an exciting school-wide project.

Immediately after starting the composting program, however, the Squad noticed many whole pieces fruit were ending up in the compost pile. They saw this as connected to the FTS program's main goal, which is to teach students about food system sustainability. So they created the "share-bowl" program, where students place any unwanted fruit, or pre-packaged item in a bowl at the center of the table. This fruit then gets re-used two ways. Other students at the table can then choose items out of this bowl during lunch, and any food left over at the end of the last lunch period is brought to the FCS and LID classroom refrigerators. Eliza and Justine both incorporate this food into cooking labs with their students.

One somewhat unlikely character in this story is the school resource officer, Charlie (see Figure 2.2). At the end of each lunch, Charlie and Christine help kids figure out what is compostable and recyclable, and collect the fruit from the share-bowls. Charlie's work with the waste reduction program has a dual effect. From a practical perspective, he is an integral part of teaching students how to sort their lunch waste. Beyond this, his involvement allows him to have different types of interactions with students, facilitating a more community-based model of

policing. One of the main goals of community policing (as compared to traditional policing) is to create a "collaborative partnership between the law enforcement agency and the individuals and organizations they serve to develop solutions to problems and increase trust in police" (Jahangeer, 2017, p 10). Charlie's involvement in the HMS cafeteria helps to model this type of law enforcement, which is built more on mutual trust and relationships rather than merely enforcing the law in specific incidents.

Figure 2.2 School Officer with a share-bowl. (Photo used with permission.)

The waste reduction program at HMS demonstrates how FTS programming is able to organize a diverse set of actors to collectively address a complex, natural resource issue. After the Squad organized the school around composting, food share bowls, and reusable trays and utensils, it was also necessary to involve district level support. The Squad ran their program protocols through the district nutrition director, who after a few adjustments, gave it the district food safety stamp of approval. These collective efforts have since rippled out to the other district middle

schools and through their shared efforts by the end of 2016, the Rivertown middle schools have collected and redistributed 5,777 whole pieces of fruit and composted 11,357 lbs of food waste. The Squad is now in discussions with the county municipal waste department to start a pilot collection of food waste to be composted with county leaf and limb waste.

Waste reduction is a prime example of what Marshall (2013) calls a "wicked problem of collective action" (p. 185). Biermann et al (2010, p. 202) argue that the ecological impact of humans on our planet is pervasive to the point that we "could inadvertently alter the Earth System in ways that may prove irreversible and inhospitable to humans" (as cited in Marshall, 2013). Dwindling natural resources are a shared social-ecological issue which mainstream neoliberalism is ineffective in addressing since it operates by exclusively rewarding individuals (rather than communities) in the marketplace (Marshall 2013). Therefore, natural resource issues require collective solutions that do not rely exclusively on markets, ensuring that benefits are commonly (rather than individually) reaped.

Not only does the waste reduction component of the FTS program work against neoliberalism as a demonstration of collective action, it is also an example of agroecology. Agroecology is a set of sustainable farming practices that mimic natural ecosystem functions in order for biodiversity and agriculture to coexist in the same area (Bernard and Lux 2017). Composting food waste and reusing uneaten produce on the school site, is an example of nutrient cycling, one component of this set of practices. Meek and Tarlau (2015) point to agroecology as a key step in working against a food system influenced by neoliberalism, reducing the need for outside inputs in food production.

Limitations / Challenges to Disrupting Neoliberalism

Our research demonstrates that thoughtfully organized FTS programs can help to destabilize the neoliberal structures of our current food and education systems. At the same time, it is important to recognize that FTS is "not a panacea for all the ills of modern education and socioecological relations," (Moore et al. 2015, p. 407). FTS is still imbedded within a larger neoliberal school reform structure, which is nested within a larger economic structures that produce vast inequalities across Rivertown and the US as a whole.

The Squad itself is very cognizant that FTS is not a silver bullet. Throughout our interviews, the Squad discusses at length the myriad issues that students face when living in poverty and the immense class and racial divides that is reflected in the HMS student body. They also express that the current school structure impedes their ability to address these issues. Eliza notes,

> I really think about the lower income families that come here… I might see 'Joe' for literally two hours a week, right? And it's hard to have an impact because Joe has ten teachers here and he also has no parents. And he's getting ping-ponged from family member to family member, and you know, his parents were murdered. There's always a back story that is so intense in how they're affected in their just like everyday life… I know there's only so much that we can do. I wish that there was more, that there was an answer to reaching out to kids who need all that other stuff in their lives.

It is clear both through our conversations with the Squad and our observations at HMS that there is still much work that needs to be done beyond the FTS program to address and challenge neoliberal structures.

We also observed some key ways that the FTS program itself doesn't maximize its potential for always being able to work towards greater food system and educational equality. For one, the garden market, which is held after school once a week at HMS and offers half priced produce to SNAP recipients, is mostly attended by wealthier families who can afford to pick up their students at school. Also, despite the material ways that the FTS program creates a general spirit of collectivism, we continue to see how a reliance on personal responsibility and volunteerism underpins the success of the school's FTS efforts. For example, excited by the success of the waste reduction program, Principal Tom wanted to cut down on lunchroom waste even further and facilitated the replacement of Styrofoam lunch trays and plastic utensils with reusable trays and metal utensils. This presented the challenge of extra work needed to wash the trays and utensils, without extra staff. Reflecting on this, Tom says,

> We've talked about the plates and the forks and stuff and I go in there and all of a sudden they have the Styrofoam plates back and… they'll say "Oh, we're shorthanded. And so we don't have enough people." …And the last time I said, "If you're shorthanded, will you call [my administrative assistant] and tell her and I'll come do the dishes. I said that's how important it is for me. I will do the dishes."

While this demonstrates his dedication to the program, it is also an example of a relying on volunteer labor (albeit, from the school principal), one of the main social critiques of FTS programs (Allen and Guthman 2006).

Lastly, even though the FTS program creates important experiential and collaborative learning environment, Virgil and the VISTAs have had a hard time infiltrating core academic classes because of the pressures of standardized testing. In other words, while we believe that the FTS program is making important social progress at HMS, we recognize that there is still room for improvement.

Conclusion

The social critiques of FTS have stimulated an important discussion within the literature about the role and purpose of these programs. We whole-heartedly position ourselves as scholars and practitioners collaborating with educators to support K-12 public education that works toward greater social, economic, and environmental justice. We also agree that there is a vital need to explicitly incorporate a critical lens into K-12 food systems education. However, we also believe it is important to provide evidence that FTS programs are "much more complex, contradictory, and changing than current scholarship admits" (Hayes- Conroy 2011, p 67).

FTS is a complex teaching tool utilized in different ways across the United States. Nevertheless, our data demonstrate that when a dedicated and supported core of individuals (such as we saw with the Squad) collaborate, FTS can be a strong force for collectivism and collaboration in public school systems. These findings are further corroborated by other qualitative research,

demonstrating their positive contribution in creating more equitable food systems (Ohly et al. 2016; Cutter-Mckenzie 2009; Ahmed et al. 2011). And importantly, creating partnership with teachers and staff involved in FTS has the power to move the conversation further down the road of incorporating social justice within the program. When we investigate the material, we find that the social outcomes of the FTS program at HMS organize the school towards collaborative education and collective action. This challenges the critiques of Allen and Guthman (2006) and Meek and Tarlau (2015), who solely focus on the neoliberal forces at work in FTS. In fact, our data suggests that the FTS program at HMS may be a model (although imperfect) of the critical food systems education approach that Meek and Tarlau recommend.

CHAPTER 3

MIDDLE SCHOOL STUDENT PERCEPTIONS OF HEALTHY EATING IN FARM TO SCHOOL PROGRAMMING

Introduction

Farm to school (FTS) is a popular educational approach to food systems education used by 42% of all K-12 schools across the United States (USDA 2015). FTS employs a set of experiential learning activities that include procuring locally grown fruits and vegetables for school meals, planting school gardens, and educational activities that connect gardening and cooking to curricular content (Joshi et al. 2014). FTS is promoted by advocates for a host of ideas such as hands-on learning opportunities and increased connection with the natural world. This chapter will discuss one potential benefit, which is the promise that FTS will improve childhood nutrition by increasing the availability of fresh fruits and vegetables in students' diets and improving students' familiarity with fresh produce (Joshi et al. 2014; Berezowitz et al. 2015; Ratcliffe et al. 2011).

Research to date paints a complex picture of the impact of FTS programs on childhood nutrition. On one hand, several studies demonstrate that FTS has a positive impact by improving the nutritional value of school meals and modestly increasing student fruit and vegetable consumption (Joshi et al 2014; Berezowitz, Yoder, and Schoeller, 2015; Yoder et al, 2014). At the same time, critical scholars argue that FTS does not address the root economic causes of food insecurity and therefore exacerbates the issue by placing responsibility for health back on the individual (Allen & Guthman, 2006; Meek & Tarlau, 2015; Pudup, 2008). Other scholars

attempt to strike middle ground by demonstrating that FTS is neither a panacea for all of society's health-related ills, nor a neoliberal menace, but something far more complex (Hayes-Conroy, 2011; Kloppenburg and Hassanein, 2006). Regardless, all agree that there is a need for more research amidst on the impact of this seemingly ubiquitous educational movement.

This article emerges from a larger ethnographic study of the FTS program at Hickory Middle School (HMS), an economically and racially diverse middle school in the southeast, which we will call Rivertown. HMS established its FTS program in 2012, which is centered on its large school garden. Our research project is an interdisciplinary collaboration among JJT (an anthropologist embedded in a College of Ag), JHJ (faculty in the College of Education whose work has focused on civic education), and AB (graduate student who taught for 6 years in environmental and agricultural education). Broadly, our research objective has been to first characterize the experience of teachers and students who participate in the program. Second, we aim to partner with teachers through the process of participatory research (Cornwall and Jewkes 1995) to develop stronger programs that address the root economic causes of food insecurity.

The focus of this paper is to add a new element that has largely been absent from FTS research thus far: the voices of students themselves. We aim to characterize how middle school students participating in an established FTS program think about "healthy eating." Specifically, we investigate to what extent do the critiques of FTS hold true? Is FTS further reinforcing personal responsibility around health? What are the messages that students take away? We begin with a review of the literature around FTS and healthy eating. We next present our research methods and results, first characterizing how students think about health and food broadly,

followed by the ways in which the FTS activities influence student thinking around health, food, and community.

FTS, Healthy Eating, and Student Nutrition

Schools across the United States engage in FTS programs for a variety of reasons ranging from increased hands-on and environmental education opportunities, to improved farmer livelihood and beautified school grounds. However, one of the most cited rationales for schools participating in FTS is in improving childhood nutrition (Yoder et al. 2014; Berezowitz et al. 2015; Robinson-O'Brien 2009; Ozer 2007; Joshi et al. 2008.).

The main pedagogical approach of FTS programming is to increase student overall knowledge of farming, gardening, and cooking from scratch through experiential learning. Advocates argue that when students participate in these types of activities, their attitude toward and consumption of fruits and vegetables will improve (Yoder et al. 2014). Several studies demonstrate that garden-based FTS programs can modestly increase student fruit and vegetable consumption during the school day (Berezowitz et al. 2015; Ratcliffe et al. 2011; Ozer 2007; Yoder et al 2014; Robinson-O'Brien 2009). In addition, two studies show that students increase their preference for certain vegetables and fruits that were highlighted in FTS programming (Ratcliffe et al. 2011; Ozer 2007). Lastly, one study demonstrates that FTS programming improves students' attitudes toward fruit and vegetables overall (Ozer 2007). While these studies do paint a positive picture of the impact of FTS on students' attitudes toward fruits and vegetables, the gains are modest at best, and each is careful to express the limitations of achieving scientific accuracy in a school setting.

Additionally, schools play an important role in supporting student nutrition through the USDA's Child Nutrition Programs, which include the National School Lunch Program (NSLP),

School Breakfast Program (SBP), dinner, and Summer Food Service Program. Students living at 130% of the federal poverty guideline qualify for free lunch and breakfast, while those living at 185% of the poverty level qualify for reduced price meals (Shahin, 2017). Every day, approximately 31 million children participate in the NSLP and about 10 million in the SBP (Berezowitz et al., 2015). The cafeteria portion of FTS programs are run in conjunction with the NSLP, therefore reaching food insecure students who are most vulnerable to diet related diseases (Ratcliffe et al. 2011; Yoder et al. 2014; Berezowitz et al. 2015; Ozer 2007; Joshi et al. 2008).

At the same time that FTS is celebrated, another body of literature points out the limits of the FTS nutrition education model. Like any educational project, FTS is inherently political and contains embedded ideals about what it means to be a good citizen. Furthermore, FTS programs can take on a missionary approach assuming that if citizens just have the right knowledge and integrity, then they will 'eat right' (Kimura et al. 2014; Guthman 2008). At the same time that these programs attempt to "bring good food to others" through nutrition education, they rarely engage the racial and structural inequalities embedded in the food system, which limit access to healthy food through lack of transportation, low paying jobs, and food deserts (Guthman 2008). Therefore, when FTS programs merely educate students about 'making healthy choices' (i.e. personal responsibility) they can further inscribe inequality by neglecting to advocate for the collective action and structural solutions that are needed to make our food systems more equitable (Allen and Guthman 2006; Meek and Tarlau 2015; Pudup 2008).

Taken as a whole, the literature suggests that FTS has a complex and imperfect effect on student nutrition. Our research aims to add student voices to this growing body of literature, in order to characterize what messages students glean from these programs. Specifically, we are interested in knowing to what extent FTS instills in students ideas of personal responsibility

and/or knowledge of structural barriers to healthy eating. By characterizing how middle school students think about healthy eating in the context of FTS programming, we hope to further illustrate the impact of this educational movement.

Research Context

Public schools in Rivertown have embraced the FTS movement through a variety of programs, including sourcing and highlighting local foods, establishing school gardens, and running cafeteria-composting programs. Hickory Middle School (HMS) is one of four public middle schools in Rivertown and serves our research site. HMS has a well-integrated FTS program that serves 6th, 7th and 8th grade students through its cafeteria, Agricultural Science (AS) and Family Consumer Science (FCS) classes, as well as after school and summer programs. The HMS student population comes from low-income neighborhoods, which are overwhelmingly African American, as well as wealthier neighborhoods, which are overwhelmingly white (see Table 1.1). Through a district-wide Community Eligibility Provision for high poverty districts, all HMS students eat free school breakfast and lunch.

Mirroring the wealth disparity in ACC, HMS serves students from both food secure neighborhoods, as well as neighborhoods experiencing very high rates of food insecurity. The census tracts that feed into HMS range from experiencing less than 10% to those that experience more than 30% food insecurity (Shannon and Hauer 2015). This is of particular interest for our study, since we are interested in the impact of FTS programs on how students think about the structural influences on nutrition. The broad range of food security status in Rivertown translates

to diverse lived experiences with food. Our student population ranges from those who struggle to secure their next meal to those who have parents that shop weekly at one of several farmers markets. This in turn translates to how they think about nutrition and how they interpret the messages of FTS programming.

FTS Components at HMS

The FTS program at HMS transforms the entire school landscape. The school entrance prominently features a 7000 ft^2 vegetable garden and fruit orchard surrounded by an 8 ft tall deer fence. Both the AS and FCS classes regularly use the garden, and students mill around outside with their teachers wielding shovels, wheelbarrows, and harvesting bowls. Around the corner from the garden, there are three massive wooden composting bays full of food scraps from the cafeteria in different stages of decomposition. Heading into the cafeteria, students peruse the garden bar, eating lettuce and carrots grown in the garden. At the center of each lunch table is a "share bowl" where students can place unwanted fruit and pre-packaged foods to share with others at their table. At the end of the lunch period, students sort their waste into three different bins-- compost, recycling, and landfill, each labeled with colorful signs. Everything left in the share bowls travels down to the FCS classroom where it is transformed into banana muffins or fruit jam. Each Monday, several students stay afterschool to help run a vegetable stand, that features produce from the neraby university farm. Parents and teachers stop by to buy vegetables, which are offered at half price to SNAP eligible families.

A core group of HMS teachers and staff who call themselves the "sustainability squad," help to run and coordinate the FTS program. The 'squad' (as they will be called in this paper) consists of the FCS teacher, AS teacher, school principal, AmeriCorps VISTA, and recently, a

district-level Middle School Garden Coordinator. They came to work together through their shared interest for gardening and reducing waste in the school.

The FTS program is also supported through strong partnerships. The nearby large land grant university supports the program through its Public Service and Outreach division, hosting an AmeriCorps VISTA who manages many aspects of FTS at HMS. Recently, due to the success of the program at HMS, a Middle School Garden Coordinator position was created through a three-way financial partnership from the university, Cooperative Extension, and Rivertown school district. This position now oversees FTS programs and an AmeriCorps VISTA at each of the four public middle schools in Rivertown.

Research Design and Methods

At the beginning of the 2014-2015 school year, we worked in collaboration with the squad to identify mutual research goals around understanding the FTS program. Our preliminary interests included understanding how students think about civic engagement, sustainability, and healthy eating. We designed a mixed methods study to reflect these goals. In this preliminary phase, we also received approval from the Rivertown School District to conduct this research and completed the necessary UGA IRB review of our research design. Beginning in the 2015-2016 school year and continuing through the summer of 2016, we conducted our research. Our protocol included 73 hours of participant observation of FTS activities, a 6th grade student baseline survey, interviews and focus groups with students, as well as interviews with administrators, teachers, and staff (see Figure 1.1). In this paper, we will primarily draw from our student interviews and participant observation.

Student Interviews

We invited 25 6th grade students to participate in semi-structured interviews. We drew upon baseline survey results to select students with a diversity of previous gardening experience, environmental attitudes, race/ethnicity, and elementary school attended. Fifteen students (60%) consented to participate in the interviews (see Table 1.1 for demographics). These interviews were conducted by JJT, JHJ, and AB. Each researcher interviewed the same set of students three times throughout the year in order to build rapport. One student left during the course of the school year, so she only completed the first two interviews.

The objective of our interviews was to characterize students' thinking about healthy eating. What messages had they absorbed from programming? Where did they locate responsibility for healthy eating? And what potential solutions did they come up with? In light of the critiques of FTS, we were interested in how much emphasis students placed on personal responsibility for healthy eating, and the extent to which they were able to identify larger, structural influences. Since we interviewed students three times throughout the school year, we were able to first characterize students' baseline knowledge and thinking. Then, as the school year progressed, we were able to examine how their thinking changed and how their experience with FTS influenced their thinking. Our interview protocol changed slightly as we progressed through the three sets of interviews to reflect the emerging research front. We also incorporated more questions to build stronger rapport and trust with students (see Appendix A to see our interview protocol).

Participant Observation

Participant observation of FTS activities consisted of ongoing data collection sessions throughout 2015-2016 school year and 2016 summer programming. The purpose of this was to observe FTS activities at HMS and how students, staff, and teachers interact with these activities. During the observation period, AB conducted 73 hours of observation (see Table 1.2), which included observing students and teachers in the garden, cooking labs, lunchroom composting, and summer program. Some guiding questions include: what types of activities are students participating in when they are in the garden and cafeteria? How do they react to these activities? What messages are teachers conveying?

Qualitative Analysis of Interviews

All student interviews were audio-recorded and transcribed verbatim. We analyzed transcripts using an iterative, inductive and deductive approach, known as coding, to identify and index key analytical categories related to our research questions (Miles and Huberman 1994; Saldana 2016). Coding is a process by which researchers identify themes in the data, and assign these themes with words or short phrases (Saldana 2016). Analysis was aided through the use of Atlas.ti (Scientific Software Development GmbH. 2012).

We began the coding process with each researcher independently reading the transcripts and identifying themes as they arose from the data itself. This process is known as "initial" coding (Saldana 2016, p. 115). We identified themes that were prevalent and noteworthy across the student interview data. During this process we found it helpful to think separately about how students first identify the 'problem' of healthy eating and then how they talk about 'solutions' for

healthy eating. This is how we have organized the results sections below. After initial coding, we then conducted a secondary coding process where we applied codes that were informed by Westheimer and Kahne's (2004) and Galt et al.'s (2013) civic mindset frameworks help inform how we categorized student solutions for improving healthy eating. These categories were not sufficient, however, and we added themes from the student interviews (such as education-based solutions) to reflect the data. This process, where researchers apply a predetermined list of codes informed by literature review, is known as "provisional" coding (Saldana 2016 p. 168). While applying this framework, we also paid close attention to how students' diverse lived experiences shape their civic mindset around healthy eating. Themes arising from the coding process were later cross-verified with an outside qualitative researcher. All discrepancies in coding were discussed to consensus.

Results

Student Understanding of Healthy Eating

In the results below, we organize our results into five major categories that are based on how students' answers our interview question, "why do you think some people don't eat healthy food all the time?" We refer to students' answers to this question as the "problem" of healthy eating. We then discuss the solutions students in each group identify when they answer the question, "based on what you just said, what do you think can be done about that?" See Figure 3.1 for a schematic map of how we have organized our data and results section. We draw on responses across all three interview sets when presenting these themes, but follow with a discussion of the shifts that were apparent between interviews one to three.

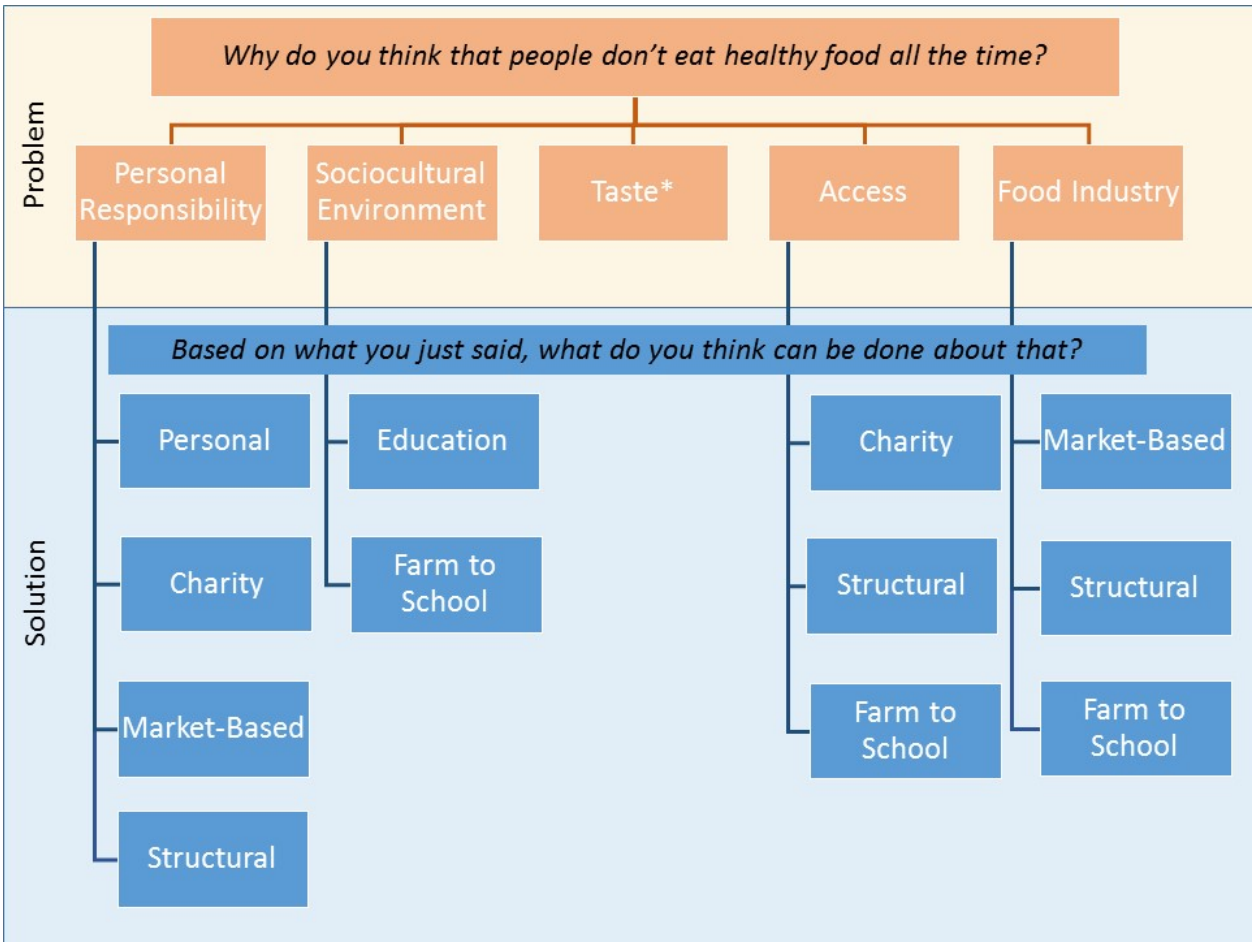


Figure 3.1: Schematic diagram of results. We organize our results section based on the five major themes we identify in how interviewees talk about the problem of healthy eating. We then characterize how interviewees talk about solutions for improving healthy eating within each of these sections.

Table 3.1: How students identify the "problem" of healthy eating

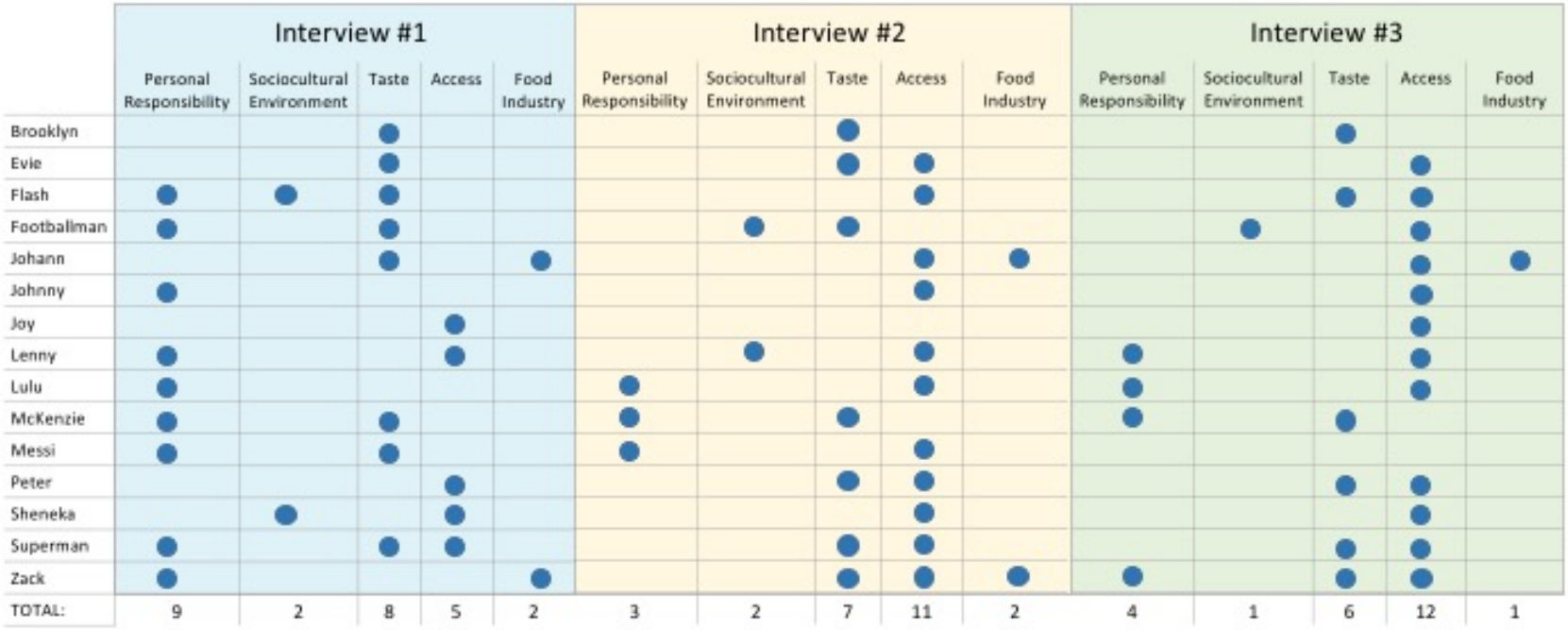
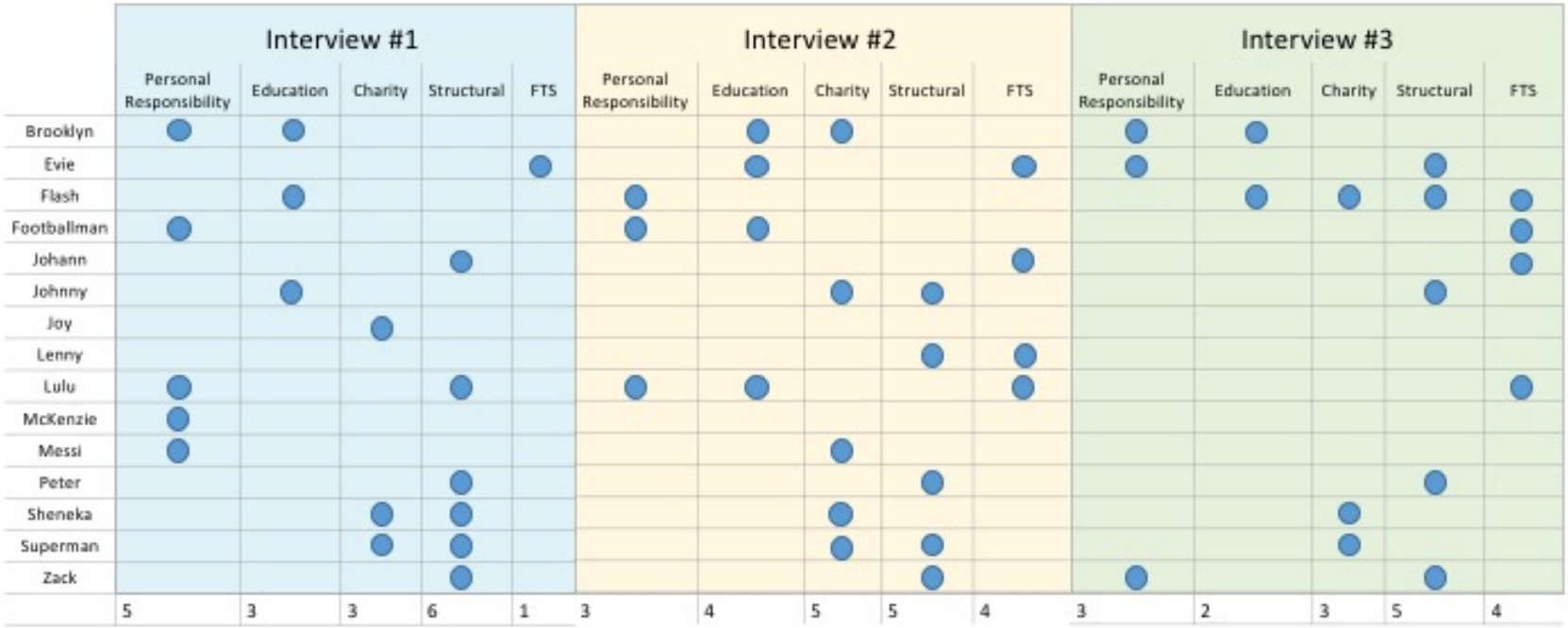


Table 3.2: How students identify "solutions" to healthy eating



Problem as Taste

Unsurprisingly, most students who we interviewed recognize that taste influences food choice. Many students expressed the attitude that healthy food doesn't taste good, and therefore people tend to choose less healthy options because they taste better. For example, Evie demonstrates this idea when she says,

> I don't think all healthy food tastes as good as junk food does, because it has all of those artificial flavors… Compare an apple or cookie, most people would pick a cookie because it tastes better than an apple.

This is not a surprising sentiment coming from 6th graders, and it was a prevalent theme among most students. In some cases, students discussed taste in conjunction with other ways of thinking about the problem. For example, Superman identifies both structural influences on food choice as well as taste.

> Cause they don't think it tastes good [or they are] not able to get to a store…Maybe if you're poor, you don't have a car or something and you can't get to a store and it's farther out.

Other students also discuss how some food corporations take advantage of taste at the cost of health in order to maximize profit. For example, Peter states,

> The mass-producing companies just don't really care too much about what the put into it. Just that it tastes good, and that they can make lots of it for really cheap.

Since taste was such a widely discussed challenge, students offered a wide range of possible solutions associated with taste, and they will not be discussed here, since they are addressed in each of the other sections.

Problem as Personal Responsibility

Many students identified a lack of personal responsibility as a major reason why some people do not engage in healthy eating practices. Students who identified this problem of healthy eating, mainly indexed personal choice as a driving factors. Lulu exemplifies how students talk about personal responsibility in her interview. For example, when asked why people don't eat healthy food she says, "Because they're lazy. Because they don't care what they're eating. They just want to eat the fat stuff [and] they don't want to listen to their doctors." This quotation demonstrates how personal responsibility mindset can sometimes lead to blame.

Johnny's interview provides a typical example of how students talk about personal choice. He says, "I kind of think it's just that idea of having a burger rather than having Brussel sprouts." Students who identified personal responsibility as the problem, mainly without demonstrating an understanding of the underlying structural causes (such as transportation and affordability) that influence how we make food related choices.

When students in this group identified personal responsibility as the primary issue that drives unhealthy eating, they in turn identified solutions that were also more personally framed. Among these solutions, dieting and education were the most often discussed. Mackenzie exemplifies

how students talk about dieting when she says, “They can get on a fast or diet. Maybe go jogging to lose some weight.” When students discussed education, they talked about learning about healthy eating from different sources such as TV commercials, parents, and doctors. For example, Johnny says,

> Well sometimes TV commercials will have like talking about how… you should always eat your vegetables. And your parents will tell you that you every day you should eat your fruits and vegetables.

To a much lesser extent, students who framed the problem as personal responsibility also raised both charitable and structural solutions. Among the charitable solutions, students suggested donating to or getting healthy foods from food pantries and soup kitchens. For example, Messi says, “Some people, [in] some communities and neighborhoods they give out bagged foods with vegetables in [them].”

As for structural solutions, Lulu mentioned petitioning the school to offer healthier options. Superman talked about building more grocery stores, and Zack talked about food corporations putting more healthy ingredients into prepared foods. Generally, however, students who framed healthy eating as a personal problem tended to frame the solution personally as well.

Only two students who framed the problem as one of personal responsibility discussed farm to school based solutions, Lulu and Zack. These solutions came during the third set of interviews. Lulu recommends, “It’s called a garden. You can go to a garden and grow your own crops.”

Even though Lulu mentions this solution, it is only after the interviewer presses her on the subject, asking for additional solutions after she offers a series of personally based solutions. Zack offers a different type of FTS-based solution, which is that of taste-testing produce from a garden. He says,

> You could take a carrot from the garden and then you could take carrots from a package, and try those if the garden [carrots] taste better…What you need to do is you need to have a garden, like right here, here's the cafeteria [**drawing a diagram with his hands**], you walk out there, you pick some fresh carrots, and you give them to the students.

Both Lulu and Zack's examples of FTS-based solutions reflect the type of programming that goes on at HMS.

Problem as Sociocultural Environment

The students we interviewed also describe how the socio-cultural environment influences what we eat, such as their family and community. Brooklyn exemplifies this way of identifying the problem when she says,

> [People don't eat healthy food] because they've never been exposed to that type of thing. If you've been living at a certain place for your entire life, you've never been exposed to other things outside of that.

This way of thinking goes beyond attributing personal responsibility for healthy eating by demonstrating an understanding that the surrounding sociocultural environment influences the choices people make. However, for the most part, these students fall short of describing larger societal structures that shape these environments. When students in this group identify socio-cultural environment as the problem, they then mainly index social learning and education-based solutions. For example, Footballman talks about social learning in the form of modeling behavior when he says

> [Eat healthy food] around them and make them act like they want to eat it too… Sometimes when I'm at my grandma's house, I didn't like broccoli, so she made me eat it and I kinda did like it.

A few students students who frame the problem as one of environmental influence discussed FTS-based solutions during their second and third interviews. For example, Footballman states that one solution would be, "Going to the people and having a produce sale." Similarly, Lenny offers an FTS-based solution when he says, "Maybe try to make the soil better so you can make the soil better for crops or to raise animals." Lenny and Footballman bring up these solutions in their second and third interviews respectively. Interestingly, both of these FTS-based solutions address changing the community environment, through increasing the availability of fresh produce (thereby increasing exposure), which directly speaks to the way in which they framed the problem to begin with.

Problem as Cost, Time, and Access

The students we interviewed also demonstrated an understanding of some the structural barriers that influence food choice. Notably, the number of students who indexed structural causes grew from five students at the beginning of the year to 12 at the end of the year. Students identified that the price of food, the time required to cook, and transportation all influence how people make food-based decisions. Of these structural barriers, students discuss the cost of food more than other barriers. Namely, they perceive that healthy food costs more than unhealthy alternatives. The Flash exemplifies this in his interview. When he is asked why more people don't eat healthy food, he simply says, "Because junk food is a lot cheaper than healthy food is." This was a common refrain among the majority of students we interviewed. Some students took this line of thinking a little bit further and discussed some of the underlying causes of *why* someone might not be able to afford healthy food. For example, Joy says,

> Probably because they can't afford to eat healthy, because their job doesn't pay them the best. They couldn't find a very high paying job. [Then] they might have to go [eat] fast food.

A few students recognized that a healthy diet can be time consuming, both in terms of grocery shopping as well as in terms of cooking. Evie demonstrates this thinking when she says,

> If you have to make baked chicken, it will take more time to make that. But then if you want chicken nuggets out of a bag that would take only thirty minutes to heat up in the oven.

To a lesser extent, some students discussed that a lack of transportation can influence how people eat. Superman demonstrates this theme when he says, “Maybe you don’t have a car or something, so you can’t drive to the store, you have to just walk to the nearest place.” In this quotation, Superman indexes food deserts/swamps when he implies that the majority of large grocery stores require a car to get to, and that more walkable options, such as corner stores, might not have as many healthy options.

Students who identified these structural influences on diet mainly cited charitable, structural, or FTS-based solutions. Superman exemplifies how students in this group talk about charitable solutions. He states that people can “donate healthy foods to charity” as one way to increase access to healthy food, specifically addressing the cost barrier. In terms of structural solutions, several students suggested government-based solutions. For example, after discussing how unhealthy foods are less expensive than healthy foods, as a solution Peter recommends that, “The government can put an import tax on unhealthy foods.” Similarly, other students mention “No Kid Left Hungry,” which we understood as a reference to the CEP and the Healthy, Hunger Free Kids Act of 2010 as another way that the government can support particularly kids in accessing healthy food.

Students in this group were the most likely to bring up FTS-based solutions. The most prevalent FTS solution was creating more farmers markets and produce stands. Students discussed starting farmers markets in different ways. For example, Johann says, “One thing that you could do is raise funds to build a farmers market in town… I guess the school could help raise funds and the towns could… collect taxes.” Johann’s example is more structural in nature, because he

describes how local organizations and government could collaborate to support this type of solution. Other students gave less detailed accounts of how you might go about organizing a farmers market or produce stand, but mentioned it as a solution nonetheless. Footballman exemplifies this when he recommends simply "Go to the people and have a produce sale."

Students in this group also mention growing a garden as a solution that would help people eat more healthy food. For example, Evie says, "I think that if you try to start growing your own vegetables and fruits then… maybe people will start eating healthier or maybe start their garden when they see how fun it looks." Students in this group draw on their FTS experience indexing farmers markets, produce stands, and growing a garden are all strategies that would potentially increase people's access to fresh fruits and vegetables, as a part of healthy diet.

Problem as Corporate Food Industry

Lastly, a few students identify the industrialized food system as the main reason why some people don't eat healthy food. This was not a very common theme, but a handful of students shared well-practiced, if imperfect, critiques of the food system. All students with this mindset began their 6th grade year with it already developed; no student developed a critical outlook of the food system over the course of the school year. Johann had the most practiced critique of the food system. For example, he says,

> Well you see, what the food industry does is it says "Hey buy this!" because it's so colorful and it tastes really good. Oreos aren't that colorful, but they're extremely tasty and sugary, so everyone wants to eat it.

Students who had this type of critical eye, mentioned viewing documentaries such as "Forks Over Knives" and "Fed Up" and talking about these issues with their family.

Students who frame the problem in this way mention corporate and FTS-based solutions. In terms of corporate-based solutions, Zack discusses food companies taking responsibility for the ingredients they use. He says, "Well, maybe like the same organizations that create those healthy bars. They're trying to make more people become healthy. And that's pretty much what should happen." On the other hand, although Johann still cites the responsibility as laying with corporations, he states that the solution lies with fairly compensating the cost of manufacturing food. He says, "Well pretty much [corporations] have to pay their manufacturers more, because their manufacturers just take food and they throw it together… They underpay the manufacturers."

Two students in this group suggested FTS-based solutions. As we discuss in the previous section, Johann suggests starting farmers markets. The other student. Lenny suggests an agriculture-based solution. He says, "Maybe try to make the soil better so you can grow crops or raise animals." Farmers' markets may be one potential solution that would address some of the corporate-based problems, since they cut out the middle man and are usually run by the farmers themselves. However, growing your own food or raising your own animals does not necessarily address corporate-based problems.

Discussion

The theme of personal responsibility was prevalent among most students the beginning of the school year. When these types of solutions "exist in isolation of other routes of action," it demonstrates that students have already embodied a neoliberal consciousness (Galt et al. 2013 p. 136). This focus on personal choice reifies existing social and market structures by defining citizenship primarily through the lens of consumerism. Assuming that anyone can simply "choose" to eat healthy turns a blind eye to the ways in which existing economic structures makes "choosing to eat healthy" more possible for some than others (Guthman 2008). For example, low wage jobs, the cheap pricing of commodity and convenience foods, and food deserts often lead to a prevalence of diet-related health conditions among low-income communities. The framework of personal responsibility is further problematic because it enables the blaming of people who experience these diet-related diseases, instead of recognizing our collective or state responsibility to address the underlying structural issues.

After a full year of FTS programming, more students identify structural barriers to healthy eating, than at the beginning of the year, specifically cost, access and time. This is important because it allows students to step away from the personal responsibility and blame, and begin to recognize that both the problem and solutions to these issues go beyond individual diligence in "making good decisions."

Many students drew upon their FTS experience to frame structural responses to the problem of healthy eating, such as Lulu. Lulu exemplifies how some students directly connect experience with the FTS program with identifying structural issues that influence healthy eating. When she

talks about the FTS program is the only time that she discusses nutrition in terms of food access. She says,

> Because the community around us goes to the produce sale, spends like a few bucks on stuff that's really cheap, a dollar or two… Because, you still want to be healthy, but if you don't have enough money to buy the nutritious stuff, which is really expensive, then you can just buy some really good stuff and make it yourself, it's better for you and it's cheaper at the same time.

Through their participation in FTS, Lulu and other students are developing an understanding of the food system in a way that enables them to recognize the economic barriers that some people face in securing nutritious foods. This is a positive step in that the FTS program has unveiled for some students the structural barriers that influence food choice.

Secondly, after participating in a full year of the FTS program, students are more likely to reference agriculture-related solutions to improving healthy eating. Students mention growing gardens and starting produce stands or farmers market as options for helping more people eat healthy food. However, there is still work to be done in terms of students better understanding a collective mindset to solve these problems. On one hand, students who cited access as the main problem affecting healthy eating were the most likely to cite FTS-based solutions. However, these solutions didn't always address the underlying issues of access. For example, some students referenced starting farmers markets or produce stands as a way to improve access, without awareness that the cost and location of produce at farmers markets can sometimes be prohibitive. Therefore, the outcome of more students citing these solutions is not entirely clear.

Here is where the critical lens perhaps becomes useful. If our goal as researchers is to challenge FTS programs to become more attuned to addressing the underlying societal barriers that influence health eating, then the agricultural solutions that students must address issues of access: cost, transportation, and time.

Conclusion

Childhood nutrition is an important community issue for promoting health and learning among students (Berezowitz et al. 2015). Many nutrition education programs focus on personal responsibility as a route for engaging children in healthy eating, which is problematic because it does not address the complex societal issues that determine health (Kimura et al. 2014; Guthman 2008). FTS may provide a pathway for engaging middle school students around the social and structural constraints that influence nutrition and health. Our research demonstrates that middle school students can draw on their FTS experiences to identify the structural issues that determine health and in some cases, reference community based solutions by the end of one year. This is an important step in the work for food system sustainability, and more work needs to be done to ensure that the structural barriers to health and collective solutions a central focus of FTS education.

CHAPTER 4

MIDDLE SCHOOL PERCEPTIONS OF SUSTAINABILITY IN FARM TO SCHOOL

Introduction

Farm to school (FTS) is an educational movement reaching 42% of all K-12 schools across the United States with a goal to educate students about sustainable food systems (USDA 2015). FTS teaches food systems education through experiential learning, including activities such as procuring locally grown fruits and vegetables in school cafeterias, planting school gardens, and related educational activities (Joshi, Henderson, Ratcliffe, and Feenstra 2014). This movement has been promoted due to a plethora of potential benefits that are seen as beneficial for increased food system sustainability (Berezowitz et al. 2015; Joshi et al. 2014). Since FTS takes a multi-faceted approach to food systems education, its potential benefits have been linked to multiple parts of the food system. Our research takes place at Hickory Middle School (HMS), an economically and racially diverse middle school in Rivertown with a robust FTS program centered on its large school garden. The FTS program is run by a group of teachers and staff who call themselves the "Sustainability Squad." Broadly, our objectives in this research project have been to characterize student and teacher experiences in their FTS program. This chapter will specifically focus on how students think about sustainability in light of their experiences with FTS, since it is the guiding principle of the FTS program at HMS. We begin by reviewing definitions of sustainability, student perceptions of sustainability, and how these are reflected in FTS program goals and outcomes.

Sustainability

In the face of climate change, environmental degradation and a growing human population, the idea of sustainable development (or just *sustainability*) has come to the forefront of research and public attention (WCED 2016). The origins of this idea trace back to the Bruntland Commission report (WCED 1987) when the UN convened to address global environmental concerns resulting from human population growth and economic development. Despite the ubiquity of this concept in research, policy, and popular media, a common definition of sustainability is elusive. The most widely cited definition is from the Bruntland Commission report, and it is perhaps purposefully vague. It states, "humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, in Kates, Parris, and Leiserowitz 2005).

Most interpretations of sustainable development ultimately consider a three-pillar model that includes environmental, social, and economic components (WCED 1987; Gustafson et al., 2016; King et al., 2012). Interpretations of the environmental pillar considers vary slightly but all concern preserving biodiversity and ecosystem function in order to conserve the natural resources that are necessary for life (Kates et al. 2005). The economic and social pillars vary more widely in their interpretation. The Bruntland report states that sustainable international economic exchanges are equitable for the parties involved and based in ecological integrity (WCED 1987). However, views of how to achieve these goals are the subject of much debate ranging from free market solutions to more cooperative-minded systems (Meadows et al 1972; Herman 1992; Heal 2009). Social sustainability promotes the ideals of equity, education, health,

culture, and social justice (WCED 1987; Kates et al. 2005)—in essence, creating the societal conditions necessary for individuals and communities to flourish.

These three pillars intersect in numerous, complex ways and ideally a sustainable community improves each area without neglecting another. For example, the Bruntland report notes that "a number of factors affect the connection between environmental stress, poverty, and security, such as inadequate development policies, adverse trends in the international economy, inequities in multi-racial and multi-ethnic societies, and pressures of population growth" (WCED 1987, p. 240). Therefore while, it is useful to tease apart social, environmental, and economic components of sustainability, it is equally important to consider the complex ways in which they interact.

Student Knowledge of Sustainability

Students today are growing up in an era increasingly known as the Anthropocene, where human impact is known to be the major driving force in the future of planetary health (Green 2017). Subsequently, 'sustainability' has become a buzzword in classrooms, media, and even the grocery store. Despite this, little is known on how students actually think about the idea of sustainability (Horton et al. 2013).

A small amount of research has been done to investigate how students think about environmental sustainability. One qualitative study conducted in Australia (Green 2017) demonstrates that upper elementary and middle school age students demonstrate caring about the greater 'web of life' when describing the need for a sustainable future. This study also demonstrates that students draw on school experiences such as school gardens in how they build this knowledge. These

findings are corroborated by other studies which find that students participating in school garden programs demonstrate increased environmental attitudes (Skelly and Zajicek 1998; Fisher-Maltese 2016; Aguilar, Waliczek, and Zajicek 2008)

Far less is known in terms of how students think about the social and economic components of sustainability. While university-level courses occassionally focus on the social and economic pillars of sustainability (Westerman, Westerman, and Whitaker 2016; Meek and Tarlau 2016; Guthman 2008), to our knowledge, there is no literature that demonstrates student knowledge of these topics in K-12 education. Plenty of social studies and economics classes or after school programs may indeed cover material related to these pillars, but do not appear to explicitly frame them in terms of larger sustainability goals.

There is no literature to date demonstrating what students learn about social or economic sustainability when they participate in FTS programs either. Nevertheless, FTS programs have been critiqued in the literature as working against social and economic sustainability. These critiques charge that FTS focuses too much on outcomes such as improving standardized test scores, obtaining normative body sizes, and educating about 'healthy choices' rather than discussing structural food systems issues issues such as poverty and transportation (Allen and Guthman 2006). Meek and Tarlau (2016) echo these concerns and warn that FTS programs that focus on objectives such as "learning 'sustainable' gardening techniques" are a "depoliticized" form of food systems education that distract from addressing the real harms of economic inequality (p. 239).

These social critiques are valuable for pushing FTS to consider its social implications. It is therefore necessary to ground these critiques in data, which is in part the motivation for our research. By examining what students engaged in FTS programs think about each of the pillars of sustainability, we will be able to understand how we can improve FTS activities to better reflect holistic sustainability goals.

Results and Discussion

The results presented below are based on our student focus group discussions around sustainability. The methods for this study are described in Chapter 1. The students in our study engaged in lively conversations where they discussed the concept of sustainability based on a brainstorming activity. Students first responded individually to the prompt "Please list words that you think of when you hear the word 'sustainability.'" Students jotted down lists of words on sticky notes, which they placed up on a board. Then, AB read off the words to the whole group, and engaged them in conversations around the ideas that they listed. In our analysis, we organized students' ideas into four main categories: environmental, social, and economic sustainability, and responsibility. These categories are defined and summarized in Table 4.1, and discussed in the sections below. To be clear, the focus groups themselves did not make organize their responses into these categories. All student names used below are pseudonyms which the students picked for themselves.

Table 4.1: Schematic diagram of student focus group data

Major Student Theme	Definition	Main Student Outcomes	Example Quotation
Environmental	Processes that preserve biodiversity, natural resources and ecological function	Conservation behaviors	"We're reusing water so that we can have clean water in the future." - Queen J
		Agriculture	"Compost, it breaks down stuff to make it more useful in dirt fo the plants and the trees." - Spongebob
Social	Social structures that promote equity, social justice, education, health, and cultural diversity	Diversity	"If you have people from different cultures and they all have ideas for a garden, then one person might have one idea, and one person might have nother. If you have a more diverse garden, you have more choices and you can find out about other people's cultures." – Dr. Cream Puff
Economic	Capital exchanges that promote equity and are based in ecological integrity	Green Jobs	"If there's new green power and people have stock in oil or something, it could trigger the economy. But overall, it's going to be better … for the future so that we don't have to mine natural resources [that] are going to run out eventually." – Wanye Kest
Responsibility	Being accountable for something within one's power	Responsibility for the future	"We should be responsible and make things last." – Mr. Crabs

How students think about environmental sustainability

Environmental sustainability was the most commonly cited concept among students' brainstorming and discussion of 'sustainability.' The words students identified when participating in the brainstorm portion of the focus group fell into three main sub-categories, agriculture, nature, and conservation-based behaviors. When students indexed agriculture-related concepts they listed concepts such as *animals, garden, compost, tractor,* and *growing crops*. The words they identified that were related to nature included, *parks, green, plants, trees, ecosystem,*

and natural resources. Lastly, when students discussed conservation-minded behaviors, they listed, *river clean-up, reduce, reuse, recycle, carbon foot print,* and *grow trees*.

When students then discussed these concepts further within the discussion portion, they mostly indexed conservation-based behaviors. Queen J's quotation exemplifies this type of discussion. She says, "We're reusing water so that we can have clean water in the future." In a similar vein, Dr. Cream Puff talks about waste reduction, saying "we should reduce Styrofoam and recycle more aluminum cans. A lot of people throw away Coca Cola cans, and it needs to be recycled." To a lesser extent, students also discussed specific agricultural practices. For example, Spongebob says, "Compost, it breaks down stuff to make it more useful in dirt for the plants and trees." The agriculture and conservation-based behaviors that students discuss in their focus groups are reflected in the day-to-day reality of the sustainability program at HMS. Working in the school garden and lunchroom waste reduction program are the parts of the program that students at HMS engage with each day. Therefore, it is unsurprising that these aspects constitute a large part of the focus group discussion.

How students think of Social Sustainability:

Students in our focus groups also engaged in discussions around social sustainability, but to a lesser extent than the environmental pillar. During the brainstorm activity, students listed a few key concepts that related to social sustainability: *service, health, learning, community, family, culture, holidays, working together, making friends, languages, diversity,* and *less bullying*

AB then prompted students to specifically elaborate on some of these social themes, which led to in depth discussions. For example, two students discuss what they see as the connection between diversity and sustainability:

> WANYE KEST: I think that diversity is sustainability because people can make friends when they're doing sustainable things. And even if they're different from each other, then they can still make friends and even if one of them speaks another language, you don't really have to talk to each other when you're doing work. You can just like sort of work together.
>
> WHAT-ARE-THOSE: Diversity and sustainability come together in Ag [Science class]. Like different people come together and sometimes it's fun out there, you can just like make jokes when you're working.

This quotation led to a lively discussion among students in which they talked at length about working in the garden allowed for them to build relationships across difference.

Later in the same focus group, Dr. Cream Puff explained how he thought biodiversity in the garden and the diversity of students in the school, were related to sustainability. He says,

> Well, if you have… people from different cultures and they all have ideas for a garden, then one person might have one idea, and one person might have another. If you have a more diverse garden, you have more choices and you can find out about other people's cultures. So it's a great way for others to learn new cultures. And it's a good way for people to sustain cultures.

These examples demonstrate how students are specifically drawing on their experience in FTS when they think about social sustainability. They identify that the nature of the work in the

garden and other FTS activities, which is collaborative and physical, allows for social interaction and relationship-building. This type of collective and social work is referred to as affective labor and is an organizing force that allows people to create meaningful social networks (Hardt 1999; Singh 2013; Laaksoharju et al 2012).

How students think about economic sustainability:

Economic sustainability was a minor theme among student discussions. The only economic-related word that students brainstormed as a part of the first activity was *businesses*. Larger discussion around economic sustainability was only a prominent part of one focus group, however, the discussion was quite lively and contentious. It was also the only example of debate that occurred during any of the focus groups. This discussion began when one student brought up the concept of green energy. Wanye Kest said,

> The way we can do this is by innovating and having new technologies… Even though these new things scare some people, like if there's a new green power and people have stock in oil or something, it could trigger the economy. But overall, it's going to be better … for the future so that we don't have to mine natural resources [that] are going to run out eventually.

Another student, Grandma, disagreed and continued the conversation:

> Well, I would have to disagree with what [Wanye Kest] just said because actually if you have technology doing everything people won't know how to do it and jobs that people normally have will become obsolete.

From there, the discussion continued, with other students joining in and debating the merits and drawbacks of green technology and how it would affect job availability and workers' livelihoods.

Interestingly, the two sides of this debate fell along racial and gendered lines. The students who were advocating for green energy and technology were white, male students. The students who were concerned that this would lead to a lack of jobs were Black, female students. This reflects the racial and class divisions within Rivertown, where our study takes place. The white population is largely affluent, while the Black population is largely lower income. This debate seemed to reflect a microcosm of the economic situation students face within the community.

Responsibility:

Woven throughout their discussions of the three different pillars was an under-girding theme of responsibility to the future. Students wrote and discussed sustainability in general terms and touched on themes relating both to personal and collective responsibility. For example, Mr Crabs says, "We should be responsible and make things last." Many students either wrote or discussed themes related to this general and abstract notion of sustainability and responsibility.

In addition, one of the groups got involved in a lengthy conversation about responsibility as it specifically pertains to their school-wide composting program. Students were upset that some of their peers do not sort their lunch waste appropriately, even though signs are clearly labeled. As Queen J exclaimed, "I'm not going to say any names, but they like, this girl, she put her plastic into the trash can for some reason." The group then went on to debate the different types of systems that could be put in place for attempting to better enforce waste sorting. Cricket for example says, "We might be able to have monitors around the bin." Following was an in depth discussion of positive versus negative enforcement. This conversation was an interesting

microcosm of the ways in which this plays out in society at large, particularly around waste reduction.

To a lesser extent, but an important point nonetheless, students also talked about the role of government in regulating sustainable behaviors. For example, Spongebob says, "There are people that work at the recycling [center], it's kind of hooked up with the government, and they try to help schools and people recycle and compost."

Conclusion:

The challenges facing our global and local food systems depend on complex, systems' thinking. The pressures of feeding a growing population in the face of climate change engages understanding of nutrition, ecosystem stability, food affordability, sociocultural well-being, resilience, food safety, and food waste (Gustafson et al 2016). As FTS programs aim to nurture students' understanding of these complexities, characterizing the ways students think about sustainability is one step in understanding the impact of these programs. It is also potentially an important first step to gauge how we are preparing the next generation to deal with this issue in the future. This case study at HMS paints the picture of student understanding after one year of FTS program that is integrated throughout school work and the cafeteria.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

The social critiques of FTS have stimulated an important discussion about the role and purpose of this popular education movement. These critiques argue that FTS is depoliticized, does not address the structural causes of food insecurity such as poverty and food access, and focuses too much on solutions that promote personal responsibility for health (Allen and Guthman 2006; Meek and Tarlau 2016). To date, there are few studies that examine these critiques in the context of actual FTS programming. This thesis presents the findings of our mixed-methods case study at HMS, grounding the critique in the social and environmental outcomes of the program. In this way, our research is an example of a critical instance case study, providing a data-rich counter-example that calls into question the overly generalized critiques of FTS.

Summary of Findings

In chapter two, our data demonstrate that the FTS program at HMS creates a space for collective responsibility and collaborative learning within the school. Through gardening and cooking activities, FTS offers an increased opportunity for students to work together toward a shared goal. These program characteristics promote students forming relationships across difference and experiencing collaborative, as opposed to individual, success. Similar findings are echoed by other case studies (Ohly et al. 2016; Cutter-Mckenzie 2009; Ahmed et al. 2011), demonstrating that FTS can be a powerful tool for promoting collective responsibility and collaborative-

learning. This finding counters the critique that FTS only promotes personal responsibility for health.

The student interview data presented in chapter three illustrates that students index their experiences with the FTS program when they identify structural barriers to healthy eating such as cost, access, and time. The data in this chapter also demonstrates that more students are able to identify these barriers as they participate in the FTS program. This finding speaks directly to the critique that FTS is inherently depoliticized because our data demonstrate that the structural nature of food insecurity is made more clear by participating in the program. Furthermore, students drew on their FTS experience when identifying potential solutions for healthy eating, such as starting a produce stand. Although these FTS-based solutions can be interpreted as drawing on neoliberal ideologies of individual responsibility and consumerism, our participant observation indicates that students' experience with FTS is collective so they identify these solutions with a collective action frame. These findings provide the basis for further studies to identify which components of the HMS program are producing learning outcomes focused on structural inequality as the underlying causes of food insecurity. This will support efforts to replicate and expand student outcomes at other sites.

The focus group data presented in chapter four demonstrates how FTS can be a platform for exploring the themes of sustainability. While students mainly reference environmental concepts, they also discuss topics related to the social and economic pillars. This again provides a counter-example to the critique of FTS because it again demonstrates that students at HMS were able to

draw on their experiences in FTS when discussing economic and social components of sustainability. Some of these components included job security and cultural preservation.

Taken as a whole the data presented in this thesis clearly demonstrates that some of the generalized critiques of FTS are overdrawn. However, it is important to note that this does not mean that FTS is a panacea for all community health related issues or that there are not limitations to the programming. The HMS case study clearly illustrates some specific limitations of FTS-based solutions. For one, even though participating students were better able to identify structural causes of food insecurity, FTS-based solutions don't always address the underlying issues of access. For example, the afterschool garden market offers produce at half price for SNAP recipients, however, the majority of those who shop at the stand are middle class or affluent families. Furthermore, students commonly offered "grow your own food" as a solution for increasing access to healthy food. While we do not necessarily know the larger context for what students mean here, this type of solution does not necessarily address some of the underlying structural issues, such as land access or time, that people face in producing their own food. Therefore, we must continue to challenge FTS programs to become more attuned to addressing the underlying societal barriers that influence community health and agriculture.

Limitations of the study

One of the major opportunities being involved with this research project is that my husband was the middle school garden coordinator. This offered unprecedented access to and detailed knowledge of the inner-workings of the research site. However, my perspective of the situation while greatly enhanced by this connection, is also perhaps limited due to preconceived ideas

about the program. I could see that in future work at HMS or other middle schools in Rivertown how it would be valuable to have another researcher conducting some of the participant observation. This potential bias was mitigated, but not entirely eliminated, by working with other researchers, such as Dr. Jennifer Jo Thompson and Dr. Jenn Hauver, as well as other undergraduate and graduate researchers, who reviewed, interrogated, and corroborated my analysis. Working closely with these collaborators kept me true to the data.

Other limitations of this research project include not having conducted a follow up survey of the sixth grade class. This would have allowed us to further investigate how students' knowledge and perceptions changed as they completed one year of the FTS program. In a similar vein, following up with another set of student interviews and focus groups (when our sample population was in the seventh and eighth grades) would have also provided valuable comparison data.

Future research direction and opportunities

The data presented in this thesis comprises a one-year mixed-methods critical instance case study that illustrates some opportunities for further research to understand what specific components contribute to particular outcomes. One possibility would be to start a new set of student interviews with sixth grade students and follow them through their seventh and eighth grade years. This would allow us to see how student perceptions of healthy eating change beyond their first year of FTS. A similar approach could be applied for student focus groups, in order to see how their knowledge and perceptions of sustainability change over time. Furthermore, since the start of this program, three more middle schools have developed their own FTS programs in

Rivertown with one program about to start in a neighboring county. Following a similar research protocol at other schools would present a whole host of opportunities for comparison across case studies. For example, to what the extent does administrative support affect the success of programming? How do teachers' interest and focus change the scope of the programming? Do differing student demographics affect how students interpret the messaging of FTS programs?

Closing thoughts

FTS is a popular educational movement that receives much praise for its work at the intersection of student nutrition and sustainable food systems. Through these programs, students participate in experiential learning activities that promote fruit and vegetable consumption and agricultural knowledge. At the same time, important critiques of these programs question whether FTS programs do enough to educate about and address the underlying causes of food insecurity such as economic inequality. This thesis demonstrates that there are some powerful ways in which FTS allows for students to engage in collective responsibility for health and waste reduction and also promotes learning about some of the structural barriers to healthy eating.

It is also abundantly clear that even though we were able to demonstrate these positive outcomes through FTS, the educational messages about the damaging nature of economic inequality are not made explicit enough. Our teacher interview data, which was used only minimally in this thesis illustrates a telling point: *teachers and staff are keenly aware of the challenges created by economic inequality in their students lives. And they seem unsure of how talk about it or address it with their students.* In contrast, students showed us that they were fairly unfettered in talking about the benefits of the community eligibility provision for free lunch or debating whether

robots are taking away jobs at the local grocery store. Let's have this be an invitation to figure out how to better support teachers and administrators to be able to dig in deeper into these issues in the classroom and cafeteria through FTS.

We have been able to catch a brief glimpse of what this type of support might look like. We have been involved for the past two years in working with teacher support groups for FTS. We ran one session where we introduced HMS teachers to the idea of the three pillars to sustainability. The teachers involved in this session seemed to be surprised and excited to learn about the economic and social themes that were related to environmental messaging which they were already familiar with. It is important to not only provide more support for teachers to not only be familiar with this concept, but also with the tools on how to confidently engage students around these concepts. This is one direction that could allow more teachers to engage with FTS in ways that illuminates the social and economic dynamics that impact community health around food.

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APPENDIX A: Student Interview Protocol Fall 2015

"Understanding the impact of integrated sustainability programming in middle school"

Civic Literacy component

Interview Questions:

Critical knowing (defined here as deep understanding of issues facing the community)

- Where does the food you eat come from?
- How do you decide what to eat?
- What makes some foods 'healthy'?
- Why do you think that some people don't eat healthy foods? (Why doesn't everyone eat healthy food?)
- What might get in the way of people eating healthy foods?

Social responsibility (defined here as a feeling of responsibility to and for self/others in the community). Based on students' answers to the first set of questions, ask:

- Given what you've said about why people may not always eat healthy foods, what can be done about that?
- Who is responsible for making these changes?

Agency (defined here as a sense of efficacy in the face of the issues facing one's community)

- Is there anything you feel you can do? If so, what?
- How might you go about doing that?
- What might get in your way?

If/when gardening/cooking at school comes up, or at the end of the interview:

- How do you feel when you spend time in the garden or preparing food at school? (*Tell me a story…)*
- Have you learned anything in the school garden / kitchen that you might use at home or somewhere else in the future

APPENDIX B: Student Interview Protocol Winter/Spring 2016

"Understanding the impact of integrated sustainability programming in middle school"

Civic Literacy component

Reminder: There are no right/wrong answers.

Rapport Building Questions:

- Did you enjoy the holiday break?
- What was your favorite thing that you did during break?
- Tell me about a favorite holiday food that you eat/make with your family.
- *** If not asked last time: Tell me about your family. Who do you live with?

Interview Questions:

Critical knowing (defined here as deep understanding of issues facing the community)

- Where does the food you eat come from?
- On a typical school night (maybe last night), what does dinner look like? What do you eat?
- How do you decide what to eat?
- What makes some foods 'healthy'? (Inverse if needed: What makes some foods 'unhealthy'?)
- Why do you think that some people don't eat healthy foods? (Why doesn't everyone eat healthy food?)
- What might get in the way of people eating healthy foods?
    - **PROMPT:** *If I really wanted to eat something healthy, but I couldn't, what would be a reason why I couldn't?*

Social responsibility (defined here as a feeling of responsibility to and for self/others in the community). Based on students' answers to the first set of questions, ask:

- Given what you've said about why people may not always eat healthy foods, what can be done about that?
- Who is responsible for making these changes?
- Is this something you've talked about at home, or at school? Tell me about it.

Agency (defined here as a sense of efficacy in the face of the issues facing one's community)

- Is there anything you feel you can do? If so, what?
- How might you go about doing that?
- What might get in your way?

Reflecting on coursework

- Now that you've completed your FCS/Ag Science course…
- Tell me about a favorite project that you worked on in Ag/FCS. What was it specifically that you liked about it.
- What do you think were some big lessons you learned in that class?
- Do you think you'll use those lessons in your life outside of class? How?
- Was there anything you wish you'd done more of or less of in that class?
- How are you feeling about starting FCS/Ag Science now?

*** If service projects come up, prompt:

- What was the goal of this project?
- Who was it benefitting? and How?
- What did you get out of it?

If/when gardening/cooking at school comes up, or at the end of the interview:

- How do you feel when you spend time in the garden or preparing food at school? (*Tell me a story…)*
- Have you learned anything in the school garden / kitchen that you might use at home or somewhere else in the future?

*If **community** or **sustainability** come up:*

- What do you think makes a community healthy?
- Whose responsibility is it to make/keep a community healthy?
- Are there things that you think you can do?
- What might get in the way?
- What does sustainability mean?
- Who is responsible for working toward it?
- How can we do that?
- What might get in our way?

APPENDIX C: Focus Group Protocol

Introduction: (5 minutes)

- **Assent Process:** following protocol, verbally walk students through the assent form, and then have each student opt in or opt out. Answer any questions from students. Collect the forms. [If any students opt out, thank them and send back to class.]
- **Start audio-recorder**
- **Welcome:** Thank students for being a part of the focus group. Pass around snacks. Introduce self and notetaker. Explain that we are interested in learning about what students do/think both at home and school around issues of sustainability. We will be using this information to write a study/report, and it's a really neat opportunity to be involved in research. **"This is not a test. There are no right or wrong answers. We just want to know what is true for you."**
- **Introductions:** Go around the circle and have students give themselves a pseudonym (a fake name; this can be you 'alter ego' or a name you just like) that we will use for the rest of the study. Have students write down their pseudonym on a name tag, and wear it for the rest of the focus group.
- **Icebreaker Game:** Play a round of "Whoosh/Bang"—a game which encourages focus, clear communication, and teamwork.

Focus Group Sample Questions (7 min. each):

1. Have you heard of the term 'sustainability'? Where have you heard this (in what context)? What might it mean? Let's construct a group definition of sustainability. Give students some time to work by themselves to come up with their own personal ideas of sustainability. Then have students come up and post their ideas on a large piece of paper or white board. Have students comment/reflect on the similarities that they see, and the differences. What are the common themes? Come up with a 'working' definition of sustainability together.
    a. Who is responsible?
    b. When you say "we" who are you referring to?
    c. When you say "you" who are you refering to?

2. What are some things that you (might/could) do at school that are sustainable? (Repeat process of brainstorming)
    - Let students think, post activities, and then prompt if necessary: In the lunchroom? In [FCS/Ag Science/Sustainability Club or the Kitchen Garden Corps summer program]? Other places around school?
    - What kinds of things make doing these sustainability things hard? Or easy?
    - What might make it easier for you – or your friends – to do these things?

3. What are some activities that you do in your life at home -- by yourself, or with your friends and family that you would consider to be sustainable? (Repeat brainstorming process)

Conclusion: (3 minutes)

- Thank students for their contributions.
- At Fall group: We will do this again in the Spring
- Any additional questions?
- Send students back to class.

APPENDIX D: Staff Interview Protocol

In this interview we will ask you about the HMS garden and related "sustainability programming" at HMS. By this we mean… [garden, goats, chickens, lunchroom composting, afterschool programming, weekly produce sale, and summer programming].

1. What does sustainability mean to you? OR How do you think about sustainability?

2. What do you want the students to take away from the garden and other related activities?
    a. *Knowledge, skills, attitudes, behaviors (Prompt if needed)*

3. Is there a shared mission/goal/objective of the "Sustainability Squad"? If so, what is it?

4. How have you integrated the garden, composting, or other sustainability themes into your teaching? (OR: your work at HMS?)
    a. What is it that you want students to get out of these lessons?
    b. What do you think that students gain from these lessons?

5. What key challenges [to learning? To success?] do HMS students face?
    a. What do you think can/should be done to address/deal with these issues?
    b. Do you talk about these issues with your students/in your classes? Tell me about that.

6. In what ways – if at all -- do you think that the garden/sustainability programming addresses these key challenges?
    a. What are some of the impacts you've observed in students? Can you give me concrete example?
    b. Do you observe changes over the course of students' years at HMS? Tell me about that.

7. How do you think the garden/sustainability programming has affected the overall culture of HMS?

Address these additional themes if they come up:

Where would you like to see the sustainability program going in the next 3 years?

- What would it take to make this happen?

What differences – if any – have you observed in the lunchroom? Tell me about that.

- Have you talked with students about composting? What has this conversation looked like?

What impact – if any – do you think the garden/sustainability programming has had on the Rivertown community?

- [If service comes up]: Who benefits? In what ways?

What do parents (or community members) have to say about the garden/sustainability programming at HMS?

- Probe for positive & negative

APPENDIX E: Fall 2015 6th Grade Baseline Survey Results

Number of Participants = 158, 84% response rate

ENVIRONMENTAL BEHAVIORS:

- 51.0% report that they recycle at home 'a lot' or 'always'
- 68.4% report that they recycle at school 'a lot' or 'always'
- 31% of 6th graders compost at home 'a lot' or 'always'
- 80.4% of 6th graders compost at school 'a lot' or 'always'
- 48.4% report that they think 'a lot' or 'always' about how their actions affect nature

COMMUNITY MINDSET: (*these are the questions that Tom specifically recommended for the survey)*

- 74.4% 'strongly agree' or 'agree' think that every student should do something about school-wide problems
- 73.1% 'strongly agree' or 'agree' that they are committed to helping their community now and in the future
- 78.3% 'strongly agree' or 'agree' that they like helping other people when they are having problems
- 81.9% "strongly agree' or 'agree' that it makes them sad to see a person who doesn't have friends
- 84.6% 'strongly agree' or 'agree' that it is important to do what they think is right even if their friends make fun of them
- 58.7% 'strongly agree' or 'agree' that they think of past choices when making a new decision
- 64.7% 'strongly disagree' or 'disagree' that it does <u>not</u> matter if people change parts of the environment
- 82.7% 'strongly agree' or 'agree' that it is important to do their best even when they have a job that they do not like.

GARDEN-RELATED SCIENCE CONTENT:

- 88% identified organisms that made their food from the sun
- 67%-77% identified beneficial garden organisms
- 61% identified all of the benefits of composting
- 86% identified all of the abiotic factors a plant needs to grow
- 74% correctly identified the parts of a plant

PREVIOUS GARDENING EXPERIENCE:

- 48% report having a school garden in 5th grade
- 44% of those who report that they had a school garden in 5th grade report that their teacher used the garden
- 60% of 6th graders report that their parents or grandparents have a garden
- 43% report that a family member lives in the country or has a farm