

INFLUENCE OF NATIONAL SCHOOL LUNCH PROGRAM TO CHILDREN'S FOOD
PREFERENCE, AND CHILDREN'S INFLUENCE IN FAMILY PURCHASE

By

YUAN JIANG

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To my Mom and Dad

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Abstract of Thesis Presented to the Graduate School
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By

Yuan Jiang

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Co-chair: Zhifeng Gao

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The National School Lunch Program is the second-largest government food-assistance program in the United States. Over 80% of all primary and secondary schools participate in the NSLP. Given this influence, it is an interesting question to investigate the effects of school meals on children's food preferences. In addition, considering that children have an impact on family's purchasing decisions as they directly and indirectly influence their parent's decision-making; a secondary goal of this study is to explore how children influence the family's grocery shopping. Data for this research was collected using a survey completed by school children and their parents. A convenience sample of one hundred and sixty-three matched pairs of 4th and 5th graders and their parents was collected. Results showed that although the school meal is consumed frequently, the quality is not as rated as high as home foods. Other responses indicate children play an important role in the family purchase decision, and the different children's resource—children's contribution towards housework, grade and their knowledge has a significant correlation with the degree of children's influence.

CHAPTER 1 INTRODUCTION

Study Background

Good nutrition during childhood plays a key role in ensuring adequate growth, preventing the long-term risk of obesity and other chronic diseases, and enhancing overall health and well-being (USDA/HHS 2010). Since food habits are still developing during childhood, it is meaningful to help children adopt healthy eating habits in order to improve longer-term health outcomes. Although individual factors such as gender and age play an important role, and parental influence exists, there is an increasing understanding that children's eating habits are influenced by environmental factors, both in the home and at school.

As many children spend most of their time at school during the weekdays, and on average obtain one-third of their daily caloric intake from food consumed at school (Briefel et al. 2009), schools are a natural place to provide nutrition education or implement policies to help children to improve healthy eating habits. Federal, state and local school nutrition programs can influence the foods provided to students in school. In this sense, the School Meal Program of U.S. Department of Agriculture (USDA), including both the National School Lunch Program (NSLP) and the School Breakfast Program (SBP) serve a very important role in developing children's food and eating habits.

In 1946, the National School Lunch Program (NSLP) was established with the dual-goal of reducing government commodity surpluses while providing nutritious meals to low-income children (Ralston et al., 2008) to help reduce the malnutrition problem. The NSLP was designed to reduce malnutrition by providing meals whose nutritive contents met at least one-third of the child's nutritional requirements for the day to help insure a healthy and balanced diet. At the same time, through Federal, State and local support, the price of the meal was set at a low level.

Over time, the NSLP has become the second- largest government food-assistance program in the United States with the primary objective to “safeguard the health and well-being of the Nation’s children.” (USDA/HHS 2010) Over 80% of all primary and secondary schools participate in the NSLP. The current program provides free and reduced-cost lunches for income-eligible students, as well as subsidizing paid lunches for students whose families meet somewhat higher income eligibility requirements. Similar to NSLP, the SBP was designed to provide children easy access to a healthy and well-balanced breakfast on school days. Given the reach of these programs, it is an interesting question to investigate the effects of school meals on children's food preferences. Given the reach of these programs, measuring the effects of school meals on children’s food preferences is an important research question.

If the NSLP and SBP influence children’s food preference, an additional question is how this carries over to household food consumption. Children’s role in the U.S. market has increased: over a twenty year period from the 1960s to the end of 1980s, spending of children as consumers in the U.S. market increased from \$2billion to \$6billion and their influence extended to a staggering \$132billion of household expenditure (McNeal, 1992). This trend continued with an increasingly prosperous teenage market in the 1980s, despite declining of the population of teenagers by 15.5%.By the end of the 1990s, it was estimated that children in the United States accounted for \$23billion in direct spending, and their indirect spending had increased to a further \$188billion in family purchases (McNeal, 1999). Thus it is important to understand the power of children in the market, and the children’s direct and indirect influence on family purchases.

Purpose and Aim of the Study

The goal of this research is to explore whether school meals change children's food preference, and lead to choosing healthier options outside of the school environment. In addition, considering that children have an impact on family's purchasing decisions as they directly and

indirectly influence their parent's decision-making, and that children's preference and shopping behaviors influence present and future consumption trends; a secondary goal of this study is to explore how children influence the family's grocery shopping, and whether or not participation in the NSLP influences parents food shopping behaviors.

CHAPTER 2 LITERATURE REVIEW

The purpose of this chapter is to review prior articles related to the topical areas of the National School Lunch Program (NSLP), children's food preferences, and children's influence towards family decision making. This chapter will be divided into three parts, starting with the research on children's food preferences, followed by the previous studies on National School Lunch Program (NSLP), and finally children's influence on family decision making.

Factors Influencing Children's Food Preference

Factors that influence children's food preference have been investigated frequently in previous research. Three factors have been identified as influencing children's food preference: Individual, Social and Economic Factors.

Individual Factors

Individual factors refer to age, gender, nutrition knowledge, food taste. Aranceta et al (2003) analyze the food preference and eating habits of Spanish children and adolescents, and their relationship to sociodemographic factors, using a random sample of the Spanish population aged 2-24 years. Information was collected by trained dietitians during personal interviews with each participant and their mother or other guardian responsible for feeding the children for those less than 8 years old. They assess food consumption by means of a 24 hour recall. Their results indicate that there is difference in preference for specific food items among different age groups.

Nu, Macleod, Barthelemy (1996) conducted a research on French children and adolescents ages 10-20. They asked respondents to generate a maximum of ten liked and ten disliked foods and to recall at what age their food preferences had changed. The results show that most participants thought changes had occurred at the age of 10, and the ages of 12 and 15 seem also important as well. Thus it is concluded that there is a significant effect of age on the change

of children's food preference. On the whole sample, the age effect also exists: negative changes take place sooner (mean age = 10), whereas positive changes take place later (mean age = 11). Thus children are more likely to begin to dislike a food they liked previously before puberty; and after puberty, they are more likely to begin to like a food they disliked before. However, as the data collection relied on memory, interpretation of the age differences should be considered with caution.

Skinner, Carruth, and Bounds (2002) compared food preferences longitudinally to identify factors related to food preferences. They collected data by questionnaires completed by mothers for their children at 2-3 years of age, 4 years old and 8 years old, and also for mothers themselves, whose children are 2-3 years old, and 8 years old. Children who were 8 years old were also asked to finish abbreviated food preference questionnaires. The result shows that few positive changes occurred in children's food preferences during the 5-to 5.7- year period, although the number of foods disliked increased. The summary of these studies suggests that age plays a role in children's food preference.

Another individual factor that may affect food preferences is gender. Previous research concerning differences in food preference based on gender has not shown consistent findings. Lytle and Seifert (1999) used 24-hour recall to investigate children's food choice and dietary behaviors, and compared them across grades and other sociodemographic factors. Their findings suggest boys and girls had similar developmental trends in consumption and eating preferences. Aranceta et al (2003) found a similar result, with differences in food preferences in their sample of children and adolescents in Spain based on gender. However, in 2001, Wardle, Sanderson and Gilbson found that among 4-5 year old British children, girls preferred vegetables more than boys did. Additionally, Reynolds et al (1999) found that American boys are reported to consume

less fruit and raw vegetables than girls. And Caine and Scheule (2008) had the similar result that there was a difference in food preferences between genders, and this difference varied among elementary school, middle school and high school. Boys preferred the meat fish and poultry foods over girls, and girls preferred fruits and vegetables. These conflicting results suggest that the role of gender in children's food preference needs further study.

Another individual factor that has been investigated regarding children's food preferences is nutrition knowledge. Pirouznia (2001) argued that children were not mature enough to connect nutrition knowledge and food selection. However, Morgan and Warren (2009) found that school garden-enhanced nutrition education did encourage more children to taste fruits and vegetables.

Besides, food taste also works as an important factor influencing children's food selection. French et al (1998) assessed motivations for vending snack choices and found that adolescents rated snack taste as the most important factor to consider, followed by hunger and price. And in the study constructed by Susan Barr (1994), it was concluded that taste enjoyment has a significant relationship with the calcium intake for adolescent children.

Economic Factors

Economic factors also may influence children's eating behaviors and habits. Income and food prices have become an important consideration in food choice. Drenowski and Darnen (2005) concluded that people usually make selection of foods, like energy-dense grains, fats, and sweets, which are higher in sugar and fat, because such foods are usually among the lowest-cost dietary options.

Education status of parents has also been associated with children's food intake quality. Guillaume and Lapidus (1998) argued that lower educational status of parents has been associated with lower dietary quality, including higher fat and lower micronutrient intake in children. Employment also was correlated with diet quality. Maternal employment was found to

be negatively associated with the frequency of family meals, which are, in turn, positively associated with diet quality. Wolfe and Campbell (1993) concluded that children with mothers employed outside had less diverse diets than those with mothers at home.

Social Factors

Social factors that influence children's food preferences include family factors, peer influence, school environment and market and media environment.

Family factors, according to the research of Nicklas et al (2001), include food exposure and availability, parental modeling, parenting style, and food socialization practices. The more fruit and vegetables available at home, the larger consumption of fresh fruit and vegetables were reported. And the result is similar in the research constructed by Hearn et al (1998), which claimed that the availability and accessibility of fruits and vegetables enable consumption when controlling for other socioeconomic status and psychosocial characteristics.

Young and Fors (2001) also found that the parental situation influenced children's food preference. They found that the percentage of children who usually ate healthy foods decreased as the parental situation changed from a two-parent, to a single parent, to other family members, to a foster family.

Parental modeling was also examined, and Fisher et al (2002) indicated in their research that parents' own fruit and vegetable intake would encourage fruit and vegetable intake in their children, leading to higher micronutrient intakes and lower dietary fat intakes. Parents' attitudes and knowledge about nutrition have also been correlated with children's healthy eating; Contento et al (1993) found that parents' nutritional knowledge affected the nutritional level of foods the family purchased, and therefore the availability of healthy foods, as well as the size of portions of healthy foods served to the children.

Peers have an important and lasting influence on the food preferences of children. Hendy and Raudenbush (2000) investigated the effect of school environment, including teachers' modeling and peer effect on children's willingness to taste new foods. And from this research, peer modeling has been found to be the strongest predictor of younger children to try some new foods. French et al (1998) examined 13 different motivations regarding snack selections among 419 adolescents, and they found that the influence of friends was significant.

Marketing and mass media are also considered to be an influencer on children's food preference and food purchases. Marquis and Dagenais (2002) investigated the relationship between the frequency of consumption of specific foods and TV watching. Food advertising was found to significantly promote increased consumption of some specific food items, and this research further discussed that food or beverage commercial advertisements often contained misleading information, which might lead to confusion among children.

School environment and school policies can also influence children's healthy eating and food selection. Hanks, Just, and Wansink (2012) argued that the consumption of "competitive foods" (food or beverage sold to students outside the School Meals Program, like vending machines, a la carte sales and school stores), decrease students' intake of healthy foods, while increasing the intake of total fat and sugar. It was also reported by Ishdorj, Crepinsek and Jensen (2012) that the School Lunch Program and School Breakfast Program lead to increased consumption of both fruit and vegetables in schools.

Children's Influence on Family Decision Making

Family decision making has an important role in consumption decision making in the market. Thus, there have been numerous research studies in the area of the process of family decision making. However, in the early years, most researchers tended to focus on the influence

of husband and wife in the family decision making, and overlooked the role of children in the decision process.

The first research trying to analyze the influences of children on family decision making dates back to Berry and Pollay (1968). They chose the independent variables as the children's assertiveness, mother's children-centeredness, and mother's brand recall, and concluded that the more the mother is child-centered, the less the mother would agree to buy the foods children liked, and instead they would buy foods that were healthy for their children. Since then, children have been researched and recognized as having an influential role on the process of family decision making.

In the 1990s, research indicated the increasingly important role of children during family decision making. According to the report of McNeal (1992), children spent more than \$132 billion on 62 product categories, and approximately 17% of family purchases were influenced by the children in the United States. And in the late 1990s, McNeal (1998) indicated that the influence has increased to around \$188 billion directly, and \$300 billion indirectly. And the research by Laczniaak and Palan (2004) on children aged from 3-11 years old and found that when shopping together with parents, children would be asked for a purchase every two minutes on average.

Thus, the power of children in the process of family purchase decision-making has increasingly aroused the interests of researchers, marketers and manufacturers. And based on the previous studies, children's influence varies based on a number of different factors, including product types, decision stage, children's characteristics, family characteristics, and socio-economic factors

Product Types

One important factor is product type. According to the previous research, generally, it is indicated that children have more influence on the product for their own use than product for the whole family. (Foxman and Tansuhaj, 1988) More recently, Shoham and Dalaka (2005) claimed that children have the greatest influence on the purchase of magazines, children's dress and records/CDs. And as for the leisure time activity, children are also influential in decision-making processes, because such activities are often child-focused (Labrecque, Ricard, 1999).

In contrast, children had less influence on the products that was used by the entire family; especially the products with high price (Foxman et al, 1989b). Foxman et al., (1989b)'s research indicated that children had little involvement in the purchase of cars, furniture, televisions and life insurance. It is easy to understand that parents' are more responsible for the purchase of household goods which involve higher financial risks (Belch et al., 1985).

Decision Stage

Another significant factor influencing the power of children in the family consumption is decision stage. According to various research studies, including the study conducted by Beatty and Talpade, children have larger influence in the early stage of the decision making process (Beatty and Talpade, 1994).

Yet, there is also existing contrary evidence, from the research conducted by Lee and Beatty in New Zealand (Lee and Beatty, 2002), which concluded that children were highly involved in both the earlier stages and final stages of the decision process. This may be caused by the increasing influence of children on the family purchase in recent years.

Children's Characteristics

Recently, more and more researchers like Foxman (1989a), Beatty and Talpade (1994), and Belch et al, (2005) have paid attention to the relationship between children's characteristics

and the power of children in the family decision making process. From the resource theory, developed by Blood and Wolf in 1960, which mainly explain the influence husband and wife in the family purchase, it is shown that in the decision making process, the family member who contributes more resources has larger influence on the decision making. And, grounded on this theory, many researchers indicated that children's individual resources would influence their influence in the process of family decision-making.

Foxman et al (1989) examined the relationship between children's resources and their power in the family decision making. In this study, they chose children's income contribution, employment, grade and the perception of parental love and confidence as independent variables, and chose the product influence as the dependent variables. And it concluded that children's personal resources have a positive relationship to their influence on the family decision making process. Also among all the independent variables, grade had the largest influence towards the decision process.

Secondly, considering the income contribution, Moschis and Mithchell (1986) indicated in their research that children's earning and employment status has a positive relationship with children's power at home. And then, Beatty and Talpade (1994) replicated Foxman et al (1989)'s study using a wider range of products both for children's purchase and for family purchase, with the aim of generating more robust results; their results suggested that Finally, product knowledge is also considered as a resource of children which has positive influence on children's power in the process of family purchases. According to Foxman's research (1989), product knowledge has marginally significant effect on children's choice of product, but only had influence on some products used by children themselves. Furthermore, research conducted by Beatty and Talpade (1994), indicated that product knowledge did not affect children's influence, except in the first

stage, initiating the idea to purchase the item. And for those products used by the whole family, children did not affect the decision making process. Also, Thomson (2007), found that knowledge and information were important resources that can effectively affect children's influence over the purchase decision.

Family Characteristics

In addition to the various aforementioned factors, changes in family structure also can significantly impact the level of children's influence on family decision making. Many researchers have claimed that the increasing divorce rate has dramatically altered the traditional family structure, and that single parent families or blended families, may change the dynamic of children's influence on family decision making. Numerous researchers indicated that children in single parent families were more involved in the family purchase decision than children from ordinary families. In the study conducted by Taylor et al.,(1985) found that children from single parent families tend to have greater influence on food purchase, and had more participation on the choice of foods. One reason explaining this may be that single-parent may not have enough time to make food purchase decisions, thus children had to take more responsibility for the family decision making on food purchases.

Secondly, in the previous research, many researchers claimed that children from higher income families would have more influence on the family purchase. Jenkins (1979) found that children's influence would increase with the income of the family. And, in the research constructed by Moschis and Mitchell (1986), they argued that children's influence would be larger in family with higher socio-economic status. It may be because higher-income families may provide more opportunities to their children on the choice of products, and then be more likely to accept children's input. Besides, it was also showed by the study of Breatty and Talpade

(1994) that children in the dual-income family would have greater influence on family purchase decisions.

Parents' Characteristics

There is little research examining the relationship between parents' characteristics with children's influence during family shopping. Berey and Pollay (1968) found that mothers who are child-centered would be less inclined to buy the cereal that children liked, because mothers who care more about their children would pay more attention to the nutritional content of foods, thus it may lead to fewer purchases of the foods that children liked. Another study conducted by Roberts et al (1981) found that the more conservative and traditional the mother, the less children influenced family purchase decisions.

CHAPTER 3 DATA

This chapter first introduces the process of gathering information about the influence of the National School Lunch Program on children's food preference, as well as the degree of children's influence on family purchases. Then, it will provide the descriptive analysis of the variables used in this study.

Methodology

A mail survey was delivered to parents of 4th and 5th graders in one county through the school system. Because the research includes two aspects (the NSLP's effects on children's food preference, and on parents' grocery shopping), the survey was designed with two parts: one for parents to complete and the other for children. Children from 4th or 5th grade were chosen because they were more likely than younger children to be actively engaged in family grocery shopping, they may be better able to express their opinions regarding foods, and they had a higher ability to complete the questionnaire. Elementary school children were selected as opposed to middle or high school students due to the rates of participation in school lunch, increased food options (non-NSLP foods) at schools for older children, and because their preferences may not be as set as older children.

Surveys were sent home with approximately 1,000 4th and 5th graders across 7 schools with varying levels of participation in the school lunch program. A pre-paid envelope was included for participants to return the survey. In total, 172 respondents returned completed surveys, for a completion rate of 15%. However, 15 returned surveys had incomplete responses and were not included in this analysis. The remaining 163 responses are both completed by parents in the first part, and children in the second part.

There are 32 questions, which are divided into two parts: the first part is developed for parents, and the second part is for children. In each part, it can be further divided into four groups to investigate: 1) demographics; 2) knowledge and preferences towards school meals; 3) shopping habits; and 4) children's characteristics.

Descriptive Statistics

The questionnaire was sent to seven elementary schools in Alachua County, Florida. The seven elementary schools can be divided into three groups: 1) high percentage of participants in the National School Lunch Program (NSLP); 2) medium percentage of participants in the NSLP; and 3) low percentage of participants in the NSLP. In total, 1,000 surveys were sent to the 4th and 5th graders in the seven elementary schools, and 172 were returned. Deleting 15 of the returned surveys with incomplete responses, 163 completed surveys were used in this analysis.

Demographics

Demographic information was collected with the hope to determine if these factors could affect the amount of children's influence in family purchase. For parents, females accounted for 90% of the respondents (Table 3-1). Gender of children was more evenly spread, with 59% girls, and 41% boys (Table 3-2). Most (93.7%) parents in the sample were more than thirty years old, with the most common age range of 36-40 years old (26.38%) (Figure 3-1). Given the 4th and 5th grade target, it is not surprising that 82.21% of children were ages 10 and 11. More than 70% of the children come from a dual-parent family, while approximately 22.09% have a family with a single parent, either separated, divorced, widowed or never married (Table 3-3). From the education aspect, approximately 50% of the participants have a four-year college degree or higher. Very few people (10%) had a high school diploma or lower (Table 3-4). Most of the participants had an annual household income in the range from \$50,000 to \$ 75,000. Participants with an annual household income less than \$35,000 accounted for about 26% of respondents and

participants with a household income more than \$149,000 made up about 6% of the total participants (Figure 3-2). Most (85%) of the participants had more than one child in their house, with 30% of families with three or more children. Only 15% of the participants had one child (Table 3-5).

Preference and Knowledge of School Meals

In order to understand children's preference towards school meals, parents were at first asked to indicate the frequency of their children having school lunch and home lunch; school breakfast, and home breakfast. In the sample, approximately 36.4% of all the parents indicated their children had school lunch every day, while there was 24% that never had school lunch. Compared to school lunch, school breakfast is less popular. Only 12.3% of the respondents indicated that their child had school breakfast every day, and 63.6% reported never having school breakfast (Figure 3-3). Parents were asked to report if their child was eligible for the National School Lunch Program (they were reminded the prices of a full-price, reduced-price, and free lunch to help with the definitions). According to the respondents, 38% qualify for free or reduced fee lunches (Table 3-6).

Children were asked to indicate how much they liked school lunch and home lunch on a 5-point scale (indicated with smiley faces). Children indicated they preferred home lunch to school lunch, with a mean score of 1.44 for home lunch (1 being the best), and 2.97 for school lunch (3 being neutral). Only 9.82% of children indicated that they liked the school lunch very much, and another 13.5% report never having school lunch. Over half of the children (55.83%) gave lunch brought from home highest score, and 19.02% never have lunch packed from home. As for school breakfast, 10.56% of children gave the school breakfast the best rating, but 60.25% never have school breakfast. On the other hand, 70.37% like the home breakfast best, with only 3.09% never having home breakfast (Table 3-7).

Next, children were asked to identify how much they liked 12 different foods commonly included in school lunch and likely eaten at home. In all cases, on average, foods consumed at home were preferred to foods consumed at school, with the smallest difference in means of 0.24 for French Toast Sticks and the largest of 1.23 for steamed broccoli (Figures 3-4 and 3-5).

Family Characteristics

Nowadays, children are playing an increasingly important role in family's purchasing decisions. In order to find out factors that influence the amount of children's influence, some characteristics of the family were examined, including family shopping habits, and the level of nutrition knowledge. To better understand family shopping habits, parents were asked to report how often their children came to the grocery store with them. Approximately 70% reported their children came grocery shopping more than frequently (Table 3-8). Nearly all (96%) of the parents thought that they would agree to buy an item that their children wanted during shopping more than occasionally, and 7% would agree to buy the foods all of the time (Table 3-9). When asking about nutrition, most of the parents (98%) would consider their knowledge of nutrition would be better than a letter grade of C (A is the best) (Table 3-10).

Children's Characteristics

Finally the children were asked about their shopping habits, their contribution to housework, and their efforts related to studying, which may be important factors affecting the power of children in family shopping.

Approximately 74% of children would ask their parents to buy something they like during shopping. Considering the answer in the parent's parts, more than 96% of the parents thought that they would agree to buy the foods that their children wanted during grocery shopping more than occasionally. It demonstrates that children are playing a very important role in family grocery shopping.

The frequency of doing housework (including house cleaning, making bed, cleaning dishes, and doing laundry) was asked, to calculate children's contributions towards housework. More than half (64%) of children thought that they did house cleaning more than occasionally, and 22.07% of children indicated they made their bed every day. As for helping with the dishes, 43% of children reported that they helped at least 1-2 times each week. Nearly half (42%) indicated they did laundry more than 1-2 times a week. Almost all (85.89%) indicated that they did homework every day, and 11.04% thought they did homework about 4-5 times a week (Table 3-11).

Table 3-1. Gender of parents

Gender	Frequency	Percent
Female	147	90.18
Male	16	9.82

Table 3-2. Gender of children

Gender	Frequency	Percent
Girl	91	55.83
Boy	72	44.17

Table 3-3. Marital status of parents

Marital	Frequency	Percent
Never married	11	6.75
Married	116	71.17
Living with partner	7	4.29
Separated	3	1.84
Widowed	3	1.84
Divorced	19	11.66
Other	2	1.23
Refused to answer	2	1.23

Table 3-4. Education level of parents

Education	Frequency	Percent
Less than high school diploma	6	3.68
High school diploma or equivalent (G.E.D.)	10	6.13
Some college (AA degree or courses without a final degree)	67	41.10
Bachelor's Degree	31	19.02
Post-graduate or Professional Degree	49	30.06

Table 3-5. Number of children in the family

Number of children in family	Frequency	Percent
1	25	15.34
2	87	53.37
3	28	17.18
4	16	9.82
5	4	2.45
6	3	1.84

Table 3-6. Eligibility for school meals

Meals	Frequency	Percent
Free lunch	49	30.06
Reduced-price meals	11	6.75
Regular school lunch (\$2.15)	98	60.12
Do not know	5	3.07

Table 3-7. Preference towards school meals and home meals

						I never have this
School Lunch	16 (9.82%)	40 (24.54%)	44 (26.99%)	17 (10.43%)	24 (14.72%)	22 (13.50%)
Lunch you bring from home	91 (55.83%)	31 (19.02%)	8 (4.91%)	1 (0.06%)	1 (0.06%)	31 (19.02%)
School breakfast	17 (10.56%)	17 (10.56%)	8 (4.91%)	9 (5.59%)	13 (8.07%)	97 (60.25%)
Breakfast I have at home	120 (70.37%)	33 (20.37%)	8 (4.91%)	1 (0.06%)	1 (0.06%)	5 (3.09%)

Table 3-8. Frequency of children going grocery shopping with parents

Frequency of children going grocery shopping with parents	Frequency	Percent
Never	0	0
Rarely	7	4
Occasionally	42	26
Frequently	73	45
All of the time	41	25

Table 3-9. Frequency of parents agreeing to buy items at the grocery store if child asks for something

Frequency of parents agreeing to buy	Frequency	Percent
Never	0	0
Rarely	5	3
Occasionally	71	44
Frequently	76	47
All of the time	10	6

Table 3-10. Self-reported grade of parents' knowledge of nutrition

Grade of knowledge of nutrition	Frequency	Percent
A	57	35
B	75	46
C	25	17
D	3	2
E	0	0
F	0	0

Table 3-11. Frequency of doing housework as reported by the children

Type of work	Never	Not much	About 1-2 times a week	About 4-5 times a week	Everyday
Clean the house	10 (6.13%)	48 (29.45%)	69 (42.33%)	17 (10.43%)	19 (11.66%)
Make the bed	20 (12.27%)	44 (26.99%)	35 (21.47%)	27 (16.56%)	37 (22.70%)
Wash dishes	37 (22.84%)	55 (33.95%)	35 (21.60%)	20 (12.35%)	15 (9.26%)
Do laundry	44 (26.99%)	49 (30.06%)	53 (32.2%)	8 (4.91%)	9 (5.52%)
Do homework	0 (0)	2 (1.23%)	3 (1.84%)	18 (11.04%)	140 (85.89%)

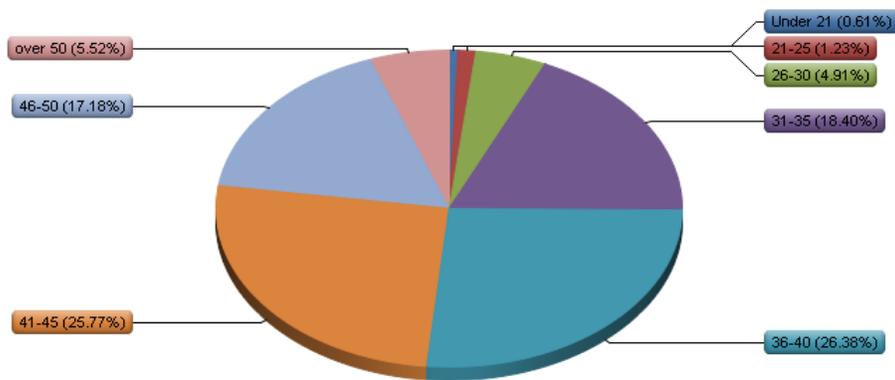


Figure 3-1. Age distribution of parents

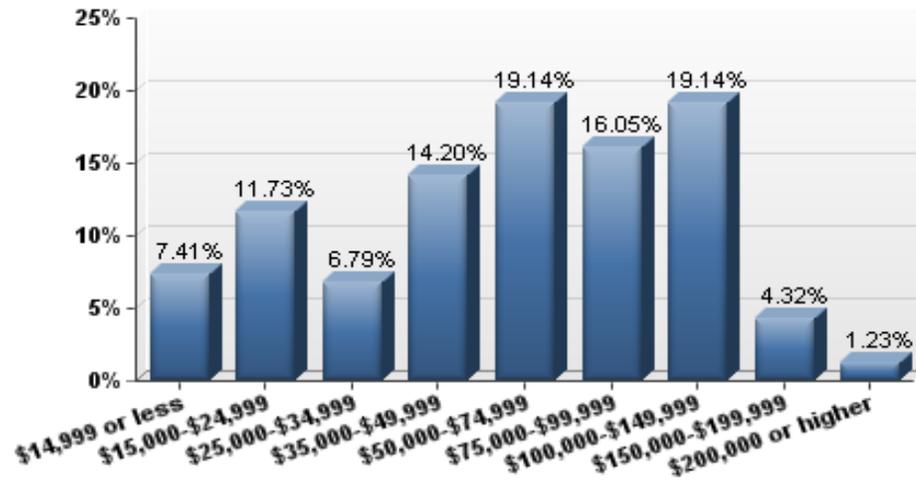


Figure 3-2. Distribution of annual household income

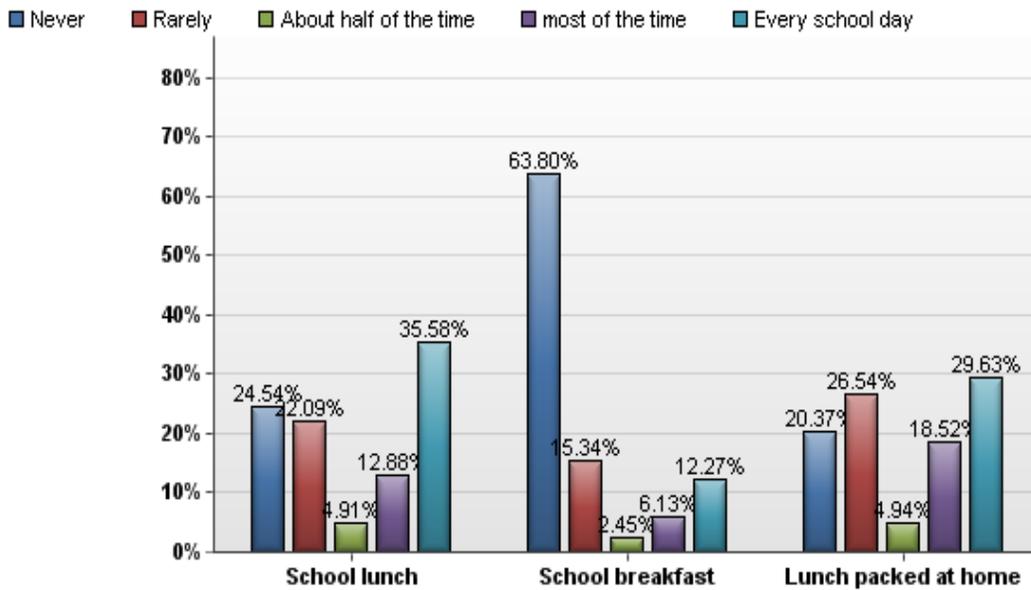


Figure 3-3. Frequency of having school meals

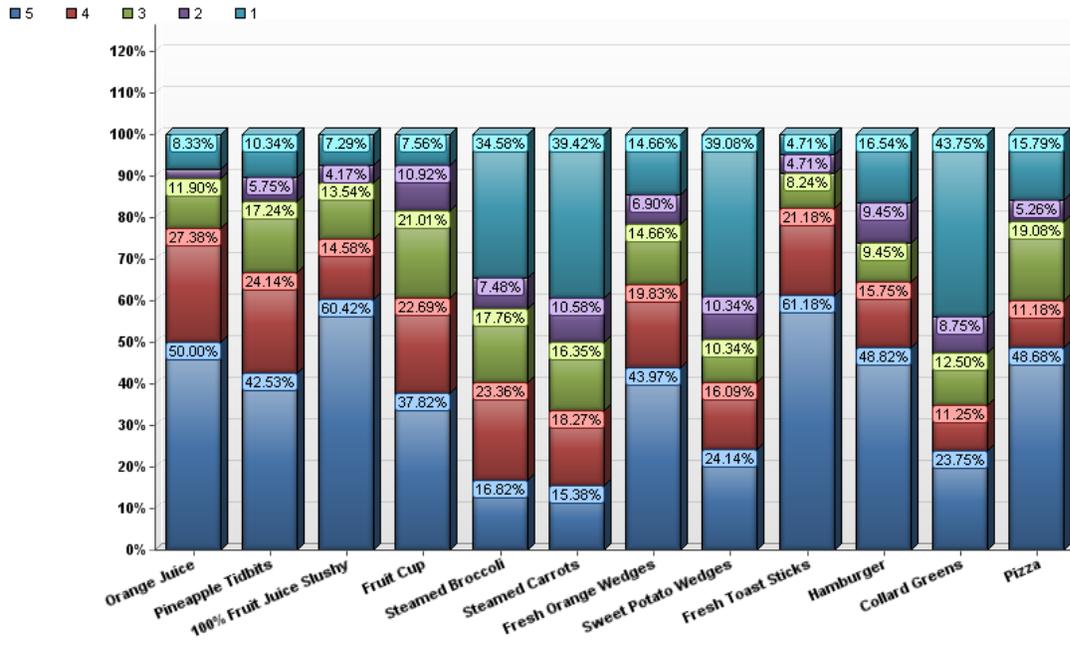


Figure 3-4. Preference towards foods in school meals

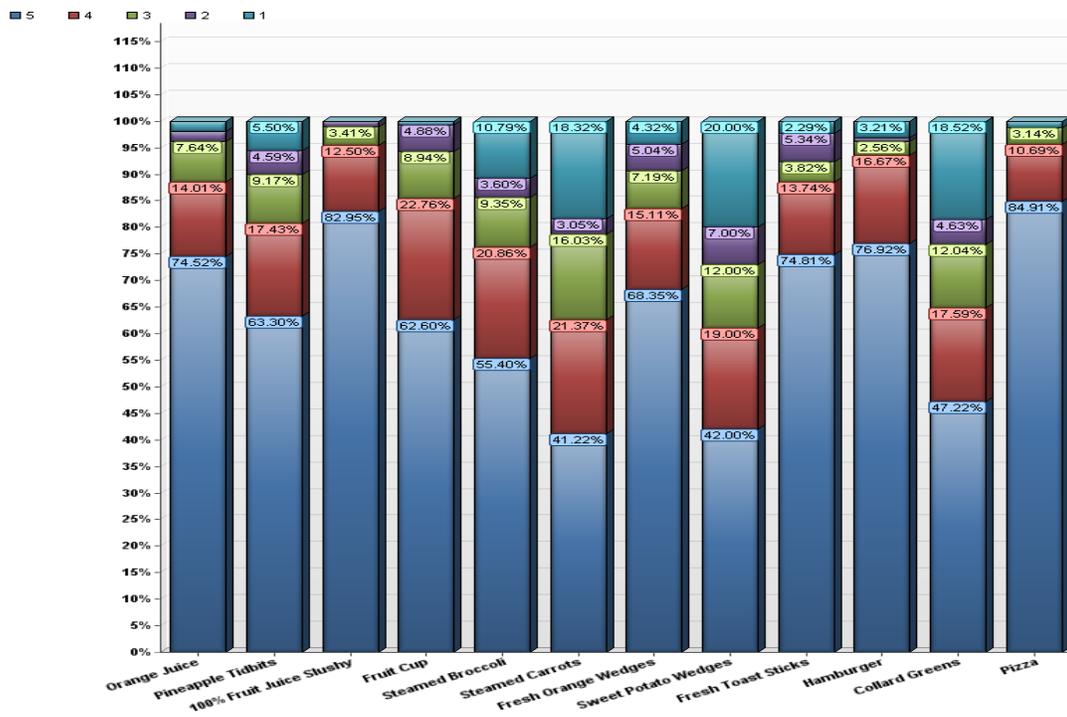


Figure 3-5. Preference towards foods at home

CHAPTER 4 INFLUENCE OF NATIONAL SCHOOL PROGRAM TO CHILDREN'S FOOD PREFERENCE

The aim of this chapter is to analyze data from the survey responses. The initial portion will provide an overview of the data using frequency analysis. The next portion will show the analysis of the influence of the National School Lunch Program by testing three hypotheses about the NSLP.

General Data Overview

In total, 170 responses were collected; however 15 were rejected due to incomplete responses. The valid 163 responses are both completed by parents in the first part, and children in the second part.

As expected, even though only 38% of respondents qualify for free or reduced fee lunches, more children ate school lunch (defined as the School Lunch encephorth, home lunch will refer to lunches consumed at school but packed at home). In total, 36.2% of the respondents had School Lunch every day, 17.8% of ate School Lunch more than half of the time, and 22.3% ate School Lunch some of the time. Only 23.7% of respondent reported never eating School Lunch. School Breakfast is less popular, with only 12.3% of respondents reporting eating it every day, and 63.8% indicating that they never have School Breakfast.

Children were asked to indicate how much they liked school lunch and home lunch on a 5-point scale. Children indicated they preferred home lunch to school lunch, with a mean score of 1.43 for home lunch (1 being the best) and 3.12 for school lunch (3 being neutral). Children were also asked to identify how much they liked 12 different foods commonly included in school lunch and likely eaten at home. In all cases, on average, foods consumed at home were preferred to foods consumed at school, with the smallest difference in means of 0.24 for French Toast Sticks and the largest of 1.23 for steamed broccoli. This indicates that although there are many

students participating in the NSLP, most children are not as satisfied with the quality of school meals compared to home.

When children were asked if they ever talked about the foods from school lunch at home, answers ranged from 76.3% for pizza to 24.3% for pineapple tidbits. Parents were also asked if their children ever talked about school lunch at home (in general, not for specific foods like the children) and 92.4% indicated their children talked about school foods at least sometimes, though 42.1% indicated it was rare.

What is more, when considering the reason why the children hope to buy certain foods, the most important reason children indicate is because they tried it with a friend (51%), saw a commercial (46%), or because the packaging attracted them (42%). Though lower in priority, 32% indicated they asked for something because they tried it at school. In addition to asking children why they want to purchase certain foods, parents were asked if they knew why their children asked for foods at the store. Parents most often attribute the requests to packaging (54%) and commercials (54%), and only mention school lunch 17% of the time (though 13% of parents indicating they do not know the reason the child asks). Though not a major reason, it does appear that school meals do affect children's food preference and family grocery consumption.

Hypothesis Testing

In order to investigate the National School Lunch Program, perceived quality differences between School Meals and home meals is tested. To achieve this goal, matched pairs T-test will be used.

H1: Children Prefer Home Meals More than School Meals. To determine if children prefer home meals to school meals, mean ratings for both types of lunch were compared for respondents who reported having both school and home lunches (53 respondents who never tried School Lunch or lunch brought from home were removed from this test).

Among the participating children, 24.54% never had school lunch, and 20.37% of them never had lunch packed from home. Among those who had both, 6.36% prefer school lunch more than home lunch, 8.18% rank the lunches same and 85.46% thought home lunch was better than school lunch (Table 4-2). For breakfast, 60.25% of responding students never had school breakfast, while 3.09% report never having breakfast at home. Among those students who both had school and home breakfast, 8.06% would prefer school breakfast over home breakfast, 67.74% had ranked the home breakfast higher, and 24.19% thought the two were the same quality.

The paired t-test indicates the mean values (3.12 for school lunch and 1.43 for home lunch) is different at the 95% confidence level (Table 4-4), with students preferring lunch from home to the School Lunch Program food. Similarly, deleting 101 responders who report never having School Breakfast or home breakfast, the mean score of School Breakfast is 2.84, while the score for home breakfast is 1.30 (Table 4-5). This difference is also significant at the 95% confidence level, with children preferring home breakfast to school breakfast. Results from these two tests indicate the quality of school meals may be an issue as students significantly prefer home meals to school meals.

H2: For each category of foods, children prefer home foods to school foods. Children were also asked to identify how much they liked twelve different foods commonly included in school lunch and likely eaten at home. Paired t-tests were used to test each food. Output from SAS is shown in table 4-5.

In all twelve cases, children reported significantly preferring the foods eaten at home. The largest difference was found for pizza followed by hamburgers and the smallest difference is french toast sticks.

H3: There is transition existing between children’s preference towards the School Meals and Home Meals. In addition to investigating whether or not children prefer home foods to school lunch foods, it is of interest if the ratings are related. Given the small sample size, a chi-square test is not appropriate, so Fisher’s exact test was used for the test. Results are shown in Tables 4-6.

Results indicate there is significant correlation between children’s preferences towards ten of the twelve foods provided at school and eaten at home, indicating there may exist significant relationships between the preferences of school and home foods. The two foods that did not show correlation were pizza and hamburgers, which were also the two foods with the largest difference in means. This indicates the difference in quality for these foods may be very significant.

Table 4-1. Difference of children’s preference towards home lunch and school lunch.

Difference in Children’s preference	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Rank home lunch lower than school lunch	7	6.36	7	6.36
Rank home lunch higher and school lunch the same	9	8.18	16	14.55
Rank home lunch higher than school lunch	94	85.45	110	100.00

Table 4-2. Difference of children's preference towards home breakfast and school breakfast.

Difference in Children's preference	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Rank home breakfast lower than school breakfast	5	8.06	5	8.06
Rank home breakfast lower and school breakfast the same	15	24.19	20	32.26
Rank home breakfast higher than school breakfast	42	67.74	62	100.00

Table 4-3. Children's preference towards school meals and home meals: one-sample statistics

Meals	N	Means	Std Dev	Std Err
School Lunch	110	3.1182	1.1710	0.1116
Lunch Packed from Home	110	1.4364	0.7361	0.0702
School Breakfast	62	2.8387	1.5278	0.1940
Home Breakfast	62	1.3065	0.6675	0.0848

1="like it very much"; 3="Neutral"; 5="Do not like it at all"

Table 4-4. Children's preference towards school meals and home meals: Matched Paired T-test

	t	df	Sig.	Mean Difference	95% CL Means lower	95% CL Means upper
Difference between school lunch than home lunch	12.65	109	<0.001	1.6818	1.4184	1.9453
Difference between school breakfast than home breakfast	6.96	61	<0.001	1.5323	1.0919	1.7341

Table 4-5. Children's preference towards school and home food: matched paired T-test

Difference between home and school:	t	df	Sig.	Mean Difference
Orange juice	-2.55	83	0.0128	-0.1786
Greens	-5.73	72	<.0001	-0.5479
Fruit cup	-4.90	93	<.0001	-0.3838
Fruit juice slushy	-3.73	67	0.0004	-0.2836
Fresh orange wedges	-4.39	107	<.0001	-0.2710
French toast sticks	-1.47	69	0.1456	-0.1000
Hamburger	-6.46	124	<.0001	-0.5120
Pizza	-8.22	148	<.0001	-0.5503
Pineapple tidbits	-2.41	74	0.0185	-0.1733
Steamed broccoli	-7.07	103	<.0001	-0.6538
Steamed carrots	-6.08	90	<.0001	-0.5714
Sweet potato wedges	-2.95	62	0.0045	-0.3333

Table 4-6. Fishers test for foods eaten at home and at school

Food	Fisher's Exact Test Prob
Orange juice	0.0117
Greens	5.758E-08
French cup	0.0072
Juice slushy	0.0231
Orange wedges	6.786E-09
French toast sticks	2.140E-04
Hamburgers	0.2487
Pizza	0.1477
Pineapple tidbits	6.171E-06
Steamed broccoli	1.079E-04
Steamed carrots	2.453E-07
Sweet potato wedges	4.261E-07

CHAPTER 5 CHILDREN'S INFLUENCE TOWARDS FAMILY SHOPPING

This chapter will determine the significant factors that influence the children's impact on parents' shopping decisions. Previous research has demonstrated grades, children's knowledge of products, and their contribution to the housework are important factors that determine the children's impact on a family's decision making.

Model

Data were collected by mailed questionnaires, as described in the previous chapter. Variables including parents' demographics, children's characteristics, and family shopping habits were included in the model to determine the extent to which they influence children's impact on their parents' shopping decision.

Ordered Probit Model

An ordered probit model is used to estimate models whose dependent variables are ordinal, but not continuous in the sense that the metric used to code the variables is substantively meaningful (Simon Jackman, 2000). The ordered probit model is based on the central idea that there is a latent underlying index that is not observable by the analyst and is a continuous descriptor of the real responses. Thresholds partition the real line into a series of regions corresponding to various ordinal categories. In addition the random error associated with this continuous descriptor is assumed to be normal distributed.

The basic probit model is shown in Equation 5-1

$$Y_i^* = X_i\beta + \varepsilon_i \quad \varepsilon_i \sim N(0, 1) \quad (5-1)$$

where Y_i^* is a continuous variable which is a linear function of a set of dependent variables X_i . ε_i is the disturbance term that has a normal distribution. β is the vector of the regression coefficient to be estimated.

The relationship between Y_i^* and Y_i (for example Y_i can be 0,1,...,m) is shown in the following equations (Equation 5-2, 5-3, and 5-4):

$$Y_i = 0, \text{ if } Y_i^* \leq 0 \quad (5-2)$$

$$Y_i = 1, \text{ if } 0 < Y_i^* < \mu_1 \quad (5-3)$$

$$Y_i = m, \text{ if } \mu_{m-1} < Y_i^* < \mu_m \quad (5-4)$$

Where Y_i is the observed ordinal variable taking on values 0 through m, and μ s are unknown threshold parameters which are estimated with β .

To analyze children's influence on parents' purchase decision, we denote Y as parents' agreement/disagreement of statements regarding children's impacts on parents' purchase decision, such as

$Y_i=0$ if parents totally disagree with the statement that children have influence on their purchase decision.

$Y_i=1$ if parents disagree with statement that children have influence on their purchase decision. $Y_i=2$ if parents neither disagree nor agree with the statement that children have influence on their purchase decision.

$Y_i=3$ if parents agree with the statement that children have influence on their purchase decision.

$Y_i=4$ if parents totally agree with the statement that children have influence on their purchase decision.

Consider the probabilities of each ordinal outcome, the following equations can be written:

$$P [Y_i = 0] = P [\mu_{-1} < Y_i^* < \mu_0] = \phi (-\beta X') \quad (5-5)$$

$$P [Y_i = 1] = P [\mu_0 < Y_i^* < \mu_1] = \phi (\mu_1 - \beta X') - \phi (-\beta X') \quad (5-6)$$

$$P [Y_i = 2] = P [\mu_1 < Y_i^* < \mu_2] = \phi (\mu_2 - X_i \beta) - \phi (\mu_1 - \beta X_i') \quad (5-7)$$

$$P [Y_i = 3] = P [\mu_2 < Y_i^* < \mu_3] = \phi (\mu_3 - \beta X_i') - \phi (\mu_2 - \beta X_i') \quad (5-8)$$

$$P [Y_i = 4] = P [\mu_3 < Y_i^* < \mu_4] = \phi (\mu_4 - \beta X_i') - \phi (\mu_3 - \beta X_i') = 1 - \phi (\mu_3 - \beta X_i') \quad (5-9)$$

The marginal effects of the independent variables on the probabilities can be derived and they vary by individuals. The marginal effects depends on the values of all independent variables and are calculated as the follows (Equation 5-10):

$$\frac{\partial P [Y_i = j]}{\partial X} = [\phi (\mu_{j-1} - \beta X_i') - \phi (\mu_j - \beta X_i')] \times \beta \quad (5-10)$$

Typical marginal effects are calculated at the mean of the variable. However, in the case of dummy variables the mean is not relevant, and the difference of two resulting probabilities when the dummy variable equals 1 and 0 is used.

Model Specification

In the Ordered Probit Model the dependent variable for the model is the parents' agreement towards six statements describing children's influence (Table 5-1). Independent variables used in the model include demographics, family shopping habits, and children's characteristics (Table 5-2). SAS was used to estimate the model.

The specification of the Ordered Probit Model is:

$$Pa_study = f(\beta_0 + \beta_1 Pargender + \beta_2 Parage + \beta_3 Paredu + \beta_4 Marstatus + \beta_5 Nochild + \beta_6 Income + \beta_7 Nutrigrade + \beta_8 Chigender + \beta_9 Chiage + \beta_{10} fqhome + \beta_{11} fqhouse + \beta_{12} Freqshopchi + \beta_{13} Freqask + \beta_{14} Freqbuy)$$

Where Pa_study is the dependent variable, representing parents' agreements with the first statement listed in Table 5-1, which examines whether or not parents would agree to buy a learning tool, like an electronic device for reading or listening to books to help children with school.

The independent variables in the model can be divided into several groups. The first group is family characteristics and parents' demographics, including parents' gender (pargender),

age (parage), education level (paredu), marital status (marstatus), number of children in the family (nochild), income, and self-rated nutrition knowledge (nutrigrade). The second group concerns children's characteristics, which consists of children's gender (chigender), children's age (chiage), frequency of doing homework (fqhome), and frequency of doing housework (fqhouse). The frequency of doing housework is the sum of the reported frequency of doing laundry, washing dishes, making their bed, and helping to clean the house. The third group consists of three variables focusing on the interaction between children and parents regarding shopping behavior such as frequency of shopping with children (Freqshopchi), frequency of children asking for a certain item (Freqask), and frequency of parents agreeing to buy in general (Freqbuy).

The Ordered Probit Model is repeated for each of the following dependent variables: pa_grade; pa_info; paratd_food; pa_nutri; and pa_housework. These variables measure parents' agreement/ disagreement with statements two to five, respectively, listed in Table 5-1. The six statements listed in Table 5-1 can be considered as measurement of the relationship between children's resource and their influence on parent's purchase decision. These statements measure children's impact on parent's purchase from six aspects with regard to children's resources : the necessity of the item for children's study (study), measured by whether or not parents would agree to buy an electronic device for reading or listening o books to help children with school ; their progress in grade at school (grade), measured by if parents would be more likely to agree to buy a certain item when children get better grade in school; the information they provided during shopping (information), whether parents would buy a certain brand when children told parents that brand is preferred because it works better for school or they know how to use it from school; their preference towards a certain item (food), measured by whether parents would be more

likely to buy a certain food that children liked or asked for at grocery store; the nutrition knowledge of a certain item that children provided (nutrition), measured by whether parents would be more likely to buy a certain food when children have learned about the nutrition information of that food at school (and it is considered healthy) ; and children's contribution towards housework (housework), measured by whether parents would be more likely to purchase things for children when they helped a lot at home.

Results

Data from 163 surveys was used to estimate the ordered probit models. Summary statistics for the dependent variables are shown in Tables 5-3, 5-4 & 5-5

Since the six statements making the dependent variables were answered by the same person, and their answers will inevitably affected by their personality, the answers would likely be correlated. Thus the qualitative and limited dependent model (QLIM) procedure in SAS, which has the ability to analyze the models involving simultaneous association, was used. Correlation tests were run, and based on the results (($Rho < 0.0011$ in all cases), the variables are correlated, supporting use of the QLIM procedure. Results of the ordered probit models are shown in Tables 5-6.

Family Characteristics and Parents' Demographics

The coefficient for gender is significant in five of the six cases, with the exception being children's preference (pa_food). The positive sign on the five significant coefficients indicates mothers (female) are more likely to be influenced by children during the shopping progress than fathers (male). In the case of whether or not a parent will purchase a food from the grocery store because the child likes it, gender was not significant. In fact, in this equation, only two factors were significant: parents' frequency of agreeing to buy a certain food in general (freqbuy), which is positively related to likelihood to purchase a food because the child likes it, and their level of

nutrition knowledge, which is negatively related. This result is consistent with previous research constructed by Berry and Pollay (1968) that the more mothers cared about nutrition, the less influence the children has over food purchases .

The coefficient of parents' education level (education) is significant in two cases: when checking the relationship between children's power in family purchase with children's knowledge of certain brand/item (pa_info), and children's nutritious knowledge of certain food (pa_nutri). In both of the two statements, the sign of the coefficients is negative, indicating that parents' education level is reversely connected with the children's influence, which means that the higher education parents' received, the lower possibility that they will buy things children liked, and thus the smaller children's influence is towards family purchase. This result is reasonable. It may be because that parents with higher education would gain more knowledge, thus they will be more stick to their own opinion, and more difficult to be affected by their children. However, in the other 4 cases, education is not an influential factor, making no difference on the power of children in family purchase.

Parents' self-rated grade of nutrition knowledge (nutrigrade) is only significant in one statement, which checks the relationship between children's amount of influence and children's preference towards certain food (pa_food). In this case, the grade of nutrition knowledge is negatively associated with children's influence. It is easy to explain the reverse relationship between parents' knowledge of nutrition and children's influence when considering children's preference towards a certain food. With higher nutritious knowledge, when deciding whether or not to buy a certain food that children like, parents would consider more about its nutritious contents, which would decrease children's influence in the process of decision making. In other five statements, parents' level of nutrition is not significant factor.

The coefficient of family income is only significant in one case, which is examining the relationship between children's influence and the knowledge or information of a certain brand they provided during shopping (pa_info). The positive coefficient sign in this case shows that the higher of family income, the larger amount of children's influence. This result may be because that when deciding a certain brand, with high income, parents would pay more attention towards the functions and its help for children thus would care less about other factors for example the price. In this way, children will play a more important role in the process of purchase. This result is consistent with numerous of researches, like the one conducted by Jenkins (1979). Income is not statistically significant in other cases.

Parents' age turns to be a significant factor in only one out of six cases. When exploring factors affecting the amount of children's influence concerned about children's contribution to housework (pa_housework), the sign of the coefficient of parent's age indicates that that the older of the parents, the more difficult for them being influenced by children. This may be because that older parents would be more traditional and conservative, thus they would be less influenced by their children, which is consistent with previous research constructed by Roberts et al (1981).

Besides the variables above in the group of family characteristics and parents' demographics, there do still exist two more variables: marital status and number of children in the family, which are statistically insignificant in all the six cases. It was expected that children in single family may have larger influence in family shopping according to the previous researches constructed by Taylor et. al,(1985). However, it may be because that we only checked parents' agreement towards six describing statements, which would possibly provide subjective

responses, thus it would decrease the impact the marital status on children's influence in family purchase.

Children's Characteristics

Children's characteristics, which consists of children's gender (chigender), children's age (chiage), frequency of doing homework (fqhome), and frequency of doing housework (fqhouse) are also related variables which would impact the amount of children's influence in family shopping.

The coefficient of children's frequency of doing housework (fqhouse) is statistically significant in three out the six cases, concerned respectively towards necessity of certain item in study (pa_study), children's progress in grade (pa_grade), and contribution towards housework (pa_housewok). In all these three statements, the coefficient sign of children's frequency of doing housework is positive. It is easy to conclude that in these three case, children do more housework at home would have larger influence towards family purchase. This result is easy to understand. Generally, children who did more housework at home would have more influence in the family because they made more contributions to the family, according to the resource theory developed by Blood and Wolf (1960). Thus, when deciding whether or not to buy a certain item as a prize for children's contribution to housework, progress in school or to buy the item which are necessary in study, children who made more contribution would be more influential towards their parents.

Children's frequency of doing homework (fqhome) is a statistically significant factor in three cases, which are checking the relationship between children's power in family purchase with children's necessity in study (pa_study), children's progress in grade (pa_grade) and contribution towards housework (pa_work). In all of the three cases, the coefficients' signs of children's frequency of doing homework are positive, indicating that parents would be more

agreed to buy certain item that children asked either as a helpful leaning tool, or as a prize for their progress in school or contributions towards housework when children do more homework at home.

The coefficients of both children's age and gender are only statistically significant in the case concerned about the nutritious information provided by children in the process of family purchase (pa_nutri). The sign of age' coefficient is negative, indicating that the younger the children, the more influential of them towards parents when buying a certain food. And the positive sign of gender shows that boys are more influential than girls in this case.

Family Shopping Habits

The group of family shopping habits is consisted of three variables: frequency of shopping with children (freqshopchi), frequency of children asking for a certain item during shopping (freqask), and frequency of parents agreeing to buy in general (freqbuy).

The coefficient of frequency of children asking for a certain item (freqask) is statistically significant in three cases, correspondingly regarding to the necessity of certain items in study, children' progress in school work and contribution to housework. The coefficient signs in all the three cases are positive, which means that the more children bargaining for a certain item, the larger possibility that parents would agree to buy a certain item which children asked as a prize for their progress in study or a learning tool in their schoolwork. This result is consistent with the Cowan and Avants (1988)'s work. "Asking a certain item from parents need some strategies, and the use of strategies like bargaining would increase the possibility of children's influence."

Frequency of parents agreeing to buy items children asked in general (freqbuy) is only affective in the one case concerned children's preference towards a certain food (pa_food). The positive coefficient sign indicating that higher frequency of parents' agreeing to purchase what

children asked in general, the larger amount of children's influence in family purchase decision-making.

The frequency of shopping with children is insignificant in all the six cases, which indicates that shopping with parents does not improve the influence of children in family shopping.

Summary

By applying the Ordered Probit Model in this chapter, we found the factors that affecting children's influence in family shopping. In this model, 26 variables were used, with 6 dependent variables, and 20 independent variables. In the chapter of conclusion, the relationship between each factor with children's influence will be discussed.

Table 5-1. Statement testing parents' attitudes towards children's influence in shopping

Label	Statement
1	If my child told me that he/she needs an electronic device for reading or listening to books to help his/her with school, I would think about buying one.
2	The more my child studies and the better he/she does in school, the more likely I am to think about buying a new electronic device (for reading/listening to books) for him/her.
3	When deciding what electronic device (for reading/listening to books) to buy, if my child told me that there is a certain brand they need because it works better for school or they know how to use it because they learnt it at school, I would buy that brand.
4	If my child told me that she/he wants to get a certain food from the grocery store, because she/he likes it, I will be more likely to buy it for them.
5	If my child told me that she/he wants to get a certain food from the grocery store, because she/he learnt how healthy it is at school, I would be more likely to buy it for them.
6	The more my child helps around our home, the more likely I am to purchase things for him/her as a reward

Table 5-2. Variables used in the ordered probit model

Variable	Definition of Variable	Coding
Pa_study	Parents' agreement towards first statement concerning study	= 0 if parents totally disagree = 1 if parents disagree = 2 if parents neither agree or disagree = 3 if parents agree = 4 if parents totally agree
Pa_grade	Parents' agreement towards second statement concerning grade	= 0 if parents totally disagree = 1 if parents disagree = 2 if parents neither agree or disagree = 3 if parents agree = 4 if parents totally agree
Pa_info	Parents' agreement towards third statement concerning knowledge of certain item/brand	= 0 if parents totally disagree = 1 if parents disagree = 2 if parents neither agree or disagree = 3 if parents agree = 4 if parents totally agree
Pa_food	Parents' agreement towards fourth statement concerning children's preference	= 0 if parents totally disagree = 1 if parents disagree = 2 if parents neither agree or disagree = 3 if parents agree = 4 if parents totally agree
Pa_Nutri	Parents' agreement towards fifth statement concerning nutritious information	= 0 if parents totally disagree = 1 if parents disagree = 2 if parents neither agree or disagree = 3 if parents agree = 4 if parents totally agree
Pa_housework	Parents' agreement towards sixth statement concerning children's contribution to housework	= 0 if parents totally disagree = 1 if parents disagree = 2 if parents neither agree or disagree = 3 if parents agree = 4 if parents totally agree
Pargender	parents' gender	Female=1; Male=0
Parage	parents' age	Continuous
Pareduc	parents' education	Continuous
Marstatus	Marital status	single family=1; ordinary family=0

Table 5-2. Continued

Variable	Definition of Variable	Coding
Nochild	Number of children in family	Continuous
Income	Household income	Continuous
Nutrigrade	Grade of nutrition knowledge	Continuous
Chigender	Child's gender	Female=1; Male=0
Chiage	Child's age	Continuous
fqhome	Children's frequency of doing homework	More than frequently=1; less than frequently=0
fqhouse	Children's frequency of doing housework	Continuous
Freqshopchi	Frequency of shopping with children	Continuous
Freqask	Frequency of children asking for a certain item	Continuous
Freqbuy	Frequency of parents agreeing to buy	Continuous

Table 5-3. Sample descriptive statistics—parents’ characteristics

Variable	Variable Description	Sample%(N=163)
Gender	Female	90.00
	Male	10.00
Age	<=30	6.75
	31-45	70.55
	>45	22.70
Education	Less than Some College	9.81
	Some College	41.10
	Bachelor or More	49.08
Marital Status	Ordinary Family	22.09
	Single Family	75.46
Number of Kids	1	15.34
	2	53.37
	≥3	31.29
Annual Household Income	\$14999 or less	7.41
	\$15,000-\$24,999	11.73
	\$25,000-\$34,999	6.79
	\$35,000-\$49,999	14.20
	\$50,000-\$74,999	19.14
	\$75,000-\$99,999	16.05
	\$100,000-\$149,999	19.14
	\$150,000-\$199,999	4.32
	\$200,000 or higher	1.23
Grade of Nutrition Knowledge	A	34.97
	B	46.01
	≤C	19.02

Table 5-4. Sample descriptive statistics–children’s characteristics

Variable	Variable Description	Sample%(N=163)
Gender	Girl	55.83
	Boy	44.17
Age	9 and under	15.95
	10	47.85
	11 and older	36.20
Frequency of doing homework	1 or 2 times each week or less	3.37
	4-5 times each week	11.04
	Everyday	85.89
Frequency of doing housework	Rarely or less	40.26
	Sometimes	45.28
	Frequently of more	14.46

Table 5-5. Sample descriptive statistics–shopping characteristics

Variable	Variable Description	Sample%(N=163)
Frequency of Shopping with Children	About Half of times of Less	22.29
	Usually	37.97
	Always	29.75
Frequency of Children Asking for Things during Shopping	About Half of times of Less	25.16
	Usually	44.79
	Always	30.06
Frequency of Parents Purchasing Things Children Asked	Rarely or Never	3.09
	Occasionally	43.83
	Frequently or More	53.08

Table 5-6. Ordered probit model result

	Pa_study	Pa_grade	Pa_info	Pa_food	Pa_nutri	Pa_work
Paage	0.0531 (0.070)	-0.08 (0.070)	-0.069 (0.068)	0.072 (0.074)	-0.008 (0.075)	-0.142** (0.070)
Pagender	0.531* (0.312)	0.623** (0.305)	0.387* (0.305)	0.230 (0.317)	0.688** (0.347)	0.736** (0.310)
Paedu	-0.057 (0.106)	-0.076 (0.105)	-0.159* (0.104)	-0.029 (0.110)	-0.105* (0.113)	-0.114 (0.105)
Nochild	-0.004 (0.095)	0.080 (0.095)	0.059 (0.094)	0.089 (0.100)	0.014 (0.100)	0.110 (0.097)
Marstatus	0.096 (0.244)	-0.010 (0.242)	0.279 (0.240)	0.168 (0.252)	0.188 (0.266)	-0.245 (0.243)
Income	0.067 (0.059)	-0.018 (0.058)	0.194*** (0.059)	0.046 (0.061)	0.013 (0.062)	-0.052 (0.059)
Nutrigrade	-0.044 (0.125)	-0.212 (0.124)	-0.007 (0.123)	-0.194* (0.130)	0.051 (0.134)	-0.190 (0.124)
Chigender	0.128 (0.183)	0.065 (0.181)	0.095 (0.179)	-0.133 (0.190)	-0.438** (0.196)	-0.104 (0.180)
Chiage	-0.125 (0.123)	-0.160 (0.122)	-0.083 (0.120)	0.048 (0.125)	-0.314** (0.129)	-0.132 (0.122)
fqhome	0.164* (0.520)	1.153** (0.554)	0.438 (0.508)	-0.288 (0.551)	-0.219 (0.549)	-1.469** (0.584)
fqhouse	0.055* (0.030)	0.064** (0.029)	0.063*** (0.029)	0.017 (0.030)	-0.017 (0.031)	0.070** (0.029)
fqshopchi	-0.052 (0.123)	-0.011 (0.123)	0.060 (0.120)	0.013 (0.127)	0.132 (0.132)	-0.111 (0.122)
Freqask	0.250*** (0.097)	0.320*** (0.097)	-0.010 (0.095)	0.115 (0.100)	0.014 (0.102)	0.161* (0.096)
Freqbuy	0.073 (0.145)	-0.008 (0.144)	0.165 (0.143)	0.969*** (0.166)	0.074 (0.159)	0.223 (0.146)

“*”: Significant at 10% “***”: Significant at 5% “*****”: Significant at 1%

CHAPTER 6 CONCLUSION

This research consists two parts: the influence of National School Program on children's food preferences, and factors affecting the influence of children in family purchases.

In the first part of the study, results show that approximately half of students report eating school lunch regularly; however, the quality of current school foods is not rated as high as home lunch. When checking the correlation between children's preferences for twelve foods which are commonly found in School Lunch and likely eaten at home, ratings for both locations are significantly correlated. However, children consistently prefer home food more than school meals. In two cases, pizza and hamburger, there was no correlation between the ratings of home and school lunch, indicating the quality of these two foods is significantly different.

In the second part, children's influence on family purchases is examined. From previous studies, it has been found that children's resources, family characteristics, children's characteristics, and other socio-economic factors play a significant role in the amount of children's influence in the process of parents' decision making. From this research, I conclude that children's resource including their study habits, school grades, contribution towards housework, knowledge of certain brands, and nutrition information are important factors affecting children's influence.

Results indicate that mothers are more likely to buy what children liked if the children really need certain learning tools for school work. The more children asked or bargained, the higher possibility that parents would buy the items children needed. Other variables positively related to the likelihood to purchase what the child wants is at home study

effort on (frequency of doing homework), and contribution to housework (frequency of doing housework). The more children do housework/homework, the larger the possibility that parents would agree to buy items that are helpful for their school work. However, in this case, other factors, like parents income and education level, children' age and gender and family shopping habits do not significantly affect likelihood for parents to purchase the items.

A second model examined whether or not parents were more likely to purchase items if the child is doing well on their grades at school. Again, mothers are more easily influenced than fathers. Also similar to the previous case, the more children do housework/homework, the more children asking for a certain item, the higher possibility that parents would agree to buy items for the children.

In the model examining whether or not parents are likely to listen to children's request for specific items based on the information their child has, the significant factors change, although mothers are still more likely to be influenced. In this case, parents' education level is significant, with the higher level of education of the parents, the less influence the children's information has on their decision. Another significant factor is parents' income. Parents with higher levels of household income, are more likely to be influenced by children to decide which food/brand to buy, thus the children's influence would be larger. At last, children's contribution towards housework still weighs significantly in this case. The more children do the housework, the more important they weigh in the family, thus the larger influence of them in the decision making process. In this case, children's demographics and family shopping habits are not significantly related to influence.

The fourth model examines whether or not parents would be more likely to buy a specific food when children have learned about the nutrition information of that food at

school (and it is considered healthy). The significant factors in this model are different from the previous ones. Besides mother are still more likely to be influenced, children's demographics are significantly related to children's influence. The age of children is negatively related with children's influence. The younger the child, the larger possibility that parents would buy the specific foods they asked for. Another significant factor is children's gender, with boys being more influential than girls. Common with the other models, the frequency of children doing housework is still a positive factor affecting the amount of children's influence.

The next model examined whether or not parents were more likely to agree to buy a certain foods because of children's preferences. In this case, only two factors are significant: the frequency of parents agreeing with children in general during shopping, and parents' self-graded nutritional knowledge. Parents' level of nutritional knowledge is negatively related to the likelihood to purchase the foods that the child liked. The frequency of agreeing with children in general is a positive factor, indicating that the more parents would listen to children's request in general, the larger the possibility that parents would buy the food children liked.

Finally, the last model examines whether or not parents would be more likely to purchase items if children made contributions towards housework. Mothers are more easily influenced than fathers again in this case. Parent's age is also a significant factor. The older of the parents, the less possibility that parents would decide to purchase items children want. In the respect to the children's characteristics, frequency of asking for a certain item during shopping and the frequency of doing housework are both significant factors, working positively with the amount of children's influence in family purchase. This indicates that if

the child does participate more frequently in helping with housework, the parents are more likely to purchase items for the children based on this factor.

In summary children's characteristics, parents' demographics and family characteristics do influence the amount of children's influence in family purchase. But in different situations, the affecting factors will be different.

CHAPTER 7 IMPLICATION

Developing a better understanding of children's opinions of lunch served at school is of value to the schools, as well as the administrators of the National School Lunch Program. If a goal of the NSLP is to teach children healthy eating habits, it will be important to provide foods they like. Our research shows that current food served in the NSLP does not meet the preferences of students as well as food from home.

Although the school lunch foods were not rated as highly as at home foods, 1/3 of students still identified the school lunch program as a source of information on new foods they ask for at the grocery store. Therefore, it does seem like there is potential to teach children about foods at school. To further understand this process, it is important to also study what makes children more influential in the family decision making process. Parents tend to be more likely to listen to children's requests for purchases or requests about specific brands/items if the child is doing well in school (grades). Results also suggest parents will listen to children's requests if their children have information about the nutritional value of the food. This implies that the NSLP could pair nutrition education with the school lunch to try to influence at home behavior. This could also potentially be carried over to food manufacturers and marketers – if they provide positive nutrition information to children, it may influence the parents purchasing habits.

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BIOGRAPHICAL SKETCH

Yuan Jiang is a student of the Master of Science program in Food and Resource Economics Department at University of Florida. Yuan was born in Shandong, China. She attended Shandong University in China to gain her bachelor's degree in economics from 2007 to 2011. After successful graduation, she was admitted to the University of Florida and majored in food and resource economics. She scheduled to graduate in December, 2013. After graduation, she will continue her education and seek for PhD in agricultural economics at University of Florida.