The Fresh Fruit and Vegetable Program's Influence on the Home Food Environment and Shopping Practices

by

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A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Science

Approved November 2017 by the
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ARIZONA STATE UNIVERSITY

May 2018

ABSTRACT

Despite the literature suggesting that fruits and vegetables (F&V) can have a protective outcome against overweight, obesity and chronic diseases, consumption is still inadequate. In order to address under consumption of F&V among children, schools have become a platform for a variety of food programs. The Fresh Fruit and Vegetable Program (FFVP), a United States Department of Agriculture (USDA) initiative, aims to increase exposure and consumption of F&V in low-income school children by providing F&V snacks. Participation in FFVP has been associated with higher preference and consumption of F&V and research also suggests that the program has the potential to decrease rates of overweight and obesity. The benefits of this program have been found to extend outside of the school setting, with higher requests for F&V at home and at the grocery store. This study aims to explore how children's participation in the FFVP influences home food environments and shopping practices through qualitative analysis focus group data. Four focus groups were held with parents (n=25) from three FFVP participating schools. The data was analyzed using an inductive thematic analysis approach to find themes within the discussions. The findings were grouped into three categories: General Perceptions of FFVP, Impact of FFVP on the Home Food Environment, and Impact of FFVP on Shopping Practices. For General Perceptions of FFVP, themes were: Children learn about and enjoy F&V, awareness of farm to school programs, and children make healthier choices. Impact of FFVP on the Home Food Environment included the themes: Choosing heathier foods and snacks, parent F&V

behaviors, children request F&V at home, and children talk about or bring F&V home. Finally, Impact of FFVP on Shopping Practices included the themes: children's involvement in shopping, children request to buy F&V, children request non-produce items, and parents decline or limit unhealthy requests. This qualitative study provides valuable insights about how FFVP participation influences child and family behaviors towards F&V at home and in the grocery store. School food programs, such as the FFVP, have a positive influence on F&V related behaviors among children and should be continued and expanded.

DEDICATION

To my family for their love, help and encouragement in this journey. To my husband, Sergio, for patiently supporting my goals and aspirations; to our son, Aiden, who I hope will be inspired to follow his own dreams; to my supportive parents, Jose and Maria, whose bold decision to immigrate our family to this county opened up a world of opportunities for me; to my siblings, Rafael and Jasmyn, may you also be inspired to leave your mark on this world.

Also to my fellow DREAMers, for inspiring me with their unwavering passion for higher education; to my beautiful and strong sorority sisters, who continue to uphold our pillars of academic excellence, community service and sisterhood; and to my long-time mentors and friends Genie and Hector Zavaleta and Debbie and Dr. Allan Cameron, thank you for being an example and teaching me the value of education.

ACKNOWLEDGMENTS

I would like to sincerely thank my committee for their guidance in this process. To Dr. Punam Ohri-Vachaspati, who has challenged me in and outside of the classroom from day one; thank you for your kindness and support and for teaching me the value of research. Your love for public health and for helping underserved communities through research has inspired me greatly. To Dr. Robin DeWeese, for your support and for coming to the rescue when I needed it; your sense of humor made data analysis lighter and more enjoyable. To Dr. Jessie Gruner, your knowledge and guidance in qualitative data analysis has been invaluable; you are truly an example of taking the research and applying it to policy in the real world.

I would also like to thank my amazing family, friends and co-workers who have been my cheerleaders all along. Most importantly, I want to thank God for blessing me with the courage, strength and determination to reach this goal.

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INTRODUCTION

Studies tie eating fruits and vegetables (F&V) to better health outcomes and decreased risk of chronic disease, yet neither youth nor their parents are eating enough, and per-capita F&V consumption in Americans even declined by 7% between 2010-2014 ("State of Plate," 2015). Youth ages 2 through 18 increased their whole fruit intake by 67% between 2003-2010, yet 60% were still not meeting the daily recommendations for fruits, and 93% did not eat enough vegetables (Kim et al., 2014).

Research suggests that there are associations between inadequate intake of F&V and overweight, obesity and central adiposity. A cross-sectional study by Bradlee, Rinder, Qureshi and Moore (2009) used data from the Third National Health and Nutrition Examination Survey (NHANES III) to explore associations between food group intake and central obesity in children and adolescents. The results showed lower consumption of fruits and vegetables among adolescent boys with the highest central adiposity. Cook et al. (2014) examined the relationship between adiposity, liver fat, and insulin sensitivity and the consumption of nutrient-rich vegetables in overweight Latino youth and found that even small amounts of vegetable consumption had positive outcomes.

Lin & Mentzer-Morrison (2002) found an inverse association between eating fruits and BMI in youth subgroups (boys 8-10 years old and male and female adolescents 13 years and older). The relationship between vegetables and BMI was not

as strong. The same study also noted that overweight boys consumed fewer vegetables and all children in the study consumed significantly less fruit than their healthy weight counterparts.

These associations between adiposity and health risks are noteworthy in lieu of longitudinal research suggesting that obese adolescents remain obese as adults (Gordon-Larson, The & Adair, 2010). In a cohort of more than 15 million 13 to 20 year olds followed for a period of 12 years, 90% of those who were obese at the beginning of the study remained obese into their 30's. As obesity and resulting chronic diseases rise in youth and continue into adulthood, it is necessary to foster new and innovative ways to promote the consumption of F&V early on.

Youth spend a significant part of their day in schools and can consume two meals and snacks within the school setting, making schools a key setting for public health interventions to increase F&V. One avenue in which this happens is through school lunches. The National School Lunch Program (NSLP) served a total of 30.4 million students daily in over 100,000 schools pre-kindergarten to 12th grade in 2016 ("National School Lunch Program," 2017). Increasing F&V in schools can also go beyond participation in NSLP. Programs like the United States Department of Agriculture (USDA) Fresh Fruit and Vegetable Program (FFVP) help to put more F&V in children's diets. The FFVP aims to create a healthier food environment in schools by increasing variety and consumption of F&V. The program targets low-income schools where 50% or more of the student body receives free or reduced price meals. The FFVP became a national

program in 2008 with $40 million in funding ("USDA FFVP Fact Sheet," 2013). Funding has since reached $174.5 million in fiscal year 2018 (Smith-Holmes, 2017). The FFVP provides additional occasions for youth to try a variety of fruits and vegetables outside of breakfast and lunch programs, but the program also has had a positive influence on healthier food availability during lunch time. One study found that schools participating in the FFVP were significantly more likely to serve fruits during school meals (Ohri-Vachaspati, Turner & Chaloupka, 2012).

A study evaluating the impact of the FFVP on participating school children noted that children attending FFVP schools consumed about one-third cup more F&V on FFVP days compared to their counterparts (Bartlett et al., 2013). The effect appeared to be greater for fruits, with consumption being one-quarter of a cup more. Additionally, knowledge, perceptions, and familiarity of F&V were also consistently higher in FFVP participating students. Of particular importance to the present study, this study found a statistically significant increase in fresh F&V intake outside of school, pointing to the FFVP's potential to have a further reach beyond the school day. One study points to the possibility of the FFVP's extension into the home environment. The cross-sectional study concluded that participation in the FFVP was associated with children making more requests for F&V at the grocery store and increasing their self-efficacy to choose vegetables at home (Ohri-Vachaspati et al., 2018).

Statement of Purpose

The purpose of the present analysis is to explore, through qualitative analysis, how children attending FFVP participating schools influence home food environments and parents' grocery shopping practices.

Definition of Terms

BMI- Body Mass Index

F&V- Abbreviation for fruit(s) and vegetable(s)

FFVP- Fresh Fruit and Vegetable Program

FG- Focus Groups

NHANES- National Health and Nutrition Examination Survey

NSLP- National School Lunch Program

SBP- School Breakfast Program

SNAP-Ed- Supplemental Nutrition Assistance Program-Education

USDA- United States Department of Agriculture

WIC- Special Supplemental Nutrition Program for Women, Infants, and Children

CHAPTER 2

REVIEW OF LITERATURE

Benefits of Fruit and Vegetable Consumption

Public health efforts to curb the current obesity epidemic affecting our country are focused on increasing F&V consumption as a strategy to achieve this goal. Among many benefits of eating fruits and vegetables (F&V), researchers noted that a decrease in all-cause mortality was associated with consuming five or more F&V (Bellavia, Larsson, Bottai, Wolk & Orsini, 2013). By comparison, never consuming F&V can potentially decrease life expectancy by three years. Obesity carries with it an increased risk for other chronic disease such as type 2 diabetes, which is also on the rise. Research suggests that intake of two to three vegetables and two fruits a day can potentially decrease the risk for T2D (Wu, Zhang, Jiang & Jiang, 2014). A diet rich in plant-based foods, like F&V, is vital for health. In addition to key nutrients and antioxidants, bioactive phytochemicals found in F&V contribute to reducing chronic disease risk according to Liu (2013). Furthermore, different bioactive compounds are found in all F&V, thus consumption of a wide selection of F&V will provide the most health benefits.

Fruit and Vegetable Consumption Patterns in Youth and Adults

The Dietary Guidelines for Americans provide authoritative recommendations on diet and physical activity. The USDA and Department of Health and Human Services publishes the guidelines every five years with input from registered dietitians (Denny, 2016). The most recent 2015-2020 guidelines shifted from recommending individual

dietary and nutrient components from each food group to encouraging overall eating patterns, since people do not eat food groups in isolation (“Dietary Guidelines,” 2015). According to the guidelines, a healthy eating pattern includes a variety of colorful vegetables from all color groups including dark green, red, and orange, in addition to starchy vegetables and legumes. The recommendation for fruits is to consume them whole as well as in different forms such as fresh, canned and frozen or as 100% fruit juice. Average people following a 2,000-calorie daily diet are instructed to consume two and a half cup-equivalents per day of vegetables and two-cup-equivalents per day of fruits (“Dietary Guidelines,” 2015). Further implementation strategies are provided through the USDA’s ChooseMyPlate.Gov web resource, with recommendations for daily and weekly goals for F&V consumption by age and sex (“All about the Fruit Group,” 2017; “All about the Vegetable Group,” 2017). Mainly, recommendations for children are daily consumption of one-to one-and-a-half cup-equivalents of fruits and one-to three cup-equivalents of vegetables daily. Recommendations for adults are to consume one-and-a-half to two cup-equivalents of fruits and two to three cup-equivalents of vegetables per day.

According to the “State of the Plate Study,” (2015) by 2020 per-capita consumption of total fruits and total vegetables in the US is expected to grow at the same rate as the population growth rate, essentially resulting in flat consumption. This projection does not align with the recommendation that Americans should increase F&V

consumption for good health, but instead is consistent with the literature in that Americans are falling short of meeting the guidelines for daily intake.

Although fruit consumption increased in children between 2003-2010, most children are still not meeting the dietary recommendations for F&V, according to Kim et al., (2014). In an analysis of F&V consumption using two days of 24-hour recall data from the 2003-2004 NHANES, researches found that among adolescents, the largest consumption of fruit was in the form of fruit juice (Kimmons, Gillespie, Seymour, Serdula & Michels-Blanck, 2009). Moreover, the researchers suggested fewer than 1 in 10 Americans met the recommendations for F&V. Adult F&V intake was also examined by using data from the 2013 Behavioral Risk Factor Surveillance System (BRFSS) and determined that only 13.1% of respondents met recommendations for fruits, while only 8.9% met recommendations for vegetables (Moore & Thompson, 2015).

There is concern that fruit juice can lead to obesity and in response, one study assessed whether fruit juice, fruit, or vegetable intake had an impact on body mass index (BMI) in a sample of children and adolescents (Field, 2003). The results indicated that neither fruit juice or fruit intake led to significant changes in BMI and intake of vegetables actually demonstrated an inverse relationship with BMI among boys. However, when adjustments were made to include total calories, the benefits from vegetable consumption were no longer significant. The authors suggested that a reason for this finding might be that F&V are consumed in addition to calorie dense snacks and

meals. Therefore, the researchers recommended that interventions should target fresh F&V as healthy snack alternatives.

The School Food Environment

School settings offer a variety of programs that aim to influence the campus food environment. The National School Lunch Program and the School Breakfast Program (SBP) are two such programs. Robinson-O'Brien et al. (2010) studied the relationship between F&V intake and the location of consumption, whether in or out of school. The sample included a total of 103 students in fourth, fifth, and sixth- grades from four urban elementary schools. The researchers determined that approximately half of all F&V intake took place in school and that children with the lowest intake ate an even higher proportion of daily F&V at school, suggesting that the availability of F&V in the home may be limited. Eighty percent of the participants did not meet the daily recommendations of five or more F&V. In light of these findings, the authors suggested that the NSLP and SBP play an important role in contributing to children's daily F&V consumption, especially among low-income children.

The availability of snack foods in the school setting also impacts the intake of F&V. One study suggests a negative and significant association between à la carte programs and lower intake of F&V in a sample of seventh graders (Kubik et al., 2003). As noted in the study, in schools without à la carte programs, children met or came closer to meeting dietary recommendations for F&V. À la carte programs sold 93% of foods that would be categorized as "foods to limit." Similarly, snack vending machines were

also negatively correlated with fruit consumption in the same sample. It was observed that most of the snack and beverage offerings in vending machines were high in fat and sugar.

Fresh Fruit and Vegetable Program Overview

The Fresh Fruit and Vegetable Program is one of several USDA initiatives whose objective is to influence health behaviors in favor of increased F&V consumption in low-income schools. The program was created under the Farm Bill of 2002 and was piloted in five states in 32 schools ("Fresh Fruit and Vegetable Program Fact Sheet, 2013). The program was made permanent under the Food, Conservation and Energy Act of 2008 with $40 million in funding, later reaching a spending allowance of $150 million in school year 2012-2013. All schools with 50% or greater student participation in free or reduced-price meals are eligible to apply for the FFVP grant. Schools are permitted to spend between $50-$75 in fresh F&V per student during the school year ("Fresh Fruit and Vegetable Program Fact Sheet, 2013).

Schools must meet criteria to be eligible for participation in the FFVP. Specifically, elementary schools with 50% or more free and reduced lunch rates are eligible to apply and those with the highest rates are given priority. Schools must participate in NLSP and are also required to complete an annual application ("FFVP Handbook for Schools," 2010). Furthermore, targeted outreach to low-income schools must be undertaken in an effort to ensure that schools with the highest need benefit from the FFVP. In states where a large percentage of schools meet the 50% or more free

or reduce meals criteria, the implementing agency may choose to only target those schools with the highest need ("FFVP Handbook for Schools," 2010). As a result of increased funding, about 84% of school applications were funded in school year 2011-2012 and about 67% of all participating schools had more than 75% of students eligible for free or reduced-price meals (Bartlett et al., 2013). Moreover, in terms of demographics, a greater proportion of selected schools were largely comprised of minority students.

Schools must adhere to program implementation guidelines that include offering the F&V outside of NSLP and SBP, but within the school day and they must be made available to all children enrolled in the school regardless of participation in NSLP ("FFVP Handbook for Schools," 2010). Additionally, schools must serve the F&V at least twice during the week. Flexibility is given to the schools in other areas of the program implementation. For example, schools can establish their own monthly budgets; designate when, where and how F&V will be served; and form partnerships with local agencies for nutrition education delivery ("FFVP Handbook for Schools," 2010). Guidance and assistance from USDA Food and Nutrition Services is also available to schools. The most common location where schools choose to serve the F&V is the classroom; although they are also served in the cafeteria, (outside of NSLP and SBP) in hallways, and on mobile carts that distribute the snacks (Bartlett et al., 2013). In school year 2011-2012, the most commonly served fruits included citrus, melons and berries,

with carrots, tomatoes and cucumbers being the most common vegetables served (Bartlett, et al., 2013).

In Arizona, 108 schools are participating in in the program in school year 2017-2018, with representation from 32 school districts and charter schools. The program is administered by the Arizona Department of Education, with $3,558,433 in funding allocated to the state in fiscal year 2018 (Smith-Holmes," 2017).

Fresh Fruit and Vegetable Program Evaluation

Among the more noteworthy positive effects of FFVP evaluation are the results of a study that assessed the relationship between the FFVP and its impact on childhood obesity. Quian, Nayga, Thomsen and Rouse (2015) used FFVP data collected between 2008 and 2010 from school children in the state of Arkansas, where youth obesity rates were among the highest in the country. Arkansas became the first state to mandate the collection of height and weight biomarkers of school children and these data were utilized in this study. Using matched difference-in-differences analysis and synthetic control method, the researchers found that participation in FFVP prevented excess weight gain, suggesting a reduction in BMI z-scores by 4.2 BMI percentile points (0.168 standard deviations). The authors suggest that the FFVP can reduce rates of overweight, obesity and BMI z-scores while improving children's diets in a cost-effective way.

Several studies evaluating the FFVP point to an increase in F&V intake among children as a result of participation in the program. The Wisconsin FFVP was evaluated in 2006 to assess changes in children's attitudes and behavior towards F&V. Students in

fourth, seventh and ninth grades at 10 FFVP intervention schools responded to a pre- and post-test survey. The researchers found that compared to the control group, the children in the FFVP schools were more willing to try new F&V at school (Jamelske et al, 2008). Later research on the Wisconsin FFVP found that participating students increased intake of F&V during the snack period (Jemelske & Bica, 2012) and students consistently ate the FFVP snacks provided, although they did consume more fruits than vegetables (Jemelske & Bica, 2014). A similar study of 129 students in fourth and fifth grades measured F&V intake and other eating behaviors before the start of the FFVP at the school. The study found an increase in fruit consumption at post-test after the FFVP was implemented. An interesting finding in this study was that an increased number of children reported that asking their parents to buy F&V after trying them as part of FFVP (Bica & Jamelske, 2012).

Studies looking at the success of implementing FFVP and similar snack programs have yielded positive findings. Potter et al. (2011) reports success in getting students to try new F&V as part of the Mississippi Fruit and Vegetable Pilot Program. Fruits were more popular and preferred among the students than vegetables. A total of 22 varieties of fruits and seven varieties of vegetables were served. The researchers added that teacher support of the program made implementation run smoothly. Overall, the program was well received by students with 61% responding that they “liked it very much” in post-test questionnaires. Initial challenges to implementing the pilot included receiving the produce on time and before spoilage, and getting students to try the F&V.

These issues were identified and addressed quickly at the start of the pilot. A study evaluating FFVP implementation in New Jersey elementary schools noted that program staff, teachers, and parents perceived the program to be successful and student satisfaction was also high as reported by parents (Bai, Feldman, Wunderlich, & Aletras, 2011). Some challenges in implementing the FFVP in New Jersey included not having enough volunteers to help with daily program operation, issues in coordinating nutrition education with partner agencies and issues with communication between school staff and the families.

Fresh Fruit and Vegetable Program's Reach Beyond the School Setting

The potential for FFVP's benefits extending outside of the school setting to impact children's requests for F&V at home – even encouraging other family members to choose F&V – makes the program appealing as a public health strategy. A recent study surveyed fourth graders (n=296) in six elementary schools in Phoenix, Arizona, to examine possible associations between children's participation in the FFVP and requests for F&V made at the grocery store. Self-efficacy in choosing F&V and actual intake were also assessed (Ohri-Vachaspati et al., 2018). The FFVP schools surveyed ranged between 88% and 100% eligibility for free or reduced-price meals. Between 82% and 97% of participants were Hispanic or Black. Interestingly, all FFVP students reported going shopping with their parents. The results of the study were significant, with FFVP participating children making 1.5 more requests for F&V at the store. They also demonstrated significantly higher self-efficacy in choosing F&V in the home setting. This

research suggests that there is potential for the FFVP to have an impact beyond the school day by influencing the home food environment and grocery store purchases for F&V, particularly with minority students from low-income communities. It remains to be seen what impact children's increasing requests for F&V can have on other family members.

F&V consumption and energy intake in and outside of school were evaluated in a sample of 4,696 students in 214 schools across 16 states (Olsho et al., 2015). The FFVP and comparison schools were similar in demographics, free and reduced-lunch rates and grade levels. On FFVP days, the experimental group consumed about one-third of a cup more F&V compared to the control group. Consumption of fresh F&V also increased significantly outside of school, although total consumption was not significant. This research points to the likelihood of students increasing their F&V intake outside of school possibly due to the FFVP's effect on children's knowledge, perceptions and increased preference for F&V.

The Home Food Environment

In order to learn more about children's and parent's perceptions of the home food environment and F&V intake specifically, researchers studied 73 low-income, parent- child dyads (Robinson-O'Brien, Neumark-Sztainer, Hannan, Burgess-Champoux & Haines, 2009). Survey questions asked children and their parents about their perceptions of F&V availability in the home, accessibility to F&V, parental encouragement to consume F&V, the frequency of family meals, and actual F&V intake.

The results indicated that when compared to each other, there was 56% to 86% agreement in child and parent perceptions of the overall food environment in the home. Both children and parents reported similar availability and accessibility of F&V, parental encouragement, and frequency of family meals. Parents tended to perceive a greater availability, accessibility and encouragement of F&V on their part compared to what children perceived. Children's perceptions of the home food environment accounted for 26.7% of the variance in their F&V intake, whereas parents' perceptions only accounted for 4.9% of the variance in intake.

The literature suggests that offering F&V as snacks and increasing their availability during meal times could be an effective approach to increase children's consumption of F&V. Parent-child dyads participated in a cross-sectional study to research the impact of F&V served as snacks and at meal times (Smith et al., 2015). Children whose parents served F&V at snack and during meal times were significantly more likely to have eaten F&V the previous day. The findings also indicated that children were more likely to have consumed F&V the previous day when vegetables were served at any time in the day, thus the researchers suggested that promoting vegetables as snacks during the day could lead to increases in overall F&V consumption. In another longitudinal study looking at parental reporting of F&V availability at dinner as well as parent and child intake indicated a significant association between serving vegetables at dinner and increased adolescent intake (Arcan et al., 2007). The F&V intake of parents

resembled that of their children. These findings suggest that parents are instrumental in creating a home environment that is conducive to children eating more F&V.

Parent behaviors and their impact on child F&V consumption were studied in a group of middle school students (n=366) by Young, Fors and Hayes (2004). Children were asked about parent modeling, authoritative parenting, parent control over diet, parent support for F&V, availability of F&V and overall consumption. The results demonstrated a moderate parental influence over children's F&V consumption. Parent modeling and support of F&V significantly predicted consumption in children. Self-efficacy was a mediator of F&V consumption, while availability of F&V was a moderator of consumption.

A study of fourth and fifth graders assessed family food environments and found that 46% of children asked their parents to buy F&V and 28% also reported that their family always bought their favorite F&V (Gross, Pollock & Braum, 2010). Furthermore, 49% of children reported participating in grocery shopping. In terms of parental modeling, children who perceived high parental encouragement to eat F&V had greater average intake. In a systematic review, Pearson, Biddle and Gorely (2009) also found an association between parental modeling and intake of F&V and children's and adolescents' fruit, juice and vegetable consumption.

The Grocery Shopping Experience

Different factors influence parents in their purchasing decisions. Price and discounts appeal to parents, while children tend to respond to the marketing

environment and product placement strategies. Furthermore, when children participate in the shopping experience, both of these factors play a role in the items parents end up buying. Latino parent-child dyads (n=100) were observed during an entire shopping trip (Calderon et al., 2017). A total of 144 requests were observed and the following information was coded: the number and type of request, child attempts to influence purchases, parent response to the requests, and if the product was ultimately purchased. Children were observed to initiate most requests with only 24% of parents initiating the requests. The observational study results noted that child involvement during grocery shopping and at checkout was associated with purchase and spending outcome, indicating a mutual influence between parents and children. Unsurprisingly, children who were more involved in the shopping experience wielded more influence over the purchasing process. O'Dougherty, Story and Stang (2006) also observed parent-child grocery shopping practices. Researchers observed 142 adult-child pairs and examined interactions over food selections, yielding by parents, refusal tactics and extent of child participation. Marketing was observed to be a factor in 28.6 % of selections made by children. Requests for sweets or snacks made up 44.4% of all observations and half of all the requests children made. Parental yielding to these requests was seen 47.8% of the time. Selection of F&V was seen in 22.6% of all observations. Commonly employed refusal strategies included ignoring the child's requests and providing an explanation for the refusal. Parents also simply verbalized or

gestured a “no.” Furthermore, children were observed actively participating in the selection of F&V in more than half of the interactions taking place in the produce isle.

In a qualitative study exploring the impact of the store environment on low-income shoppers and the role of children in influencing those purchases, Wingert, Zachary, Fox, Gittelsohn and Surkan (2014) data was gathered from interviews and focus groups with adult shoppers and supermarket employees and managers. The findings indicated that children accompanying parents at the grocery store led to more unplanned and unhealthy food purchases that further strained family food budgets. The placement of unhealthy foods within the store was reported as the main reason for this, leading parents to acquiesce to their child’s demands in order to avoid conflicts at the store. The researchers recommended interventions at the store level to strategically place healthy items in areas where they would appeal to and influence children’s requests, as well as allowing children to taste healthy items.

Price Interventions as a Strategy to Increase Fruit and Vegetable Purchases

According to the literature, discounts have the potential to increase F&V purchases. In low-income families where food budgets are strained, price interventions can lead to increased F&V purchases. In a randomized control trial, two supermarkets in New York were selected to provide a 50% discount on F&V (Geliebter et al, 2013). Compared with the control group, F&V purchases were greater in the intervention stores. The intervention participants also increased their intake during the study, although once the discounts ended, the group returned to baseline purchasing patterns.

Another randomized control trial (Mhurchu, Blakely, Jiag, Eyles and Todgers, 2010) evaluated price discounts and nutrition education and their impact on supermarket food purchases. Eight New Zealand supermarkets participated in the intervention over a six-month period. The researchers found that participants randomly assigned to receive a 12.5% discount on their grocery bill increased their healthy food purchases and saw an increase of 10-11% from baseline in F&V selections. At 12 months of follow-up, the effects of the intervention remained sustained.

Low-income people enrolled in food assistance programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) can also benefit from further discounts to increase their purchases of F&V. Herman, Gail, Harrison, Abdelmonem and Jenks (2008) conducted a quasi-experimental study looking at whether subsidies to purchase F&V increased consumption in female WIC program participants. Interventions took place in two treatment settings; in the supermarket and at the farmer's market. The results showed that total consumption of F&V increased in both intervention groups through the duration of the study. Further, consumption was sustained 6-months after the study.

CHAPTER 3

METHODS

Data Collection

The original study from which the data for the present study were drawn was conducted by the Arizona State University Food Policy and Environment Research Group (Gruner, DeWeese & Ohri-Vachaspati, 2016). Two trained data collectors facilitated four focus group discussions with parents of children attending FFVP schools. A FFVP Interview Guide was created to guide the discussions. The guide consists of five areas of discussion: awareness of FFVP, shopping prompts, views on cross-promotion between the FFVP schools and grocery stores, likelihood of responding to cross-promotion efforts, and awareness of the Supplemental Nutrition Assistance Program-Education (SNAP-Ed), an obesity-prevention grant targeting nutrition and physical activity education in low-income areas. Open-ended questions were asked within each of these topics. The FFVP Interview Guide can be found in Appendix A. Three focus groups were conducted in Spanish and one was conducted in English. Spanish focus group discussions were translated to English text. All focus groups were audio recorded and transcribed verbatim.

Setting and Participants

The data were compiled from a total of four focus groups held with parents at three schools in Phoenix, Arizona. The schools were selected from two school districts. Participating schools were identified through their participation in both the FFVP and

SNAP-Ed. Parent participants (n=25) were recruited by the school staff. Table 1 displays the number of participants in each focus group and the language in which each focus group was conducted. Focus group discussions were between 44 minutes and one hour and six minutes long. The majority of parents were female with only two male participants. Most participants were in the 35-50 age range. Four participants reported having a post-secondary degree. Additionally, five parents participated in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and ten parents participated in SNAP.

Table 1. Parent Focus Groups

Focus Group (FG) #	District	School	Language	# of Participants	Length of FG in minutes
FG 1	1	School 1	English	N=5	44
FG 2	1	School 1	Spanish	N=7	44
FG 3	#	School 2	Spanish	N=7	48
FG 4	#	School 3	Spanish	N=6	66

Data Coding

Transcripts from the four parent focus groups were imported into MAXQDA (Version 2018), a qualitative data analysis program, and coded using an inductive thematic analysis approach to identify key themes across the four focus groups. Thematic analysis aims to identify, analyze and report patterns or themes, within the data (Liamputtong, 2011). This type of analysis offers flexibility and is not bound to any

particular theoretical framework, while the themes themselves are linked back to the data, as noted by Braun and Clarke (2006). Codes, or themes, are features taken from the data, in this case the focus group transcripts, which are of interest to the researcher and can be assessed in a meaningful way. Coding in itself is part of the analysis process. The researchers suggest there is no right or wrong way to assign prevalence to the data, but ideally there should be a number of occurrences of the themes across the data. Furthermore, the authors propose a six-phase guide to conducting thematic analysis of qualitative data, which was generally employed in analyzing the data for the present study. Figure 1 presents the six-phases of thematic analysis.

Figure 1. Phases of Thematic Analysis

Phase	Description of the process
1. Familiarising yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking in the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells; generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Two sections in the FFVP Interview Guide, Awareness of the FFVP and Shopping Prompts, contained questions directly relating to the purpose of the present study and are outlined in Table 2.

Table 2: FFVPP Interview Guide Questions Relating to the Study

Awareness of FFVP	Home Food Environment	Shopping Practices
Question 2. Can you tell me what have you heard about the Fruit and Vegetable Snack Program also known as the Fresh Fruit and Vegetable Program? *Prompts:* *i. How did you learn about the Fruit and Vegetable Snack Program?* *ii. What has your child told you about the program?* *iii. If no one has heard of the program: has your child ever mentioned a snack program at school? What have they said about this program?* **Question 5: What impact do you think the Fruit and Vegetable Snack Program has on your child's health?** **Question 6. Do you think the Fruit and Vegetable Snack Program is a good way to encourage children to eat more fruits and vegetables, why or why not?**	**Question 4. How do you think the Fruit and Vegetable Snack Program affects what your child eats at home?** *Prompts:* *i. How frequently does your child ask for fruits and vegetables that they tried in school to be made available at home?* *ii. How frequently does your child ask for these items they tried at school to be purchased at the grocery store?* *iii. If no one has heard of the program: How do you think school programs affect what your child eats at home?*	**Question 7. When your child goes grocery shopping with you, how are they involved in the shopping process?** *Prompts:* *i. How often do they go to the grocery store with you?* *ii. What items do you let them pick out?* *iii. Do they put things in the cart without asking?* *iv. What sort of things do they ask and or nag you for?* **Question 10. We talked earlier about the Fruit and Vegetable Snack Program. How has your child's participation in this program influenced your food shopping, if any?** *Prompts:* *i. Do your children ask you to purchase fruits and vegetables they tasted at school?* **1. If YES:** Can you describe instances when that has happened?

Data Analysis

Transcripts for each focus group were read and a list of general ideas was created; content that was initially perceived as relevant to the present study was highlighted. Transcripts were imported in MAXQDA (Version 2018) and the initial coding began by grouping of similar data, which was further organized into three main categories: 1. General Perceptions of FFVP, 2. Impact of FFVP on the Home Environment, and 3. Impact of FFVP on Shopping Practices. Each category was given a definition using memos. Potential themes that emerged within each category were also given a definition, and direct quotes were taken from the transcripts to provide further context. The data was coded a second time by a different coder; both coders then came together to discuss the categories, refine themes and address differences to arrive at a consensus. Only themes that appeared in the data five or more times were retained for reporting and analysis. The final codebook with all coded themes was used to summarize the findings.

CHAPTER 4

INFLUENCE OF CHILD PARTICIPATION IN THE FRESH FRUIT AND VEGETABLE PROGRAM AND HOME FOOD ENVIRONMENTS AND SHOPPING PRACTICES

Abstract

Background. In order to address under consumption of fruits and vegetables (F&V) among children, the Fresh Fruit and Vegetable Program (FFVP), a United States Department of Agriculture (USDA) initiative, aims to increase exposure and consumption of F&V in children attending low-income schools. Child participation in FFVP has been associated with increased preference for, and consumption of F&V. Additionally, research suggest that the FFVP has the potential to decrease rates of overweight and obesity in participating children. The benefits of this program have also been found to extend outside of the school setting.

Objective. This study aims to explore how children's participation in the FFVP influences home food environments and shopping practices at the grocery store.

Design. Four focus groups (FG) were held with parents of FFVP participating children. Two trained data collectors led the discussions using the FFVP Interview Guide. Three focus groups were conducted in Spanish and one was conducted in English. Data was translated and transcribed verbatim.

Participants. Focus groups took place at three FFVP participating schools in two school districts in Phoenix, AZ with a total of 25 parent participants.

Phenomenon of Interest. Perceived influences of child's participation in FFVP on behaviors of children and parents towards F&V.

Analysis. A qualitative analysis of parent focus groups was done using an inductive thematic analysis approach to find themes and patterns within the data. Themes were identified under three categories: General Perceptions of FFVP, Impact of FFVP on the Home Food Environment and Impact of FFVP on Shopping Practices. Themes with a frequency greater than five were retained for reporting.

Results. Eleven themes were identified across the three categories. Overall, parents shared that children learned about new F&V and enjoyed the FFVP snacks, they made healthier choices, like choosing salad for lunch, and made requests for F&V at home and at the grocery store. Children from FFVP schools were involved in the shopping process by picking F&V. Parents were influenced to learn about and try new F&V, and changes were noted in family meals. Parents also indicated preparing and offering F&V as snacks.

Conclusions and Implications. The FFVP is an effective school food program that has a positive impact on parent and child behaviors in the home and at the grocery store.

Introduction

Longitudinal research suggests that obese youth remain obese into adulthood (Gordon-Larson, The & Adair, 2010) and inadequate intake of F&V is associated with overweight, obesity and central adiposity in youth (Bradlee, Rinder, Qureshi and Moore, 2009). Additionally, F&V consumption has been linked to decreasing the risk for type 2 diabetes (Wu, Zhang, Jiang & Jiang, 2014) and other chronic diseases (Liu, 2013), as well

as all-cause mortality (Bellavia, Larsson, Bottai, Wolk & Orsini, 2013). Nevertheless, most children do not consume enough F&V (Kim et al., 2014) and neither do adults (Moore & Thompson, 2015).

One school-level food program, the Fresh Fruit and Vegetable Program (FFVP), has seen associations between child participation and an increased preference for (Jamelske, Bica, McCarty & Meinen, 2008) and consumption of (Barlett et al., 2013; Bica & Jamelske, 2012;Jamelske & Bika, 2012 and 2014; Olsho et al., 2015) F&V. Furthermore, other FFVP evaluation studies suggest that the benefits of the program extend outside of the school setting (Bartlett et al., 2013) by increasing self-efficacy to choose F&V at home and increased requests for F&V at the grocery store. (Ohri-Vachaspati et al., 2018). Of particular importance, one study found that participation in FFVP prevented excess weight gain and reduced BMI (Body Mass Index) z-scores, and rates of overweight and obesity (Quian, Nayga, Thomsen and Rouse, 2015).

Using parent focus group data collected by the Arizona State University Food Policy and Environment Research Group (Gruner, DeWeese & Ohri-Vachaspati, 2016), the present qualitative analysis aims to explore the influence that FFVP participating children have on the home food environment and shopping practices.

Methods

Study Design

Two trained data collectors facilitated four focus groups with parent participants. An FFVP interview guide was created to direct the discussions. Two

sections in the interview guide were identified to contain questions directly relating to home food environments and grocery shopping practices. Three focus groups were conducted in Spanish and one was conducted in English. Spanish focus group discussions were translated to English text and all focus groups were audio recorded and then transcribed verbatim. Staff at each of the schools assisted in the recruitment of parent participants. The focus groups took place in school cafeterias and classrooms. Participants were offered a $10 gift card as an incentive for their participation.

Setting and Participants

Parents were recruited from three FFVP schools within two districts in Phoenix, AZ. A total of 25 parents, most between the ages of 35-50, participated in the four discussions that lasted between 44 minutes and one hour and six minutes. The majority of participants were female, with only two male participants.

Data Collection

A focus group guide was created to help data collectors in leading discussions. Two sections in the guide contained questions relating to home food environments and shopping practices. Three questions asked parents how they learned about the program or what their child had shared, whether they though the FFVP was a good way to encourage children to eat F&V, and how they though the FFVP impacted their child's health. One question about the home food environment asked parents how they thought the FFVP influenced what their child ate at home. Finally, two questions asked the participants about their child's involvement in grocery shopping, and how the child

influenced their food shopping with a specific prompt about children asking for F&V that they tasted in school.

Data Analysis

Transcripts from the four parent focus groups were imported into MAXQDA (Version 2018), a qualitative data analysis program, and coded using an inductive thematic analysis approach to identify key themes across the focus groups. Braun and Clarke (2006) proposed a six phase guide for conducting thematic analysis, which was used to guide the analysis in this this study. The six phases include: 1. Familiarizing yourself with the data, 2. Generating initial codes, 3. Searching for themes, 4. Reviewing themes, 5. Defining and naming themes, 6. Producing the report.

Initial coding began by highlighting and grouping of similar data, which was further organized into three main categories: 1. General Perceptions of FFVP, 2. Impact of FFVP on the Home Environment, and 3. Impact of FFVP on Shopping Practices. Each category and theme were given a definition using memos within the MAXQDA program. Memoing refers to a research technique in qualitative analysis where the researcher writes memos to clarify thinking on a topic; the recording of ideas may later serve to give meaning to data and refine themes (Birks, Chapman & Francis, 2008). Using the codebook that was produced, the data was coded a second time by a different coder. Both coders then came together and discussed the categories, refined themes and addressed differences to arrive at a consensus. Emerging themes in the data that were coded five or more individual times were retained. A final codebook with all themes was

used to summarize the findings.

Findings and Discussion

The emerging themes within the three categories are summarized in Table 4a. Sub-themes emerged in two of the three categories. In the home environment category, the theme, **choosing healthier foods and snacks** included the sub-theme, **parents serve F&V as snacks**. The theme, **changes in parent F&V behaviors** also included the sub-theme, **parent modeling**. In the shopping practices category, the sub-theme, **children help select F&V**, emerged within the theme, **children's involvement in shopping practices**. Finally, the theme, **children request to buy F&V**, also included the sub-theme, **specific requests for FFVP items**.

Table 4a: Summary of Categories and Themes

Category 1: General Perceptions of FFVP
Children learn about and enjoy F&V
Awareness of farm to school programs
Children make healthier choices
Category 2: Impact of FFVP on the Home Food Environment
Choosing healthier foods and snacks
Parent F&V behaviors
Children request F&V at home
Children talk about or bring F&V home
Category 3: Impact of FFVP on Shopping Practices
Children's involvement in shopping practices
Children request to buy F&V
Children request non-produce items
Parents decline or limit unhealthy requests

Category 1: General Perceptions of FFVP

Most parents did not know the FFVP by name, but they were aware that their child was receiving F&V snacks through a school program. The first category, **General Perceptions of FFVP,** was defined as observations made by parents about how participation in the F&V snack program impacts their children and their personal opinions about the program. For the purpose of this paper, participant references to school F&V snack program are referred to as the FFVP. Table 4b outlines each of the emerging themes, as well as the frequency of each coded theme, and whether themes spanned across interviews. This information is noteworthy as some themes may be less frequent or may not be present in all four focus groups, which may impact the strength and representation of the theme.

Table 4b: Category 1 – General Perceptions of FFVP

Category 1: General Perceptions of FFVP		
Theme	Code Frequency	FG Frequency (N=4)
Children learn about and enjoy F&V	20	4 100%
Awareness of farm to school programs	9	2 50%
Children make healthier choices	6	1 25%

The most cited theme, **children learn about and enjoy F&V**, was defined as children learn about a variety of F&V and expressed that they like the F&V served by FFVP. Parents shared their children's positive comments about enjoying the F&V and

they were also aware that the children had the opportunity to try a variety of new F&V through the program. One parent shared the following:

> "It's like an experience, like something new for them, and they show more interest. Mainly the new weird fruits they never saw before caught their attention [FG 4]."

Parents' comments also suggested a higher level of awareness of the program's operation, including days on which the children receive the F&V snack:

> "My daughter likes snack days, which is on Tuesdays and Thursdays. They are given fruits and vegetables. She eats most vegetables; there are some she doesn't like, but she eats most of them, and fruits, too [FG 3]."

These findings are in line with FFVP evaluation on increased preference for F&V in participating children (Jamelske, Bica, McCarty & Meinen, 2008; Bartlett, et al, 2013).

Parents also seemed to be aware of other efforts at the school level to get children interested in F&V, specifically farm tours and school gardens. Parents at two schools demonstrated **awareness of farm to school programs**, which was a theme defined as parent discussions about other school programs that encourage exposure to F&V. One of the schools had a garden and the parents shared about the connection their children made between growing and eating vegetables. Vegetable gardens have become popular in schools in recent years and are pushed as a strategy to get children to eat more F&V; however, in a cluster randomized controlled trial, Christian and colleagues (2014) found no statistically significant increases in F&V consumption as a result of school gardens alone where the garden operated on a minimal level. However, the authors suggested that garden programs implemented with higher consistency,

parent involvement, and in addition to other educational activities promoting F&V may have the potential to increase consumption. Interestingly, parents who were aware of farm to school projects at their school brought up the subject on their own, without being asked about it, and seemed to be directly involved in those efforts. It is possible that pairing the FFVP with strong, consistent school garden projects and parent participation may serve to further promote F&V. A parent who was aware of a garden project at their child's school offered:

> "We've been in the garden, they haven't called the parents but they did last year […] and they [children] get excited of seeing how they grow […] and they can eat it [FG 4]."

Another school had kindergarten students tour a farm during the week when focus groups were conducted. A parent shared:

> "But going to the farm definitely helps. I know they talked about vegetables today. And I mean, I know some schools have like their own little farms or their own little gardens, so I think that – there's lots of little steps that can contribute too [FG 1]."

Parents were able to recognize changes in their child's behavior through the theme **children make healthier choices.** This theme was defined as the FFVP influencing children to choose healthier foods, for example, by opting to eat from the salad bar during lunch. This resonates with research that found a strong association between school participation in the FFVP program and availability of fresh F&V in school lunch (Ohri-Vachaspati, Turner & Chaloupka, 2012). Furthermore, other research found that child participation in FFVP is associated with children making increased requests for F&V (Ohri-Vachaspati et al., 2018). Both the availability of more F&V in school lunches,

coupled with children learning about and trying new F&V through the FFVP, could be leading children to opt for healthier F&V as part of their lunch. Parents shared the following:

> "I think it […] helps them make healthier choices when seeing – like at lunch, should I pick this or that instead of […] pizza every day [FG 1]."

> "They go to the salad bar. They tend to go straight there after, not just skip it and go sit down like other kids. I see a lot of kids actually here go to the salad bar [FG 1]."

This theme also generally expresses how children participating in FFVP may create healthier habits from a young age and grow up accustomed to making F&V a part of their diet. A parent shared:

> "And it sticks with them, especially if you start young. It sticks with them, and they take it home. […] They grow up knowing that that's normal and that's the way it should be. You should be eating – that should be included every day in your diet, so that makes it easier for them [FG 1]."

Category 2: FFVP Impact on Home Environment

The second category, **Impact of FFVP on the Home Food Environment**, consists of four themes which are listed along with their frequencies in Table 4c. This category was defined as the effect that the child's participation in the FFVP has on the home food environment.

Table 4c: Category 2 – Impact of FFVP on Home Environment

Category 2: Impact of FFVP on Home Food Environment		
Theme	Code Frequency	Interview Frequency (N=4)
Choosing healthier foods and snacks	22	4 100%
Parent F&V behaviors	15	4 100%
Children request F&V at home	15	4 100%
Children talk about or bring F&V home	13	4 100%

The most prominent theme in the category of home environment was **choosing healthier foods and snacks**, which was defined as changes in how parents routinely prepare meals, or family members choosing healthier foods, as well as the offering of F&V as snacks. Parents shared about making changes and adding vegetables in meals:

> "It changes the way we eat. It influences in a way in which we learn, and we begin to change the routine we have all the time with tortilla, meat, beans, and rice. We begin to use vegetables. [FG 3, Participant 1]."

> "… I see that before, they [children] would eat a lot of pizza and hamburgers. I would tell her that that wasn't good […] What I do is I have more fruit – if there's fruit, they will eat fruit. […] if there are vegetables, they will look for vegetables in the refrigerator. But I see that they have pushed pizza and hamburgers aside [FG 3, Participant 4]."

This theme contained the sub-theme, **parents offer F&V as snacks.** In a study by Smith et al. (2015), the researchers found that the availability of F&V as snacks throughout the day, and not just during meals, could lead to increases in F&V intake. It was interesting to find that not only are parents making F&V snacks available, they also engage in certain strategies to make sure that the F&V are consumed. Parents mentioned cutting, slicing, bagging and storing F&V for their children. Parents expressed

preparing snacks for their child's convenience and stated that it was important for the snacks to be ready for them on the go. To parents, this was important and it further demonstrated their willingness to take the extra steps if it meant that the child would eat the F&V. Parents mentioned:

> "Do you want it sliced?" or "I want it on a fork." But I give it to them as a snack, and they love it [FG 3]."

> "You can hear many people saying, "My children don't eat the fruit." But if you think about it, they have them inside the refrigerator inside a bag, the kids won't take them and wash them and eat them [FG 4]."

Parent F&V behaviors was also identified as a theme and was defined as parents learning about and trying new F&V, with **parent modeling** emerging as a sub-theme. Parents mentioned trying F&V that they have not ever had before, and eating the F&V along with their children. One parent shared:

> "…the star fruit, we went shopping and I didn't know what it was and he showed me what it was and told me how it felt and everything. He said we ought to try it. It's good. And it's like okay. We'll try it. We tasted it. It was good. So it's like yeah, he helped us pick out something new because of what he learned here, which was real helpful [FG 1]."

Parents recognized that they also play a significant role in their own children's behavior, the sub-theme **parent modeling** was defined as parents modeling eating F&V to their children as well as verbally encouraging them to try new F&V. This was an important finding in light of several studies that have found associations between parent modeling and support of F&V and increased consumption in children (Gross, Pollock & Braum, 2010; Pearson, Biddle & Gordon, 2009; Young, Fors & Hayes, 2004). Some parents mentioned eating the F&V along with their child:

> "But remember that we have to be an example. […] You have to try it so that […] they see more, and they eat [FG 2]."

> "And if he sees I'm eating, he will, too. But if not, then no, he won't want any. So I have to make the initiatives [FG 3]."

Parents noticed that they don't struggle as much to get their child to eat F&V and their requests are becoming more frequent as portrayed in the theme, **children request F&V at home**. In a study, Bartlett et al. (2013) found that 45% of parents reported that their child asked for F&V at home since the start of the FFVP. A parent mentioned the following:

> "They ask for it because, my daughter, she says, "Mommy, cook more vegetables." And when she was smaller, it was a struggle [FG 3]

Olsho et al., (2015) also found that FFVP children ate significantly more F&V than their counterparts. Parents noted that children were eating things they were not willing to try before at home and it was due to the child's participation in the FFVP. Parents offered:

> "Before, they really didn't like some of the vegetables, and now, they like them raw. Before, they didn't. [FG 3]."

> "They want more of the same things, this is my case with my children, for example with oranges, she loves oranges and she wants them in pieces just like she has them here and they're always eating oranges [FG 4]."

Category 3: FFVP Impact on Shopping Practices

The third category, **FFVP Impact on Shopping Practices**, was defined as common shopping practices and changes resulting from the child's participation in FFVP. Table 4d describes the themes in this category and the frequency of codes and interviews.

Table 4d: Category 3 – Impact of FFVP on Shopping Practices

Category 3: Impact of FFVP on Shopping Practices		
Theme	Code Frequency	Interview Frequency (N=4)
Children's involvement in shopping practices	23	4 100%
Children request to buy F&V	20	4 100%
Children request non-produce items	16	4 100%
Parents decline or limit unhealthy requests	6	3 75%

The theme, **children involvement in shopping practices,** described the extent to which children participate in the shopping experience with their parents and in what sorts of ways they are involved. Most parents mentioned frequently taking their children grocery shopping, while a few others had their children participate only occasionally.

> "Mine are very involved. We all go. I think we're all used to it now. Because they were little, we used to take them all the time with us everywhere, so we went grocery shopping with them [FG 1]."

> "When they go with – they're pretty involved – which vegetables and fruits do you want this week, what should we get this time, let's try this. And we always try to at least once a week pick out something new [FG 1]."

Parents shared that their children helped to cross things off lists and to choose the types of F&V to buy. The sub-theme, **child picks out F&V while shopping,** emerged within the theme of how children are involved in shopping. Many parents reported that their children selected the F&V and even used their knowledge of how to pick items

with the best quality. Similarly, in a study of parent-child co-shoppers by O'Dougherty, Story and Stand (2006), children were observed actively participating by picking F&V in half of all of the observations made in the produce section. A parent shared her experience with her child helping to select produce:

> "I tell her, "Bring me this and that." And she goes and bring them, "Mom, like this, right?" And she knows how to choose the apples, she gives me the lettuce, she chooses the celery [FG 4]."

Children request to buy F&V was also a common theme in this category. This theme includes requests made by the child at the grocery store while shopping, as well as requests made to parents to purchase items for them. This is in line with a recent study reporting that students in FFVP schools made more requests for F&V while shopping with parents (Ohri-Vachaspati et al., 2018). A sub-theme emerged within this theme that was related to **requests made specifically for FFVP items** that children tried in school. Slightly more than half of the coded themes (11) were for FFVP item requests. Parents shared their experiences:

> "What she likes the most are pears, kiwi; that's what she likes the most and that's what she always try to add to the cart [FG 4]."

> "Well, that they try them here, then you go to the store and you ask, "What? You like it?" "Yes, I've eaten that at school." And it's when one buys it [FG 2]."

In some instances, the requests to purchase F&V went beyond a simple ask, to a more persistent nagging, for example parents said the following:

> "More fruit and vegetables. I mean, we already eat it, but it's more. More intense every time, which is great [FG 1]."

> "Mom, did you bring me the grapes?" "No, I'll bring them tomorrow." And if I

don't do it he keeps telling me until I have the chance to go and get them [FF 4]."

Although parents reported that their children made many requests for F&V, they also reported many **requests for non-produce items** while at the grocery store. Children typically asked for candy bars, chips, or food items such as yogurt, cereals and baked goods. The concept of snack restriction preventing the displacement of F&V is not uncommon in the literature. Gonzalez, Jones and Frongillo (2009) found that although restricting snacks at the school level increased the consumption of F&V, when available, children prefer other foods to F&V. With so many options in the grocery store setting, it is not surprising that children requested non-produce items and snacks just as much as F&V.

> "Cookies. Stuff that I wouldn't really normally let them eat. But I let them slide here and there [FG 1]."
> "…they also add junk food like hot Cheetos [FG 4]."

Some parents also indicated that their children were influenced by marketing and packaging or by items that contained characters that appealed to them. They shared:

> "…[what] they see on TV, the cereals that are from the new movie [FG 2]."

> "Last night there was a little animal on a cheese; a little cow. And they want that also [FG 2]."

In an observational study of parents and children at the grocery store, Calderon et al. (2017) found that children had great influence over purchases and marketing was observed to be a factor in 28.6% of children's requests. Unfortunately, Lapierre, Brown, Houtzer and Thomas (2017) described that items in the grocery that target children via

marketing on packaging tend to be of less nutritional quality, even when nutritional claims are present.

Parents decline or limit requests for unhealthy items emerged as a theme in response to children making requests or attempting to sneak unhealthy items in the cart while grocery shopping. Parents tended to limit the "junk foods" by only allowing a child to take one item. O'Dougherty, Story and Stand (2006) also reported in their observational study that parents employed several tactics to limit or refuse requests for unhealthy items, most often using a verbal "no" or an explanation of why not, or ignoring the requests. Parents mentioned the following:

> "…or occasionally we'll let them get a donut or something. So then they're like oh, a donut? No, not today [FG 1]."
>
> "I don't want them eating a lot of chips, or things that aren't good for them. I tell them, "Sweets, yes, one, but no more." [FG 3]."

One parent described her experience explaining to her child that the cost of an item was prohibitive and the child opted for a healthier, less expensive option.

> "I don't have enough money for chocolate chip cookies" and they don't do tantrums […] They say, "Okay, mommy. There isn't enough money, so we can get some bananas."

Conclusion

In general, the themes that emerged from the parent focus groups pointed to the FFVP having a positive influence on behaviors for F&V at home and in the grocery store. Parents were aware of the FFVP and perceived the program to be important for

their children's health. They also observed that children enjoyed the F&V served and that their knowledge about them also increased. In the home, parents noted child requests for F&V, particularly those served through FFVP. Parents offered F&V as snacks and even made changes to family meals to include more F&V. At the grocery store, children were involved in the shopping process, especially in helping to pick F&V. Children also made requests to buy non-produce items while shopping, although parents responded by limiting or rejecting request for unhealthy items.

This study had several strengths. First, because of the high Hispanic population at participating schools, it was important to offer bilingual focus groups, therefore, three of the four focus groups were done in Spanish. Second, the study had good representation; the number of focus groups (four) and the number of participants per focus groups (between five and seven), was similar to the recommendation of at least four to six participants and a minimum of three to five focus groups (Liamputtong, 2011). The frequency of the themes mostly spanned across multiple focus groups. Finally, double coding was employed in this study with a second coder also coding the transcripts and later discussing findings. This allowed for any discrepancies in the codes to be addressed and to identify and combine similar codes to produce an accurate codebook.

Limitations

Some limitations exist in this study. The four focus groups included a small sample of 25 participants. The three participating schools were recruited from SNAP-Ed

participating schools serviced by the Maricopa County Department of Public Health. The three schools were recruited from only two school districts, which hinders maximum variation sampling, or the purposeful selection of a wide sample that allows for unique and diverse variations in the data and is ideal in qualitative analysis when dealing with a small sample (Patton, 1990). Consequently, results may not transfer to rural areas where proximity and access to grocery stores is different. Additionally, some limitations common in qualitative analysis exist. Only one format, focus groups, was utilized. Thematic analysis can also be subjective, and although the general guidelines set forth by Braun & Clarke (2006) were employed, the analysis in itself is open to much flexibility and the interpretation by the researcher.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

There is limited qualitative research in the literature exploring the experiences and behaviors of FFVP participating children and their potential to influence home food environments and shopping practices at the grocery store. The true long-term success of a school food program, like the FFVP, as a public health measure to increase F&V consumption, can be judged by the positive impact it can have on participants outside of the setting in which it is provided. This analysis points to the FFVP's potential to have an impact on children's, and possibly parents', F&V consumption beyond the school setting.

In general, parents had positive perceptions of the FFVP, including that children enjoy the F&V snacks and that they help their child's health. Children make better choices as they learn about new F&V and eat them with their peers. Parents are aware of other F&V promoting programs including farm to school programs and school gardens.

The focus group data provides valuable information about how the home food environment is influenced by FFVP participating children. For example, children make requests for F&V, and particularly those served through FFVP. Children also share with their parents about the F&V that they are eating, which in turn may lead parents to also learn and try new F&V they have never eaten before. Parents and family members make changes in family meals and are opting to offer and prepare F&V snacks. Parents also

acknowledge the importance of modeling positive behaviors with F&V so that their children will be encouraged to eat them.

In terms of shopping practices, parents report that their children actively participate in the grocery shopping experience by helping to pick out F&V. Children's requests to buy F&V, particularly those served in FFVP, were also observed by parents. In some instances, children were nagging their parents to buy F&V. Children also requested non-produce, and sometimes unhealthy items, and parents proposed strategies to limit or decline these requests. Both parents and children respond well to store promotions and sales for F&V, possibly hinting at the importance of using these as strategies to increase F&V purchases.

The findings of this research are particularly relevant as the nation combats the current obesity epidemic. Since the first F&V snack program pilot, the efforts of the FFVP to increase exposure and consumption of F&V in low income school children have produced favorable results. Further studies are needed to understand how the FFVP may impact home food environments and grocery shopping practices, which could potentially support expanding the current FFVP program to reach more schools, or to develop new strategies that target the program's impact outside of the school setting, such as adding a parent education component.

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APPENDIX A

FFVP INTERVIEW GUIDE

FFVP Interview Guide
Parent Focus Groups

A. Focus group instructions

As people enter, present them with consent form, have them read and sign it, and give them copy of the IRB letter for them to keep. Then offer refreshments.

Welcome. I hope you've all had a chance to get some refreshments. Before we begin, please silence your cell phones.

Thank you for joining us today; we appreciate the time and effort you are making to participate in today's discussion. Tonight we will be talking about school food programs and shopping at nearby grocery stores.

My name is _____ and I will lead our discussion today. I am part of a research study being conducted by researchers at Arizona State University. I am here today because of my skills moderating discussion groups like this one. I'm looking forward to tonight's discussion.

I also want you to know that _____ is here to take notes on our discussion today.

The reason we asked you to be part of the group discussion is to learn about your opinions and ideas on this important topic of school food programs. Before we get started, I want to go over a few reminders:

- Please don't hesitate to speak up.
- There are no wrong answers. Your ideas are very important to us.
- You are encouraged to talk freely with others in this group. You don't need to talk only to me.
- Everything that you tell us today will be kept confidential.
- Please remember to use only your first name during our discussion today.
- We will be recording this session for accuracy. We will transcribe the audiotapes and combine all of your responses. Your first name will only be used for recoding and transcription purposes. It will not be connected with any answers or comments you provide in any of the reports.
- A summary report of the discussion will be made and shared with study investigators. Again, the report will not contain any information that could identify any participant.

- So we can hear each other clearly, I request that one person speak at a time. We value everyone's opinion and will make sure you get adequate time to express your thoughts.

Thanks so much for being here and agreeing to participate.

Turn on tape recorder, state the date, your name and name of school where focus group is being held.

B. Focus group interview guide

Start time: ___:___

Opening introductions

First, I'd like to start by asking each of you to take a minute to tell the rest of the group a little about yourself. Tell us your first name, how long have you lived in this neighborhood, how many children you have attending <name of school> and how old they are. Remember, don't tell us your last name for confidentiality.

(Participants introduce themselves).

Thank you. Now we are going to move into the discussion. We would like to start talking generally about school food programs.

Awareness of the Fresh Fruit and Vegetable Program

1. **As some of you have indicated there are a variety of school food programs available at your child's school <*name of school*>. For example, your children may be participating in the school lunch or breakfast program. One such program offered by your child's school is the Fresh Fruit and Vegetable Snack program. Have you heard about the program from your child or their teachers?**

   (Pause to acknowledge their affirmative or negative responses).

   Then add: **Selected elementary schools, such as <*name of school*> provide free fresh fruits and vegetables to students as a snack during the school day. These fresh fruit and vegetable snacks are not part of the school lunch or breakfast program and are offered at least twice a week to students.**

2. **Can you tell me what have you heard about the Fruit and Vegetable Snack Program also known as the Fresh Fruit and Vegetable Program?**

   Prompts:
   i. *How did you learn about the Fruit and Vegetable Snack Program?*
   ii. *What has your child told you about the program?*
   iii. *If no one has heard of the program: has your child ever mentioned a snack program at school? What have they said about this program?*

3. **How do you think the Fruit and Vegetable Snack Program affects what your child eats at school?**

   Prompt:
   i. *How does your child talk about the different fruits and vegetables they have tried at school?*

4. **How do you think the Fruit and Vegetable Snack Program affects what your child eats at home?**

   Prompts:
   i. *How frequently does your child ask for fruits and vegetables that they tried in school to be made available at home?*
   ii. *How frequently does your child ask for these items they tried at school to be purchased at the grocery store?*
   iii. *If no one has heard of the program: How do you think school programs affect what your child eats at home?*

5. **What impact do you think the Fruit and Vegetable Snack Program has on your child's health?** ***(or what impact do you think a fruit and vegetable snack program would have on your child's health?***

   If parents haven't heard of the FFVP: **What impact do you think a fruit and vegetable snack program would have on your child's health?**

6. **Do you think the Fruit and Vegetable Snack Program is a good way to encourage children to eat more fruits and vegetables, why or why not?**

7. **When your child goes grocery shopping with you, how are they involved in the shopping process?**

   Prompts:
   i. *How often do they go to the grocery store with you?*
   ii. *What items do you let them pick out?*
   iii. *Do they put things in the cart without asking?*
   iv. *What sort of things do they ask and or nag you for?*

Shopping prompts

8. How do you use weekly store flyers when shopping?

Prompts:
i. How do you use store flyers for fruits and vegetables?

9. What types of signs have you seen in the grocery store for promoting certain foods? And how do these signs influence what you purchase at the store?

a. ***If needed****: These would be things such as shelf tags, banners; buy one, get one free.*

Prompts:
i. How do signs influence your fruit and vegetable purchases?

10. We talked earlier about the Fruit and Vegetable Snack Program. How has your child's participation in this program influenced your food shopping, if any?

Prompts:
i. Do your children ask you to purchase fruits and vegetables they tasted at school?
1) **If YES:** Can you describe instances when that has happened?

11. Have you experienced any instances when a store has run out of fruit or vegetable items that your child asked for? (*Probe: can you tell me more about those instances?)*

Views on cross-promotion between schools and retail

Now we are going to talk about possible ways for promoting fruit and vegetable purchases at the grocery store.

12. What do you think about the idea of grocery stores near your child's school promoting the fruits or vegetables in the store that your children try at school as part of the Fruit and Vegetable Snack Program each week? For example, tagging fruits and vegetables in the grocery store that are part of the Fruit and Vegetable Snack Program, to let parents know which items students are getting at school? They could also advertise these items in weekly flyers, coupons, sales, in-store nutrition education activities.

13. In your opinion, what would be the best way for the school to let parents know about grocery stores that are promoting the Fruit and Vegetable Snack Program and fruits and vegetables?

Prompts: what about:

i. *Sending notes home with students?*
ii. *Listing information on school website?*
iii. *Making general announcement about FFVP at the beginning of each semester?*
iv. *Any other ideas?*

Likelihood of responding to cross-promotion

14. If the stores were to promote these specific fruits and vegetables (that your children try at school as part of the Fruit and Vegetable Snack Program), what would your likely response be if you saw promotions in the grocery store?

a. ***If needed****:* like signs or advertisements for items that are part of the Fruit and Vegetable Snack Program?

Prompts:
i. *What would make you notice them?*
ii. *How likely would you be to act upon those promotions and purchase those items?*
iii. *How likely would you be to pay attention to them at first? What about over time?*

15. Which types of promotions would make you the most likely to purchase the fruit or vegetable being promoted?

Awareness of SNAP Ed

16. How familiar are you with SNAP-Ed, the nutrition education program offered at <*name of school*>?

a. ***If needed****: As part of this program nutrition education is offered in classrooms or sometimes they provide promotional materials like student planners with nutritional messages.*

Prompts:
i. *What do you know about this program and how did you learn about it?*
ii. *What types of information has your child shared about this program?*
iii. *What do you think are some of the benefits of the school offering this program?*
iv. *Do you have thoughts on how it can be improved?*

C. Closing

Well, that brings us to the end of all my questions. If you could just give me a few minutes to make sure we have everything ready for you.

Moderator checks with note taker to see if they have additional questions or comments. Check to make sure the demographic surveys have been collected.

Thank you for sharing your time and providing such valuable information. Our study team is extremely grateful for your participation in this study. Before I leave, is there anything else you would like to share with us today? Are there any questions you would like to ask us?

I have left you with my name and the study team's contact information. If you think of something later that you would like to add to what was discussed today OR if you have a question that you'd like to ask us, please feel free to contact us. Your name will not be connected with any answers or comments you have given today or may give in the future.

As a gesture of our appreciation for your participation, you will all receive a $10 Walmart gift card. Thank you so much again!

Turn off tape recorder.