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HELP IN OVERWEIGHT/OBESITY PREVENTION EFFORT (HOPE) STUDY:  
A STUDY TO IDENTIFY RESILIENCY FACTORS TO CHILDHOOD OBESITY  
AND COMPARISON BETWEEN BODY MASS INDEX  
AND FIGURE RATING SCALES

by

Rebecka L. Bagwell-Hanson

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF SCIENCE

in

Nutrition and Food Sciences

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Logan, Utah

2011

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**ABSTRACT**

Help in Overweight/Obesity Prevention Effort (HOPE) Study –  
A Study to Identify Resiliency Factors to Childhood Obesity  
and Comparison Between Body Mass Index  
and Figure Rating Scales

by

Rebecka L. Hanson, Master of Science

Utah State University, 2011

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Department: Nutrition, Dietetics, and Food Sciences

Obesity results from a complex interaction between diet, physical activity, and the environment. The purposes of this study were to identify behaviors associated with resilience to childhood obesity, and to compare the sensitivity of the Figure Rating Scales (FRS) in reflecting Body Mass Index (BMI).

Fifty health professionals in nutrition and 35 low-income, parent-and-child pairs completed the study. Children aged 6-11, perceived as “normal-weight” by their parents, were recruited. Five children had a measured BMI above the 85<sup>th</sup> percentile. Using a picture-sort method, each participant responded to a series of questions about 13 childhood obesity-related messages. Results included comparison between health professionals, parents, and children about 1) familiarity toward each message, 2)

frequency in following the recommendation, 3) perception of ease for others to follow, and 4) perception of effectiveness to help prevent childhood obesity. Health professionals and parents had similar familiarity regarding all 13 messages. However, in terms of practicality, health professionals and parents differed significantly in eight messages that they reported “always taught/followed,” seven messages that they “sometimes taught/followed,” and two messages that they “seldom or never taught/followed.”

In most messages, children’s observation about what the family followed differed from what parents reported following. In terms of ease for others to follow “Watch portion sizes” and “Tell children to eat all of the meal before getting dessert,” health professionals and parental perception differed significantly. In terms of effectiveness in childhood obesity prevention, health professionals and parents agreed on 12 of 13 messages. Health professionals did not find message “Tell children to eat all of the meal before getting dessert” to be effective in preventing childhood obesity, whereas parents did.

FRS and measured BMI were significantly correlated among health professionals ( $r=0.75$ ), parents ( $r=0.72$ ), and children ( $r=0.53$  for children ages 8-11,  $r=0.64$  when a mother selected a silhouette for her child). For different subgroups, parent-and-child silhouette selection was closely correlated ( $r= 0.84$ ). However, correlation between child’s BMI percentile and silhouette was nonsignificant in most subgroups ( $r= 0.47$ ). In conclusion, FRS was effective among adults and older children (aged  $\geq 8$ ) in reflecting BMI but not among younger children (aged 6-7). (126 pages)

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Rebecka L. Bagwell-Hanson

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# **CHAPTER 1**

## **INTRODUCTION**

### **INTRODUCTION**

Obesity is commonly measured by the body mass index (BMI) (1, 2). The BMI is a formula based on a person's weight measured in kilograms divided by a person height measured in meters squared (kg/m<sup>2</sup>) (2). For adults, overweight is defined as BMI between 25.0 and 29.9, obese when BMI is between 30.0 and 34.9, and morbidly obese when BMI is greater than 35 (2). For children, a growth chart is used in conjunction with the child's measured BMI to determine if the child is overweight or obese (3,4). Using the growth chart, a child's BMI percentile is determined (4). The Center for Disease Control and Prevention determined that when a child's BMI for age is between the 85<sup>th</sup> to 94<sup>th</sup> percentiles, the child is considered overweight; if the child's BMI for age is at the 95<sup>th</sup> percentile or above, the child is considered obese (4).

### **Prevalence of Childhood Obesity in the United States**

The prevalence of obesity has increased in both children and adults since 1975 (5). In the U.S., approximately 33% of all American adults are obese, and 16% of children aged 6-19 are obese (5,6). Although Utah ranks the lowest in childhood obesity prevalence and 44<sup>th</sup> in adult obesity prevalence in U.S., 23.1% of children and 22.5 adults are obese (7). Over the past three decades, the rate of childhood obesity has more than doubled for preschool children aged 2-5 years and adolescents aged 12-19 years, and it has more than tripled for children aged 6-11 years (8).

Obesity affects many minority youth populations as well. The National Health and Nutrition Examination Survey (NHANES) found that 21% of African American and

23% of Mexican American adolescents ages 12-19 were more likely than non-Hispanic White adolescents (14%) to be overweight (8). Among children ages 6-11, 22% of Mexican American, 20% of African American, and 14% of non-Hispanic White were overweight (8). This phenomenon may be attributed to various reasons, including cultural preferences, genetic socioeconomic status and the availability of fruits and vegetables among these populations.

### **Contributing Factors of Childhood Obesity**

Obesity is a complex and multifactor condition. The dramatic increase in childhood obesity is due to two key issues: 1) the complex interaction between many behavioral and environmental factors that influence eating and physical activity (9), and 2) obesity resulting from an imbalance of energy intake and energy expenditure (9). Common behavioral factors include energy intake, physical activity and sedentary activities, parental and grandparental influence on role modeling and beliefs about food, and the influencing factors within childcare and school, as well as the community and culture.

#### *Energy Intake*

Many studies have been performed in an attempt to identify specific food or dietary patterns that contribute to excessive intake in children (10). Large portion sizes of food and beverages, eating meals away from home, frequent snacking on energy-dense foods and consuming beverages with added sugar are often associated with determining excess energy intake among children (10,11). Evidence is growing to suggest an

association with consuming sugar sweetened beverages and weight gain in children (12,13). Consuming sugar-sweetened beverages may be associated with obesity because these drinks are high in calories (13) compared to water. Children may not compensate at meals for the calories they have consumed in sugar-sweetened beverages (13). Also, liquid forms of energy may be less satiating than solid forms, thus leading to higher caloric intake (13). Ludwig et al. found an increase consumption in sugar sweetened beverage is positively associated with a change in BMI (14).

Another study examined the caloric expenditure of certain physical activities to the average caloric intake of a popular fast food restaurant chain (15). It was found that 45 minutes of exercise (bicycling, walking, dancing, running) for a 75-pound child expended 90, 135, 180 and 325 calories, respectively. Whereas, in a regular sized value meal from this fast food chain averaged approximately 650 calories (15). Thus demonstrating that a child would need to participate in high-intensity exercise for at least 90 minutes to counteract the calories consumed in that meal.

A cross-sectional study of 18,486 school aged children performed by Scully et al. (16) found that 20% of students were meeting the daily requirement of four servings of vegetables per day, whereas 39% were eating the recommended three daily servings of fruit (16). It was shown that 46% of students consumed fast food meals at least twice a week; 51% consumed snack foods four or more times per week and 44% consumed sweetened beverages four or more times per week (16).

### *Physical Inactivity*

Physical activity has been associated with many beneficial effects for physical and emotional health (17). It not only helps a child maintain a healthy weight, but it has been shown to decrease blood pressure and increase bone strength (17). Research has indicated that a decrease in physical activity without a related decrease in energy intake may be an underlying cause for the increase in obesity among children (18). Rennie et al. (19) conducted a cross-sectional study among 100 children aged 6-8, and found that active energy expenditure and physical activity were negatively associated with body fatness among children (19). Pate et al. (20) determined that one-third of children study are not getting the recommended levels of moderate or vigorous physical activity and physical activity level fell as the child increased in age (20).

A recent examination of the Department of Education's Early Childhood Longitudinal Survey (ECLS-K) (21) found that over the space of two years a one-hour increase in physical education per week resulted in a 0.31 point drop (approximately 1.8%) in BMI among overweight and at-risk grade school girls. There was a smaller but significant decrease in boys. The study concluded that incorporating physical education in kindergarten to at least five hours per week could reduce the percentage of girls classified as overweight from 9.8 to 5.6% (21). A cross-sectional study of school-aged children performed by Scully et al. found that 14% of students engaged in recommended levels of physical activity, and 29% engaged in recommended levels of sedentary behavior (16). It was also determined that increased television viewing was associated with a lower intake of fruit and vegetables in conjunction with a higher intake of unhealthy or high-caloric foods (16).

### *Sedentary Behavior*

Television, video games and computer use consume a large proportion of children's time, thus affecting their physical activity levels (21). On average, it is estimated that children in the U.S. spend over 3 hours per day with these electronic devices (22). Multiple studies have shown a positive association between the amount of time spent with electronic devices and an increase in BMI (23-26).

It is theorized that media use can contribute to increased energy intake due to excessive snacking and eating meals in front of the television or computer (27-29). Vanderwater et al.(30) noted that there is a significant interaction between television viewing hours and a child's weight status when simultaneously factoring in parental obesity (30).

### *Parental and Grandparental Influence*

Several parental influences affect the health habits of youth. If one or both parents are overweight, a child younger than 15 years old is 73% more likely to be overweight than children of the same age who have both parents of healthy weight (31). In children younger than 10 years old, parental obesity is a more potent risk factor than the child's own weight status in predicting whether or not the child will become an obese adult (31). Whitaker et al. (32) noted that obese children under the age of three without obese parents are at a lower risk for obesity in adulthood. However, parental obesity more than doubles the risk of adult obesity among both obese and non-obese children below age 10 (32).



The foods available to the child, the amount of time the child is left unsupervised, and the child's eating interactions with other children are all influenced by parent(s) (33). Also parental food preference will influence their children's food preference (33).

Another study reported that parents who ate diets high in saturated fats also had children who ate diets high in saturated fats (34). It is believed that this observation is not only due to the foods parents fed their children, but also due to the preferences children developed through exposure to foods that their parents provided early in the child's life (35). Studies agree that the availability of fruits and vegetables in a home are positively associated with greater preferences for and consumption of fruit and vegetable by children (36).

In addition, studies have shown that when a parent attempts to control what and how much a child eats, it also affects the child's food preference (37). Birch and Fisher determined that parents who attempt to encourage or discourage the consumption of certain foods may affect the child's preference to those foods (37). For example, if a parent makes a child eat all their vegetables, and then offers a dessert as a reward for finishing the vegetable; the child may view the dessert as something more desirable and the vegetables as less desirable.

### *Childcare Factors*

A child's eating patterns and physical activity level may be affected by having parents who work outside the home (38). One study speculated that childcare providers may be more likely than parents to offer a child energy-dense foods with low nutritional values (38). Another study speculated that children in a household where both parents

work outside the home may serve more energy-dense or fast foods due to time issues (39). Additionally, it was found that unsupervised children may choose foods with lower nutritional values when choosing their own snacks (39).

### *School Factors*

In the U.S., the majority of children ages 5-17 are enrolled in schools. Over 85% of children get either breakfast or lunch from school meal programs, and over 10% receive both breakfast and lunch from school meal programs (40). Foods that schools serve play a significant role in what children consume. For example, making more low-fat foods available to children in school reduces the amount of fat they consume. However, in competition with school meals, older children may have access to a wide variety of snack foods and drinks through vending machines, school stores, and fundraisers. Research suggests that access to these food sources also have a significant impact on children's diet (40).

In regards to physical activity, children are spending less time in engaged physical activity during school. Daily participation in school physical education among adolescents dropped 14% over the last 13 years, i.e., from 42% in 1991 to 28% in 2003 (41).

### *Community and Culture*

Obesity results from a complex interaction between diet, physical activity, and the environment. The built environment is defined as “a range of physical and social elements that make up the structure of a community and may influence obesity” (42). For

example, a lack of sidewalks, safe bike paths, and parks in neighborhoods can discourage children from participating in physical activity (43). Additionally, lack of affordable, healthy food choices in neighborhood markets can be another obstacle in purchasing healthy foods (43).

A number of studies have found a negative relationship between socioeconomic status (SES) and being overweight or obese (44,45). SES is defined as a combination of parental income, parental education, and occupation status (45). It appears that the relationship between SES and obesity varies by race and/or ethnicity (45). This observation may be due to lack of accessible supermarkets, an increased number of fast food chains in SES demographics and a belief that energy-dense foods are less expensive (46-49).

Access to supermarkets has been associated with a greater consumption of fruits and vegetables (46). Studies have shown that access to supermarkets is relatively lower in low SES communities (46). This is also true for non-white neighborhoods. Morland et al. reported that in the year 2002, there were four times more supermarkets located in non-Hispanic White neighborhoods than in African American neighborhoods (47). In addition, the ratio of supermarkets to residents was higher in non-Hispanic White neighborhoods (1 supermarket:3,816 residents) than in African American neighborhoods (1 supermarket:23,582 residents) (47). Contrastingly, it has been shown that access to fast-food restaurants may be greater in African American or low-SES neighborhoods than other race/ethnicity (48). Block et al. stated that the number of fast-food restaurants was the highest in neighborhoods where African American and low-income populations

predominantly lived (48). In addition, energy-dense foods are perceived as less expensive and therefore, play a critical role in obesity in low SES communities (49). Drewnowski et al. suggests that the probability of consuming a healthful diet decreases with decreasing income (50).

A number of studies indicate that African American women are more likely to accept a larger ideal body image than are women from other race/ethnic groups (51-53). Data suggest that African American women who are overweight are less likely than Hispanic or non-Hispanic White women to try to lose weight and may not perceive themselves to be overweight (53). Social norms and attitudes about attractiveness differ for men and women. Slenderness has a much stronger importance for women, which appears to increase with upward mobility or high social position (54). Social disapproval of obesity and excess weight in men is less evident than in women in all ethnic groups (55).

### **Co-morbidity and Consequences of Childhood Obesity**

Many consequences commonly associated with adult obesity are being seen in obese children. Such consequences of childhood obesity include: cardiovascular problems, type II diabetes mellitus, metabolic syndrome, asthma, psychosocial concerns, obstructive sleep apnea, and orthopedic problems (56).

#### *Cardiovascular*

Obese children and teens have been found to have many risk factors for cardiovascular disease (CVD). These risk factors include: high cholesterol levels, high

blood pressure and abnormal glucose tolerance (57). In a population-based sample of 2,617 children aged 5-17, 60% of obese children had at least one CVD risk factor, while 29% of obese children had two or more risk factors (57). Similar to what occurs in adults, an increased low-density lipoprotein (LDL) cholesterol level and triglyceride level with a decreased high-density lipoprotein (HDL) cholesterol level is more common among significantly-obese children than moderately-overweight children (57). Likewise, obese children have three times higher risk for hypertension than non-obese children (58).

#### *Type II Diabetes Mellitus*

For children born in the U.S. in 2000, the lifetime risk of being diagnosed with noninsulin-dependent diabetes mellitus (type 2 diabetes) at some point in their lives is estimated to be 30% for males and 40% for females (59). It was reported that 4% of new diagnoses of diabetes before 1992 were classified as type 2 diabetes. In 1994, 16% of new diabetics were classified as type 2 (59). The lifetime risk for developing type 2 diabetes is even higher among ethnic minority groups (60). In a cross-sectional, population-based study of diabetes in youth aged 10-17, type 2 diabetes was more common than type 1 diabetes (60). Onset of diabetes in children and adolescents can result in advanced complications such as CVD and kidney failure (61).

#### *Metabolic Syndrome*

Metabolic syndrome is a collection of risk factors that contribute to CVD. The risk factors that are included in metabolic syndrome are: insulin resistance, high blood pressure, high cholesterol and a waist circumference greater than 40 inches in men and 35

inches in women (62). According to the 1999-2000 NHANES, almost one-third (32.1%) of overweight children met the criteria for metabolic syndrome (63). In a prospective study of nearly 2,400 girls aged 9 and 10, it was found that overweight girls were 10 times more likely to have elevated systolic blood pressures, and six times more likely to have low HDL cholesterol levels, and 2 to 3 times more likely to have elevated diastolic blood pressures, triglycerides and total LDL cholesterol levels (64).

### *Psychosocial*

Some consequences of childhood obesity are psychosocial. The weight of an obese child may often be seen by themselves and others, as a significant handicap (65). The World Health Organization (WHO) has suggested that adults who have been obese since childhood are more likely to suffer from psychological disturbances (66). Obese children are often targets of social discrimination (65). Low self-esteem and behavioral problems were particularly common in associating with obesity (65). Other psychosocial problems associated with childhood overweight relate to self-concept, excessive weight control and overeating disorders (67). An impaired self-concept has been associated among children as young as five years old, who have a weight for height exceeding the 85<sup>th</sup> percentile (18). Overweight children are more likely to suffer from lower self-esteem (68,69).

### *Asthma*

Asthma is a disease of the lungs in which the airways become blocked or narrowed causing breathing difficulty (70). Studies have identified association between

childhood obesity and asthma (71,72). This association may be explained by the link to lack of physical activity (73). A cohort study conducted by Gilliland et al. concluded that being overweight is associated with an increased risk of newly onset asthma in children. This study suggests that physical activity levels and dietary habits relate to childhood asthma onset (73).

In addition, other harmful conditions have been linked to childhood obesity. These include orthopedic problems, such as Blount's disease, skin fungal infections, and acanthosis nigricans, pseudotumor cerebri, hepatic steatosis and steato-hepatitis (6,31,74,75).

### **Health Recommendations Given by Professionals to Community Thus Far**

In regards to childhood obesity, there are three levels of prevention: 1) Primordial Prevention which aims to maintain normal BMI throughout childhood and adolescence; 2) Primary Prevention which aims to prevent overweight children from becoming obese; and 3) Secondary Prevention which aims to reduce co-morbidities and reverse overweight and obesity in obese children, if possible (6).

#### *Primordial Prevention*

Many health recommendations are issued as a preventive measure to help a child maintain a healthy weight. The general recommendations by the American Heart Association (AHA) for children older than three years old emphasize on a healthy diet that relies on fruits and vegetables, whole grains, low-fat and non-fat dairy products, fish and lean meat and beans (76). A number of health recommendations have been provided

and can be located in numerous sources, such as the 2010 Dietary Guidelines for Americans, American Academy of Pediatrics Nutrition Handbook, AHA, and The American Family Physician (21,77-79). A few of these recommendations include:

- Respect the child's appetite: children do not need to finish every bottle or meal (2).
- Avoid pre-prepared and sugared foods when possible (6).
- Limit the amount of high-calorie foods kept in the home (2,6,18).
- Provide a healthy diet, with 30% or fewer calories derived from fat (2,18).
- Provide ample fiber in the child's diet (6,18).
- Skimmed milk may safely replace whole milk at 2 years of age (2,18).
- Do not provide food for comfort or as a reward (6,18).
- Do not offer sweets in exchange for a finished meal (6,18).
- Limit hours of television viewing and computer games (2,6,18).
- 60 minutes of moderate to vigorous play or physical activity daily (2,6,18).
- Establish regular family activities such as walks, ball games and other outdoor activities (2,6,18).
- Control when food is available and when it can be eaten (nutrient quality, portion size, snacking, regular meals) (6,18).
- Provide social context for eating behavior (family meals, role of food in social interaction) (2,6,18).
- Teach about food and nutrition at the grocery store, when cooking meals (2,6,18).
- Counteract inaccurate information from the media and other influences (2,6).
- Serve as role models and lead by example "do as I do" rather than "do as I say" (18).



- Eat whole grain breads and cereals rather than refined grain products (18).
- Reduce the intake of sugar-sweetened beverages and foods(6).
- Reduce added sugars, including sugar-sweetened drinks and juices (6).
- Introduce and regularly serve fish as an entrée (2,6,18).
- Use fresh, frozen, and canned vegetables and fruits and serve at every meal; be careful with added sauces and sugar (2,6,18).

### *Primary Prevention*

When a child is at risk for overweight, the primary goal is to stop a child from gaining more weight, thus allowing the child to grow taller into their existing weight (80). The AHA stresses that parents and primary healthcare providers should work jointly in the effort to helping a child reach and maintain a healthy weight by monitoring weight increase for height and to slow down if excessive, avoid excessive pre-pubertal adiposity, supply nutrition education, and encourage daily physical activity (7). Other recommendations for parents are:

- Parents choose meal times, not children (17,18).
- Provide a wide variety of nutrient-dense foods such as fruits and vegetables instead of high-energy-density or nutrient-poor foods such as salty snacks, ice cream, fried foods, cookies, and sweetened beverages (17,18).
- Pay attention to portion size; serve portions appropriate for the child's size and age (17,18).

- Allow self-regulation of total caloric intake in the presence of normal BMI or weight for height (17,18).
- Limit sedentary behaviors, with no more than 1 to 2 hours per day of video screen or television and no television sets in children's bedrooms (17,18).
- Use nonfat or low-fat dairy products as sources of calcium and protein (17,18,81).
- Limit snacking during sedentary behavior or in response to boredom and particularly restrict use of sweet or sweetened beverages as snacks (e.g., juice, soda, sports drinks) (17,18,81).
- Have regular family meals to promote social interaction and role model food-related behavior (17,18,81).

### *Secondary Prevention*

For children who are considered obese, the objective should be to decrease the severity of obesity and to “treat, reduce, and eliminate co-morbidities (hypertension, dyslipidemia, insulin resistance, and type 2 diabetes)” (6). To lose weight, energy balance must be achieved or the rate of weight gain reduced; this requires a decrease in energy intake and increase in energy expenditure (82). For obese children, weight loss is the first beneficial strategy (76). Small and achievable weight loss goals should be used to avoid discouragement and allow the normal growth process to occur (83).

Involvement of the whole family is key to motivating weight loss (84). In regards to health recommendations, those previously mentioned are applicable to helping a child achieve a healthy weight (7,18,80,81).

### **The Figure Rating Scale**

The Figure Rating Scale (FRS) developed by Stunkard et al. (85) in 1983, consists of nine graphic silhouettes varying from thin to obese (Figure 1). The scale has been previously used as a determinant of body dissatisfaction, requiring adults to self-select a silhouette they believe matches their body size. Self-selected figure ratings have been typically correlated with self-reported BMI among male and female Caucasian adults (85, 86). Few studies have evaluated the association between measured BMI and body size (87). The accuracy of self-reported height and weight has been formerly investigated; generally stating that height is overestimated and weight is underestimated, thus causing BMI to be underestimated (87). Very few studies have evaluated the accuracy of the child's FRS on the child's measured BMI.

### **Statement of Purpose**

The purpose of this study is to 1) identify behaviors associated with resilience to obesity in order to improve the practicality of health practice recommendations given to low-income families to prevent childhood obesity in the U.S.; 2) determine the accuracy of the FRS in reflecting measured BMI among children, while also determine the accuracy of the mother's perception of their child's body size with the use of a child FRS in relation to their child's actual BMI.

### **HYPOTHESIS**

*Hypothesis 1:* Health professionals are recommending practical ways for low-income families to prevent childhood obesity.

*Hypothesis 2:* FRS is sensitive enough to reflect BMI among health professionals and low-income parents with at least one child age 6-11, as well as these children themselves.

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## CHAPTER 2

### BMI AND FIGURE RATING SCALES AMONG HEALTH PROFESSIONALS AND LOW-INCOME FAMILIES

#### ABSTRACT

**Objective:** Determine correlations between Figure Rating Scale (FRS) and measured BMI among health professionals, low-income parents and children aged 6-11.

**Method:** Fifty health professionals and 35 low-income, parent-and-child pairs were surveyed. BMI were measured. Participants self-selected a silhouette that best resembled their body size. Parents also selected a silhouette for their surveyed children. Correlations between FRS and measured BMI were calculated.

**Results:** FRS and measured BMI correlated positively among health professionals ( $r=0.75$ ), parents ( $r=0.72$ ), and children ( $r=0.53$  for children aged 8-11,  $r=0.64$  when mother selected a silhouette for the child). Parent-and-child silhouette selection was closely correlated ( $r=0.84$ ). However, correlation between child's BMI percentile and silhouette was weak in most subgroups ( $r=0.47$ ).

**Conclusion:** Adults accurately identified FRS reflecting their measured BMI. However in children, the child FRS was not as effective in reflecting measured BMI, especially among 6-7 year-olds. Therefore, it is more practical to measure the children's height and weight directly to assess BMI.

#### INTRODUCTION

Figural stimuli (hereafter referred to as silhouettes) have been used to identify individual as thin or obese, mainly among adults as an indicator of when there is



discordance between measured body dissatisfaction. The Williamson Body Image Assessment for Obesity (BIA-O) silhouette, developed to target Caucasians and African Americans, consists of 18 scales ranging from very thin to very obese (1). The Stunkard FRS (2) consists of nine graphic silhouettes varying from thin to obese. Cardinal et al. (3) correlated silhouettes with self-reported BMI. Although others have evaluated the association between measured BMI and body type among youth, young adults (4), older adults (2,3,5-7), ethnic/racial groups (9-11), little or none has been done to compare between measured BMI and silhouettes selected by a child and by the child's parent. To fill this gap, the purpose of this study was to determine the accuracy of the Stunkard FRS in reflecting the BMI among health professionals in health and nutrition, low-income parents and children (aged 6-11), based on self-reported silhouette and silhouette selected by parents for their surveyed children.

## **METHODS**

This study was part of a larger study named the Help in Overweight/Obesity Prevention Efforts (HOPE) Study 1. HOPE Study 1 is part of a National Institutes of Food and Agriculture (NIFA) multistate study, W-1005, entitled "An integrated approach to prevention of obesity in high risks families." Methods and procedures of this study have been reviewed and approved by the Utah State University Institutional Review Board, the Cache County School District, the Granite School District and the Davis County School District (Appendix A). Prior to this study, all adult and youth participants completed an informed consent (Appendix B and C). The study occurred between September 2008 and June 2009 in Utah.

### **Health Professionals Recruitment**

In this study, the term health professional is defined as any individual who interacts directly with a parent-child pair at various capacities while teaching health and nutrition in a professional setting. By word of mouth, 50 health professionals in health and nutrition from Utah State University Extension and the community of all ages and both genders were recruited in four counties in Utah: Cache, Weber, Davis and Salt Lake. Through a referral system, existing health professionals were contacted and then asked to refer other health practitioners and educators to participate in the study.

Each health professional personally completed a paper questionnaire about demographics including: monthly expense of food, their teaching location, clientele's race and age range (Appendix D) Clothes-on body weight was measured with a portable digital scale displaying up to one decimal point, and height with shoes on was measured with a fabric measuring tape, straightly taped against a flat wall. The health professionals self-selected a silhouette from the 9-scale Stunkard FRS (Figure 1) (Appendix E).

### **Parent-Child Pairs Recruitment**

Of 500 families invited to participate by using take-home fliers and a letter (Appendix F) approved by school districts board of participating Title 1 schools, 35 low-income families consisting of at least one parent and a parent-perceived-normal-weight child aged 6-11, living together, were recruited. Low-income families were determined by the use of 2009 poverty guidelines (Appendix G) and were screened prior to each interview. We telephoned and/or emailed parents who were interested in participating to

schedule an interview. Each parent and child was interviewed separately in the same visit.

The parent completed a paper questionnaire about demographics, including monthly expense on food, the name, age, and gender of the surveyed child, and of all other children aged 6-11 (Appendix H). Parent and child's body weight and height were measured using the same method used among health professionals. Each parent and child self-selected a silhouette from the 9-scale adult FRS (Appendix E) and 7-scale child FRS (Figure 2) (Appendix I), respectively. The parent also selected a silhouette that best resembled the surveyed child (Appendix I).

### **Statistical Analysis**

Statistical analyses were carried out using the Statistical Package for the Social Sciences (SPSS 18.0; Prentice Hall, Upper Saddle River, New Jersey). Descriptive statistics were generated for all demographic variables. Pearson correlations between BMI and silhouette scale was calculated. The statistical power to detect a Pearson correlation coefficient  $r=0.60$  at alpha level=0.5 (two-tailed test) with  $n=40$  is 99%. The sample sizes for this study was 35 parents and 50 health professionals.

## **RESULTS**

### **Health Professionals**

Fifty health professionals were interviewed (14 males and 36 females). Mean age was  $30.4 \pm 12.9$  years. There was no significant difference in age between males and females. Table 1 shows the correlation between measured BMI and self-selected

silhouette by health professionals. Positive correlation was found in all samples, both genders, health professionals who aged 21-50, of Asian or White descendant, those who spent less than \$300 on food per month per family, completed some college, technical school, BS or BA degree, working as paraprofessionals, or working at a clinic or hospital.

### **Parents**

Thirty-five parents were interviewed (two fathers and 33 mothers). Mean age for all parents was  $35.2 \pm 3.2$  years. There was no significant difference in age between males and females. Ninety-one percent of mothers were the main cook at home. Table 2 shows the correlation between measured BMI and self-selected silhouette by parents. A positive correlation was observed in all samples and many subgroups based on the number of children, monthly expenses on food, parental education level and parental employment status.

### **Children**

Thirty-five children ages 6-11 were interviewed. There were 17 boys and 18 girls. We identify the child's race/ethnicity with that of the surveyed parent. Mean age for all children was  $7.8 \pm 1.3$  years. There was no significant difference in age between boys and girls ( $8.2 \pm 1.5$  vs.  $7.4 \pm 1.0$ , respectively). Although the study recruited normal-weight children, five children had measured BMI above the 85<sup>th</sup> percentile (three overweight and two obese). All 35 children were included in the analyses. Table 3 shows correlation between measured BMI and silhouette selected by the children themselves and by their parents, and correlation between silhouettes selected by the

parent-and-child pairs. A positive correlation between FRS and BMI was found among older children (aged 8-11), children whose parent spent less than \$300 on food per family per month, and children whose parent completed at least a 4-year degree. Correlation in parent-and-child silhouette selection was moderately strong (Pearson  $r=0.84$ ). However, correlation between child's BMI percentile and silhouette was weak (Pearson  $r=0.47$ ).

## **DISCUSSION**

Measured BMI for all participants was compared to the FRS. Among health professionals, FRS cut points for overweight was represented by figures 5-6 and obese was determined to be figures 7-8. Among parents, FRS cut points for overweight was represented by figure 6 and obese, figure 7. These observations are comparable to that of Bulik et al. (2). Based on the children's mean age, the overweight and obese BMI is in range of the international cut points developed by Cole et al. (12).

In this study, health professionals and parents who spent less than \$300 on food per month per family had higher mean BMIs. This agrees with the observation that lower SES is associated with higher prevalence of overweight and obesity (13,14). Work location for health professionals enhances their ability to predict their BMI category based on FRS. Registered dietitians, pediatricians, nurses, paraprofessional personal trainers and nutritionists had much higher correlations between BMI and silhouette than university faculty who teach nutrition. Frequency of exposure to the utilization of silhouette may contribute to this difference in skill.

Parental employment status significantly influences parental perception of their child's body size. Homemakers had a significant correlation between the silhouette they

selected for their surveyed child and the child's own selection, compared to unemployed, non-homemaker, or employed parents (i.e., subgroups without significant correlations). Several speculations may apply. It might be that mother's who choose to be homemakers were more perceptive of their child's weight status due to less attention otherwise required for another job. Or it might be that employed parents were less frequently exposed to various children sizes than parents who are homemakers, therefore employed parents were less experienced in selecting representative silhouette for their surveyed child.

Some parents may have an altered perception of their child's body size (10-15). Killian et al. found that minority mothers perceived their children to be thinner than their actual body size (10). In this study, we found a contradictory finding to that observation. Our Hispanic parent-and-child pairs had very similar silhouette body size selection to their measured BMI. Nonetheless, we had one Asian parent-and-child pair in the study, and the Asian parent indeed selected a smaller body size for the child than what the child has self-selected. However, this observation was based on only one case. These observations might due to cultural difference in the minority population (parents and/or children) sampled in this study compared to other minority populations sampled in other studies. Parents in this study might be more aware of and/or concern about their children's growth and health than parents who participated in other studies.

Peterson et al. reported that FRS is an effective, non-invasive, feasible technique to estimate BMI among certain populations (4). In this study, the observation is true among adults. However, despite the consistency in silhouette selection by both the parent

and the child, we found that the child FRS is not effective in children to reflect measured BMI percentile, especially among children ages 6-7 and overweight or obese children. This observation is comparable to results reported by Hale et al. (16), Kemps et al. (17), and Casey et al. (18). Younger children (ages 6-8) performed less well than older children (age 11-13) in employing a variety of cognitive tasks including: visual spatial, memory and auditory (16-18). Vuontela et al. (19) theorized that the physiological development and organization in a child's mind continues to grow throughout childhood and adolescence, accompanied by cognitive abilities development (18,19). In this study, the younger children (aged 6-7) were not cognitively mature enough to accurately select a silhouette that reflected their measured BMI. Therefore it is more practical to measure children's height and weight directly to assess BMI for children below 8 years old.

### **Limitations**

This study was limited to low-income families and health professionals in Utah. Therefore, findings can only be generalized to these populations. Due to limited funding resource, our sample size was small and could not represent the population as a whole.

### **CONCLUSION**

Adult FRS was effective in reflecting adult BMI but due to the cognitive ability of younger children, the child FRS was not as effective among children, especially ages 6-7. Therefore, it is more practical to measure the children's height and weight directly to assess BMI.

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**Table 1.** Pearson correlations between measured BMI and self-selected silhouette among health professionals in health and nutrition

<b>Parameters</b>	<b>n</b>	<b>BMI (kg/m<sup>2</sup>) (Mean±SD)</b>	<b>FRS body size # (Mean±SD)</b>	<b>Pearson r</b>
<b>All</b>	50	24.6 ± 5.8	5.0 ± 1.7	0.75**
<b>Gender</b>				
Male	14	25.9 ± 7.2	5.0 ± 1.6	0.77**
Female	36	24.1 ± 5.2	4.9 ± 1.8	0.77**
<b>Age</b>				
<21	4	22.7 ± 3.5	4.0 ± 1.4	0.94
21-50	40	24.5 ± 6.3	5.1 ± 1.7	0.78**
>50	6	22.0 ± 1.4	4.5 ± 1.8	0.22
<b>Race/Ethnicity</b>				
Asian or Asian American	3	27.4 ± 6.4	7.0 ± 2.0	1.00*
Hispanic or Latino	4	24.4 ± 1.6	4.0 ± 1.4	0.78
Non-Hispanic White	42	24.1 ± 5.7	4.8 ± 1.5	0.71**
Other	1	38.0	9.0	NA
<b>BMI</b>				
Underweight (<19)	1	18.6	2.0	NA
Normal (20-24.9)	34	21.9 ± 1.3	4.3 ± 1.1	0.30
Overweight (25-29.9)	7	25.7 ± 0.9	5.6 ± 1.1	0.42
Obese (>30)	8	35.9 ± 6.1	7.8 ± 0.9	0.18
<b>Monthly Expense on Food</b>				
\$100-299	41	25.1 ± 6.3	5.1 ± 1.8	0.78**
>\$300	9	22.3 ± 1.4	4.4 ± 1.5	0.33
<b>Education Level</b>				
Some college or technical school	13	24.6 ± 4.5	5.0 ± 1.7	0.86**
BS or BA	20	26.7 ± 7.9	5.5 ± 1.9	0.76**
RD or MD with or without graduate degrees	8	21.8 ± 1.1	3.9 ± 0.8	0.49
Graduate degrees without RD or MD	8	22.8 ± 1.7	4.8 ± 1.6	0.39
<b>Occupation</b>				
University Faculty	8	22.3 ± 1.4	4.4 ± 1.6	0.27
Health professionals at clinics and hospitals (pediatrician, RD and nurse)	10	23.6 ± 4.0	4.9 ± 1.9	0.93**
Paraprofessionals (personal trainers	32	25.5 ± 6.7	5.1 ± 1.7	0.79**

and nutritionists)

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NA, not available.

\* $p < 0.05$ , \*\* $p < 0.01$ .

<sup>a</sup>, contains missing data.

**Table 2.** Correlations between measured BMI and self-selected silhouette among parents

Parameters	n	BMI	FRS body size	Pearson r
		(kg/m <sup>2</sup> ) (Mean±SD)	# (Mean±SD)	
<b>All</b>	35	26.0 ± 4.0	5.4 ± 1.6	0.72**
Father	2	24.4 ± 0.0	3.0 ± 0.0	NA
Mother	33	26.1 ± 4.1	5.6 ± 1.6	0.74**
<b>Race/Ethnicity</b>				
Native American Indian	1	23.3	6.0	NA
Hispanic or Latino	9	28.7 ± 3.9	6.6 ± 0.9	0.68*
Non-Hispanic White	25	25.2 ± 3.8	5.0 ± 1.7	0.70**
<b>BMI</b>				
Underweight (<19)	2	19.5 ± 0.0	2.0 ± 0.0	1.00
Normal (20-24.9)	15	23.4 ± 1.0	4.6 ± 1.4	-0.03
Overweight (25-29.9)	13	27.2 ± 1.5	6.2 ± 0.7	0.28
Obese (>30)	5	33.6 ± 2.4	7.2 ± 0.4	0.41
<b>Number of children</b>				
1 or 2	17	26.0 ± 4.6	5.2 ± 2.0	0.78**
3 or more	18	26.1 ± 3.6	5.7 ± 1.1	0.64**
<b>Monthly Expenses on Food</b>				
\$100-299	8	28.1 ± 4.6	6.3 ± 1.6	0.70†
>\$300	27	25.4 ± 3.7	5.2 ± 1.6	0.70**
<b>Education Level</b>				
Did not complete high school or completed high school or GED	9	27.9 ± 3.0	5.7 ± 1.7	0.84**
Some college or technical school	15	25.8 ± 4.8	5.2 ± 2.0	0.76**
4-year degree or more	11	24.9 ± 3.4	5.6 ± 1.1	0.62*
<b>Employment Status</b>				
Homemaker	16	26.0 ± 4.4	5.8 ± 1.4	0.69**
Unemployed (non-homemaker)	12	26.1 ± 3.7	5.0 ± 1.8	0.83**
Employed part-time or full-time	7	26.2 ± 4.4	5.3 ± 1.8	0.77*

NA, not available.

\*p&lt;0.05, \*\*p&lt;0.01.

†, p=0.051.

**Table 3.** Correlation between measured BMI and silhouette selected by children ages 6-11 and by their parents, and correlation between silhouettes selected by the parent-and-child pairs

Parameters	n	BMI (kg/m <sup>2</sup> )	BMI	Body Size #	Pear-son r <sup>a</sup>	Body Size #	Pear-son r <sup>b</sup>	Pear-son r <sup>c</sup>
		(Mean±SD)	Percentile	selected by Child		selected by Mother		
<b>All</b>	35	16.3 ± 3.2	49 ± 29	3.6 ± 1.1	0.30	3.6 ± 0.8	0.31	0.64**
Boys	17	17.0 ± 4.3	47 ± 34	3.8 ± 1.0	0.37	3.8 ± 0.8	0.36	0.69**
Girls	18	15.8 ± 1.5	51 ± 24	3.4 ± 1.1	0.27	3.4 ± 0.8	0.30	0.58*
<b>Age Group (years)</b>								
6-7	15	16.9 ± 3.8	61 ± 24	3.5 ± 1.2	0.12	3.5 ± 1.0	0.26	0.77**
8-11	20	15.9 ± 2.7	40 ± 30	3.7 ± 1.0	0.53*	3.7 ± 0.7	0.47*	0.47*
<b>Parental Race/Ethnicity</b>								
Native American Indian	1	15.0	30	4.0	NA	3.0	NA	NA
Hispanic Latino	9	18.4 ± 5.0	57 ± 34	3.8 ± 1.2	0.64	3.8 ± 1.0	0.78*	0.81**
Non-Hispanic White	25	15.7 ± 2.0	47 ± 28	3.6 ± 1.0	0.14	3.6 ± 0.8	0.02	0.58**
<b>BMI Percentiles</b>								
Normal (5 <sup>th</sup> to 84 <sup>th</sup> )	30	15.5 ± 1.8	42 ± 25	3.5 ± 1.1	0.22	3.5 ± 0.8	0.07	0.64**
Overweight or obese (≥85 <sup>th</sup> )	5	21.4 ± 4.9	93 ± 3	4.2 ± 0.8	0.35	4.4 ± 0.5	0.76	0.33
<b>Number of Children</b>								
1 or 2	17	17.0 ± 3.8	50 ± 29	3.8 ± 0.9	0.14	3.6 ± 0.9	0.43	0.66**
3 or more	18	15.7 ± 2.4	49 ± 30	3.4 ± 1.2	0.41	3.6 ± 0.7	0.17	0.71**
<b>Monthly Expense on Food</b>								
\$100-\$299	8	18.4 ± 5.3	66 ± 32	3.8 ± 1.2	0.92**	3.8 ± 1.0	0.76*	0.77*
>\$300	27	15.7 ± 2.0	44 ± 27	3.6 ± 1.0	0.07	3.6 ± 0.8	0.08	0.59**
<b>Parent's Education Level</b>								
Did not complete high	9	16.8 ± 1.7	52 ± 24	3.9 ± 1.3	-0.27	3.6 ± 0.9	-0.51	0.84**

school or completed high school or GED									
Some college or technical school	15	16.8 ± 4.3	47 ± 35	3.7 ± 1.1	0.41	3.7 ± 0.7	0.63*	0.47	
4-year degree or more	11	15.4 ± 2.1	50 ± 25	3.4 ± 0.8	0.76**	3.6 ± 0.9	0.48	0.77**	
<b>Parent's Employment Status</b>									
Homemaker	16	15.4 ± 1.9	46 ± 27	3.3 ± 1.1	0.13	3.5 ± 0.9	0.06	0.73**	
Unemployed (non-homemaker)	12	16.2 ± 2.6	45 ± 32	3.9 ± 0.9	0.51	3.6 ± 0.7	0.43	0.39	
Employed part-time or full-time	7	18.8 ± 5.2	64 ± 27	3.9 ± 1.2	0.35	3.9 ± 0.9	0.61	0.74	

a, Pearson correlation between child's BMI percentile and silhouette size self-selected by the child.

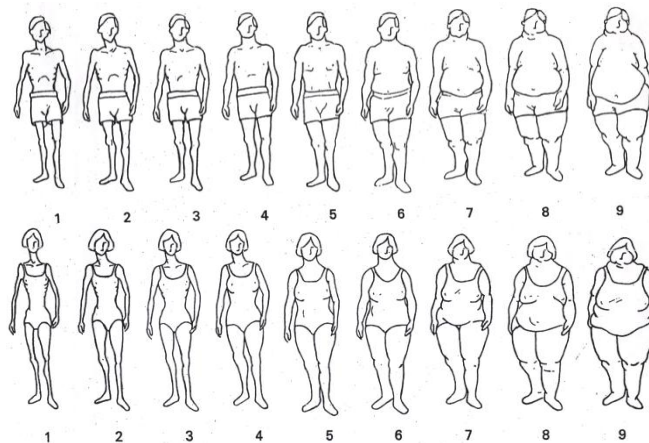
b, Pearson correlation between child's BMI percentile and silhouette size selected by the parent.

c, Pearson correlation between silhouette size selected by child and by parent.

NA, not available.

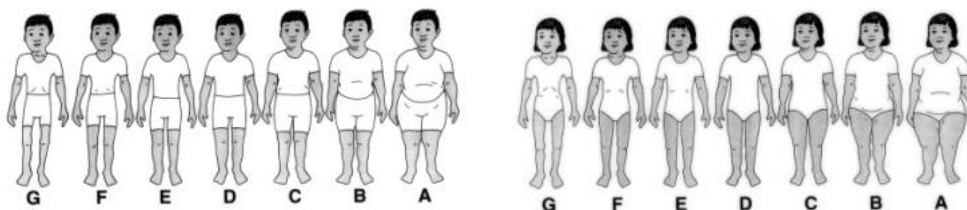
†, p=0.051.

\*p<0.05, \*\*p<0.01.

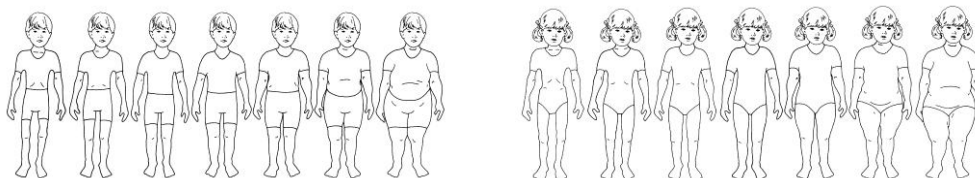


**Figure 1.** Figure Rating Scale silhouettes for adult body sizes (3) (permission received by Stunkard et al.) (19).

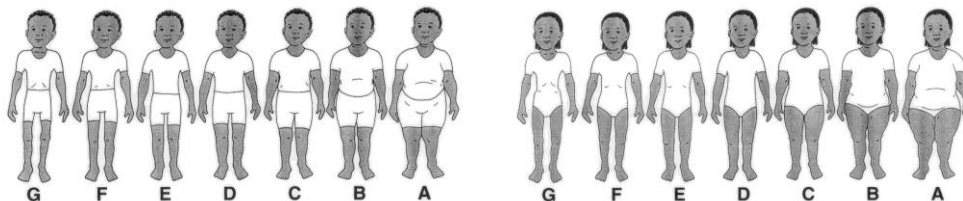
**Asian**



**Caucasian/White**



**Hispanic/Latino**



**Figure 2.** Figure Rating Scale silhouettes for children body sizes (3) (permission received by Stunkard et al.) (19).



**CHAPTER 3**  
**RESILENCY FACTORS TO CHILDHOOD OBESITY**  
**AMONG LOW-INCOME FAMILIES WITH CHILDREN AGED 6-11**

**ABSTRACT**

**Objectives:** 1) Evaluate perception of health professionals, parents and children towards 13 childhood obesity prevention recommendations, and 2) identify any discrepancies between perceptions and practicality towards these recommendations among these subgroups.

**Method:** Fifty health professionals in nutrition and 35 parent-and-child pairs were surveyed in a one-time, individual, face-to-face interview. Using a deck of 13 picture-sort health recommendation message cards, adult participants sorted them in four rounds by: 1) familiarity, 2) frequency of teaching the topic by health professionals, or following the recommendation by parents, 3) easiness to follow by health professionals or by other families (perceived by surveyed parents), and 4) effectiveness to prevent childhood obesity. Children chose messages that their family followed. Descriptive statistics and t-tests were run.

**Results:** In Round 1, health professionals and parents had similar familiarity in all 13 messages. But in Round 2, they significantly differed in eight messages that were “always taught/followed,” six messages that were “sometimes taught/followed,” and two messages that were “seldom or never taught/followed” by health professionals and parents, respectively. In nine messages, children’s observation on what the family followed significantly differed from what parents reported following. In Round 3, health

professionals and parents differed significantly in two messages. In round 4, health professionals and parents agreed on 12 of 13 messages.

**Conclusion:** It is important for health professionals to adapt their teaching by integrating identified practical ways to prevent childhood obesity among low-income families to maximize program impact.

## **INTRODUCTION**

Obesity is defined as an excess proportion of total body fat. When a person's weight is 20% or more above normal weight, it is considered obese (1). Obesity is commonly measured by the body mass index (BMI) (1,2). The BMI is a formula based on a person's weight measured in kilograms divided by a person height measured by meters squared ( $\text{kg}/\text{m}^2$ ) (2). For adults, a BMI between 25.0 and 29.9 is considered overweight; a BMI between 30.0 and 34.9 is considered obese, and a BMI of 35 or more is considered morbidly obese (2). For children, a growth chart is used in conjunction with the child's measured BMI to determine if the child is overweight (3,4). Using the growth chart, a child's percentile is determined (4). This is done by comparing a child's BMI with other children of the same age and gender (4). The Center for Disease Control and Prevention determined that when a child's BMI for age is between the 85<sup>th</sup> and the 94<sup>th</sup> percentiles, the child is considered overweight; if the child's BMI for age is at the 95<sup>th</sup> percentile or above, the child is considered obese (4).

The prevalence of obesity has increased in both children and adults (5). Approximately 33% of all American adults are obese, and 16% of children between the ages of 6 and 19 are considered obese (5,6). Over the past three decades, the rate of

childhood obesity has more than doubled for preschool children ages 2-5 and adolescents ages 12-19, and it has more than tripled for children ages 6-11 (7). Obesity affects many minority youth populations as well. The National Health and Nutrition Examination Survey (NHANES) found that 21% of African American and 23% of Mexican American adolescents ages 12-19 were more likely, than non-Hispanic White adolescents (14%) to be overweight (7). In children ages 6-11, 22% of Mexican American, 20% of African American, and 14% non-Hispanic White children were overweight (7). Utah ranked the 50<sup>th</sup> (23.1%) and 44<sup>th</sup> in childhood and adult obesity (22.5%), respectively, in the nation (8).

### **Contributing Factors of Obesity**

Many studies have attempted to identify specific food or dietary patterns that contribute to excessive caloric intake in children (9). Large portion sizes for food and beverages, eating meals away from home, frequent snacking on energy-dense foods, and consuming sugar-sweetened beverages are often used as a determining factor for excess energy intake of children (9,10). In the area of consuming sugar-sweetened beverages, evidence is growing to suggest a positive association with weight gain in children (11,12). Consuming sugar-sweetened beverages may be associated with obesity because these beverages are high in calories (12).

Rennie et al. conducted a cross-sectional study of 100 children aged 6-8, and found that active energy expenditure and physical activity were negatively associated with body fatness among children (13). Pate et al. reported that one-third of American children were not meeting the recommended levels of moderate or vigorous physical

activity, 10% were inactive, and physical activity level dropped as the child grew older (14). Television, video games, and computer use consume a large proportion of children's time, thus affecting their physical activity levels (15). On average, it is estimated that a child spends over three hours per day with these electronic devices regularly (16).

Several parental influences affect the health habits of youth. If one or both parents are overweight, the child is 73% more likely to be overweight than children who have both parents with healthy weight (17). In children ages 4-10, parental obesity is a more potent risk factor than the child's own weight status in predicting whether or not the child will become an obese adult (17). Whitaker et al. noted that obese children under the age of three without obese parents are at a lower risk for obesity in adulthood. However, parental obesity more than doubles the risk of adult obesity among both obese and non-obese children below age 10 (18).

The foods available to the child, the amount of time the child is left unsupervised, and the child's eating interactions with other children are all influential by the parent (19). Also, a parent's food preference can influence the food preference of their children (19). Parents who ate diets high in saturated fats also had children who ate diets high in saturated fats (20). It is believed that this observation is not only due to the foods parents feed their children, but also due to the preferences children developed through exposure to foods that their parents provided early in the child's life (21). Studies agree that the availability of fruits and vegetables in a home are positively associated with fruit and vegetable preferences and consumption by children (22). In addition, studies have shown

that when a parent attempts to control what and how much a child eats, it also affects the child's food preference (23). Birch and Fisher determined that parents who attempt to encourage or discourage the consumption of certain foods may affect the child's preference to those foods (23).

Obesity results from a complex interaction between diet, physical activity, and the environment. The built environment is defined as "a range of physical and social elements that make up the structure of a community and may influence obesity" (24). For example, a lack of sidewalks, safe bike paths, and parks in neighborhoods can discourage children from participating in physical activity (25). Additionally, lack of affordable, healthy food choices in neighborhood markets can be another obstacle in purchasing healthy foods (25).

This study was designed to determine if families who have normal-weight children are putting the preventive messages about childhood obesity into practice in their homes. By examining four key areas: 1) health professional and families' familiarity to these health messages, 2) their frequency in teaching (by the health professionals) or practicing (by the parents) them, 3) their perception in easiness to follow by other families, and 4) their perception in obesity prevention effectiveness, this study will help determine the practicality of messages told to low-income families by health professionals in order to prevent childhood obesity.

## **METHODS**

This study was part of a larger study named the Help in Overweight/Obesity Prevention Efforts (HOPE) Study 1. HOPE Study 1 is part of a National Institutes of

Food and Agriculture (NIFA) multistate study, W-1005, entitled “An integrated approach to prevention of obesity in high risks families.” Methods and procedures of this study have been reviewed and approved by the Utah State University Institutional Review Board, the Cache County School District, the Granite School District and the Davis County School District (Appendix A). Prior to this study, all adult and youth participants completed an informed consent (Appendix B) (Appendix C). The study occurred between September 2008 and June 2009 in Utah consent.

### **Health Message Picture-Sort Cards**

A picture-sort method was used to assist in the interview session. Each card consisted of a health message related to obesity prevention and relevant photo (Appendix J). All picture-sort card of a health message related to obesity prevention and a relevant photo. All picture-sort cards and messages were tested for face validity with a focus group for formative evaluation. Thirteen health messages related to obesity prevention were used. The child’s version contained slightly different wording (Appendix K), which was tested in a focus group consisting of 12 children aged 6-11.

1. Decrease intake of sweetened beverages.
2. Watch portion sizes.
3. Eat out less often.
4. Make wise snacking choices.
5. Eat breakfast every day.
6. Eat less food with empty calories.
7. Eat more fruit, vegetables and whole grain foods.

8. Allow children to eat all foods brought into the home.
9. Choose healthful foods when eating out.
10. Tell children to eat all of the meal before getting dessert.
11. Eat together as a family.
12. Spend less time with computers and video games.
13. Watch less TV and videos.

### **Health professionals Recruitment**

In this study, the term health professional is defined as any individual who interacts directly with a parent-child pair at various capacities while teaching health and nutrition in a professional setting. By word of mouth, 50 health professionals in health and nutrition from Extension and the community of all ages and both genders were recruited in four counties: Cache, Weber, Davis, and Salt Lake. Through a referral system (snowballing effect), existing health professionals were contacted and then asked to refer other health practitioners and educators to participate in the study.

### **Health Professionals Interview**

At a one-time, face-to-face interview, each health professional completed a paper questionnaire about demographics, including monthly expense on food, their teaching location, clientele's race and age range (Appendix D). Clothes-on body weight was measured with a portable digital scale displaying up to one decimal point, and height with shoes on was measured with a fabric measuring tape, straightly taped against a flat wall.

The health professional was then asked a series of questions regarding four key areas (mentioned on page 52) using the picture-sort cards. The entire interview was audio taped and each oral response was transcribed onto a data sheet (Appendix L).

### **Parent-Child Pairs Recruitment**

Of 500 families reached by using take-home fliers and a letter (Appendix F) approved by school districts board of participating Title 1 schools, 35 low-income families participated. These families consisted of at least one parent and a parent-perceived-normal-weight child aged 6-11 who live together. Screening for eligibility by income level was based on the 2009 poverty guidelines (Appendix G). We telephoned and/or emailed parents who were interested in participating to schedule an interview.

### **Parent and Child Interviews**

Each parent and child was interviewed separately in the same, one-time, face-to-face visit. The parent completed a paper questionnaire about demographics, including monthly expense on food, the name, age, and gender of the surveyed child, and of all other children ages 6-11 (Appendix H). For BMI, parent and child's body weight and height were measured using the same method for health professionals.

The parent was asked a series of questions regarding four key areas (mentioned on page 52) using the picture-sort cards. Then, to cross check, the child was asked about the frequency each message was practiced by his/her family, using the child version picture-sort cards. The entire interview session was audio-recorded and oral response was transcribed onto a data sheet (Appendix M).



During the same visit, an additional picture-sort survey was conducted with the surveyed child. Each child was asked to sort 27 food photos of empty-calorie foods to a “yes” or “no” pile based on their consumption in the past 24 hours. The list of foods include:

- |                      |                     |                       |
|----------------------|---------------------|-----------------------|
| 1. Otter pops        | 10. Soda pop        | 19. Hamburger         |
| 2. Crackers          | 11. Cookies         | 20. Popcorn           |
| 3. Fruit snacks      | 12. Pizza           | 21. Ice cream         |
| 4. Granola bars      | 13. Slurpee or Icee | 22. Chicken nuggets   |
| 5. Cold cereal       | 14. Cake            | 23. Juice in a glass  |
| 6. Popsicles         | 15. Doughnuts       | 24. Drinks in a pouch |
| 7. Potato chips      | 16. Candy           | 25. Tacos             |
| 8. Punch or lemonade | 17. Pop tarts       | 26. Drinks in a box   |
| 9. Candy bar         | 18. French fries    | 27. Pie               |

In Round 1, the child was asked to recall if he or she had eaten these foods in the past 24 hours. If yes, then the child sorted the food photo into the “yes” pile; if not, the child sorted the food photo into the “no” pile. In Round 2, the child was asked to recall how much of each food sorted in the “yes” pile was eaten. In Round 3, the child was asked to recall how often he or she ate foods from the “no” pile. The entire interview session was audio-recorded and oral response was transcribed onto a data sheet (Appendix N).

### **Statistical Analysis**

Statistical analyses were run using the Statistical Package for the Social Sciences (SPSS 18.0; Prentice Hall, Upper Saddle River, New Jersey). Descriptive statistics were

generated for all demographic variables. T-tests were used to compare the effectiveness and perceived effectiveness of the health messages for all individual participants. Alpha levels for p-values were set at 0.05. With 95% confidence level (alpha level 5%), the statistical power to detect a 14% average difference between 50 health professionals and 35 parents was 62% (one-tailed test); and the statistical power to detect a 23% average difference between 35 parents and 35 children was 81% (one-tailed test).

## **RESULTS**

### **Health Professional's Demographic Characteristics**

Among 50 health professionals interviewed, 28% were male and 72% were female. There were 84% Whites; 8% Hispanics/Latinos, 6% Asians, and 2% unknown. Mean age was  $30.4 \pm 12.9$  years; 2% were underweight (BMI <19), 68% were normal-weight (BMI 19-24.9), 14% were overweight (BMI 25-29.9), and 16% were obese (BMI >30). There were 28% who had some college or technical school trainings, 40% completed a bachelor's degree, 16% were registered dietitian with or without a master's degree, 4% with a master's degree, 12% had a doctorate degree, and 2% did not specify an education level. In terms of occupation, 64% health professionals were paraprofessionals (personal trainers and nutritionists), 16% were faculty members at multiple accredited universities in Utah, 14% were practicing Registered Dietitians, and 6% were health professionals in clinics and hospitals (pediatrician, registered dietitians and nurse).

### **Parent's Demographic Characteristics**

Among 35 parents interviewed, 6% was male, 94% was female. Because of the low percentage of male parent participants, they were excluded from data analyses. The remaining research data focused on the female parent participants (n=33). Through self-report, there were 72% Whites, 25% Hispanics/Latinos, and 3% Native Americans. Forty-five percent mothers were healthy-weight, 37% were overweight, and 18% were obese. Three percent mothers did not complete high school, 18% received a high school diploma or GED, 45% received some college or technical school, and 33% received a 4-year degree or more. Forty-nine percent were homemakers, 30% were unemployed (but non-homemakers), 12% were employed part-time, and 9% were employed full-time.

### **Children's Demographic Characteristics**

Among 35 children interviewed, 49% was male and 51% was female. Mean age was 6.7 years. Based on measured BMI, 85% children were healthy-weight, 9% were overweight, and 6% were obese.

### **Comparisons Between Health Professionals and Parents**

Figure 1 compares the level of familiarity to each of the 13 messages between health professionals and parents. The health professionals were most familiar with these messages: "Eat Breakfast Everyday" and "Eat more fruits, vegetables and whole grains." Parents were most familiar with these messages: "Decrease intake of sweetened beverages" and "Choose healthful foods when eating out." The children were not asked

if they were familiar with the health messages. There was no significant difference between the familiarity of each message among health professionals and parents.

Figure 2 compares the frequencies of health professionals teaching these health recommendations, the frequencies of parents following these recommendations, and the frequencies of children agreeing that their families follow these recommendations. Ninety-eight percent of health professionals reported always teaching the message “Eat more fruits, vegetables and whole grains.” Eighty-five percent of the parents reported always following the message “Eat breakfast everyday.” Eighty-three percent of the children reported always observing their families following the message “Make wise snacking choices.”

In terms of messages always taught by health professionals compared to always following the messages by parents, there was a significant difference in 8 messages (1, 2, 3, 5, 7, 11, 12, and 13). In terms of messages sometimes taught by health professionals compared to sometimes following the messages by parents, there was a significant difference in 7 messages (1, 2, 4, 6, 7, 9, and 13). In terms of messages seldom/never taught by health professionals compared to seldom/never following the messages by parents, there was a significant difference in 2 messages (8, and 10).

Figure 3 compares the perception towards the ease for others to follow these messages by health professionals and parents. Seventy-two percent of the health professionals believed that the message “Eat breakfast everyday” was the easiest message for most families to follow. Ninety-four percent of the parents believed that the message “Tell children to eat all of the meal before getting dessert” was the easiest message for

most families to follow. There was a significant difference among two messages: “Watch portion sizes” and “Tell children to eat all of the meal before getting dessert.”

Figure 4 compares health professional and parental perception toward the effectiveness of each recommendation in preventing childhood obesity. Health professionals believed that messages “Decrease intake of sweetened beverages” and “Eat less foods with empty calories” are the most effective messages in helping a child maintain a healthy weight. Parents believed that the message “Make wise snacking choices” is the most effective message in helping a child maintain a healthy weight. There was a significant difference among the message “Tell children to eat all of the meal before getting dessert.”

## **DISCUSSION**

This study aimed to evaluate the practicality of commonly heard health messages about childhood obesity prevention among the low-income families, and to assess consumption of empty-calorie foods by children of healthy weights. Practicality may be defined as a functional way to apply these messages directly to the lives of low-income families.

Many studies have focused on the effectiveness of each message separately (11,18, 26-28). Dietz et al. evaluated the effects of television viewing on childhood obesity and found that for every hour of television viewed, the prevalence of obesity increased by 2%. Likewise, activity levels declined while consumption of energy-dense foods increased among low income populations (27). A literature review conducted by Drewnowski et al. found that the highest rates of obesity occurred among low-income

populations and that food high in refined grains, added sugar and fat are more affordable to consumers. Drewnowski et al. also observed that lower food expense led to low fruit and vegetable consumption and poor diet quality (28).

In this study it is interesting to note that when comparing the familiarity of each message, there was not a significant difference found among health professionals and low-income families. When asked how often the family followed each health message, among most messages, the children differed from their parents in perception of how often a recommendation was followed. For example, when asked if the family “Eats out less often,” “Eat breakfast everyday,” “Eat more fruits, vegetables and whole grains,” or “Eat together as a family,” one-third of the children stated their family did not follow these recommendations, whereas all of the parents interviewed stated that they at least “sometimes” followed these recommendations. Likewise, when asked if the family “Decreases the intake of sweetened beverages,” 20% of children said their family did not follow this recommendation in comparison to 100% of the parents who stated they at least “sometimes” followed this recommendation. Also, when asked if the family “Spends less time with computers and video games” or “Watch less TV and videos,” approximately 50% of children reported their family did not follow either one recommendation in comparison to 6% and 18%, respectively, of parents who said they did not follow this recommendations. This difference in observation of how often a message was followed at home might occur due to various reasons. One, the child might not be fully aware of the efforts the parent made to adhere to these principles (in which the parent(s) might have role modeled it more often). Two, the child might not fully

understand the message and failed to communicate the need for further clarification.

Three, the parent might have felt the need to not be truthful in reporting the frequency each message was followed due to a perceived judgment or bias of the evaluator.

When comparing how often the health professional taught a health recommendation to how often the family followed the health message, more than 80% of health professionals stated they always taught these messages: “Decrease intake of sweetened beverages,” “Watch portion size,” “Eat more fruits, vegetables and whole grain foods” and “Watch less TV and videos,” but slightly less than half the parents stated they always followed these principles. This observation might be due to a misunderstanding of how to apply these principles in the lives of the low-income families. Or the families might view these messages too difficult to apply in their homes.

More than 70% of health professionals say they never taught the recommendation to “Allow children to eat all foods brought into the home” and “Tell children to eat all of the meal before getting dessert” but as many as 30% and 42%, respectively, of parents reporting “always” following these recommendations. This observation might be due to the fact that the message “Allow children to eat all foods brought into the homes” was viewed differently among many health professionals and parents. Many health professionals when asked why they never taught this message, believed it would require an emphasis on bringing only healthy foods into the home and eliminating unhealthy foods brought into the home. The children’s interpretation (Appendix E) was helpful in seeing the wisdom or good intension of this message, i.e., “Buy only foods you want your kids to eat.”

Likewise, for the message “Tell children to eat all of the meal before getting dessert,” many health professionals stated that this is an “out-dated” message that encourage making energy-dense foods appear as a reward and therefore more desirable than nutrient-dense foods. Many health professionals also stated that by enforcing this message, parents are causing their children to ignore the natural satiety signals in their own bodies, and overeat. On the other hand, parents who reported following these messages, often stated that they inherited these principles/ideas from their own parents, which they believed were effective in maintaining a healthy weight in the family

When considering the ease for other low-income families to follow each health recommendation, percentages of health professional’s perceived easiness for other low-income families to follow these health recommendations ranged from 28% to 72%. Health professionals and parents significantly disagreed in only two recommendations. Twenty-eight percent of health professionals vs. 9% of parents said this was easy for other low-income families to “Watch portion size” ( $p<0.05$ ). Forty-four percent of health professionals vs. 94% of parents said this was easy for other low-income families to “Tell children to eat all of the meal before getting dessert” ( $p<0.001$ ). The difference in observation of ease for the message “Watch portion size” might due to the misunderstanding of an accurate portion size among families. Or it might due to the cultural belief on the importance of large portion size. The difference in observation of ease for the message “Tell children to eat all meal before getting dessert” was due to the fact that many health professionals no longer found this an appropriate message to teach.



When considering the effectiveness of the health message to prevent childhood obesity among low-income families, the only significant difference between health professionals (48%) and parents (73%) was the message “Tell children to eat all of the meal before getting dessert” ( $p < 0.005$ ). This observation might be due to the growing belief among health professionals that this was no longer a correct principle and that this message encouraged making energy-dense foods appear as a reward and therefore more desirable than nutrient-dense foods.

## **CONCLUSION**

A statement released by the Council on Sports Medicine and Fitness along with the Council on School Health stated that Health professionals play an important role in advocating for change that support healthy nutrition, reduce sedentary time to families in their practice (26). Although many approaches have been made in educating families about creating and maintaining a healthy lifestyle for their children, particularly among low-income families, there is still a gap in understanding the practicality and effectiveness of certain health recommendations at the family and individual levels. It is important for health professionals to identify practical ways to prevent childhood obesity among low-income families by hearing their feedback in order to maximize childhood obesity prevention of among this high-risk population.

## **Limitations**

The current study was limited to low-income families living in selected counties in Utah, and a convenient sample of health professionals who worked within these

sampling counties. Therefore, findings from this study can only be generalized to these populations. The study sample size was relatively small and may not represent the low-income population as a whole. Further studies should take a more comprehensive approach to survey a larger sample to better understand the practicality and effectiveness of common health recommendations for preventing childhood obesity.

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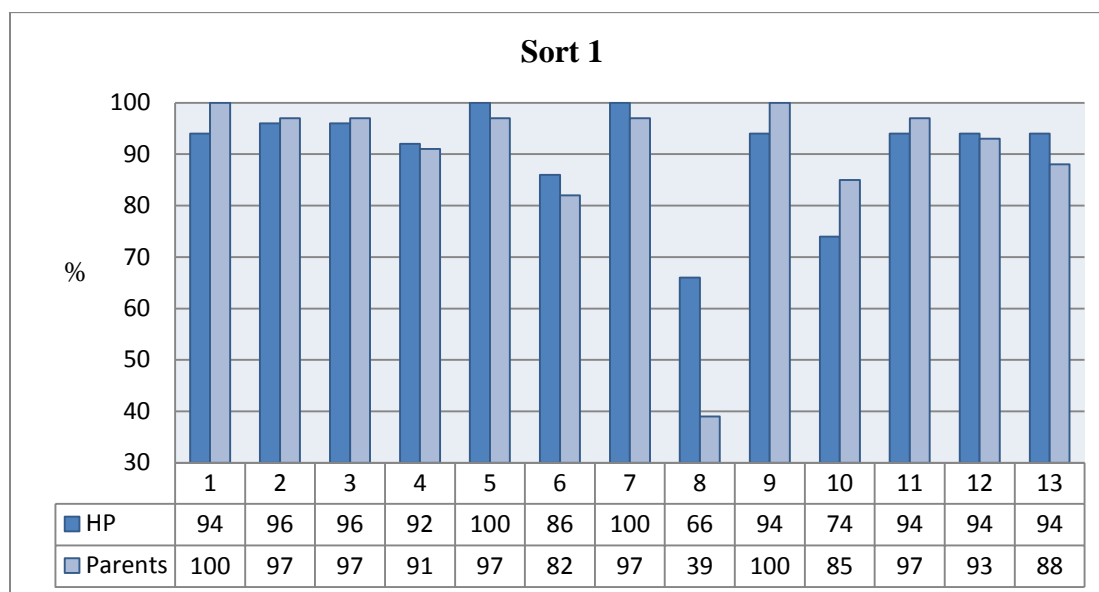
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**Table 4 .** Percentage of the frequency of unhealthy foods consumed by healthy-weight children.

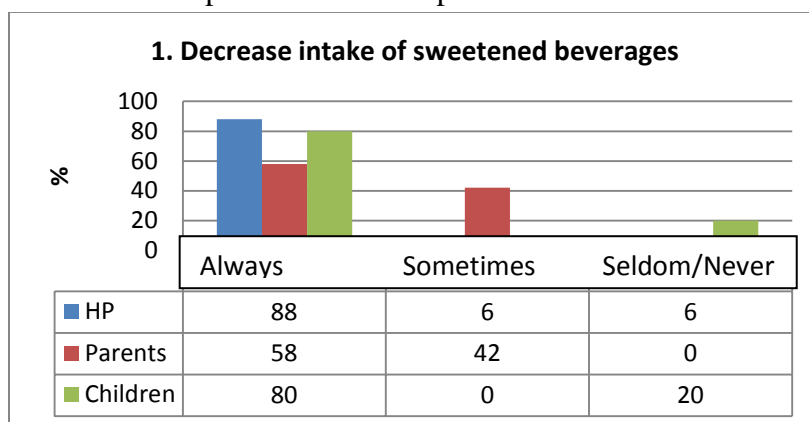
<b>Food</b>	<b>Almost every day</b>	<b>A few times a week</b>	<b>A couple times a month</b>	<b>Almost never</b>
1. Juice in a glass	31.4	25.7	28.6	14.3
2. Drinks in a box	8.6	25.7	22.9	42.9
3. Drinks in a pouch	14.3	31.4	34.3	20.0
4. Soda pop	17.1	8.6	31.4	42.9
5. Popsicles	2.9	37.1	42.9	17.1
6. Otter pops	5.7	28.6	31.4	34.3
7. Punch or Lemonade	14.3	11.4	31.4	42.9
8. Slurpees or Icees	8.6	17.1	25.7	48.6
9. French Fries	2.9	31.4	45.7	20.0
10. Hamburgers	8.6	20.0	40.0	31.4
11. Chicken Nuggets	40.0	0.0	20.0	40.0
12. Tacos	5.7	20.0	31.4	42.9
13. Pizza	8.6	40.0	37.1	14.3
14. Candy	17.1	20.0	42.9	20.0
15. Cookies	5.7	51.4	31.4	11.4
16. Cake	20.0	5.7	54.3	20.0
17. Pie	8.6	8.6	42.9	40.0
18. Ice Cream	2.9	31.4	40.0	25.7
19. Pop Corn	20.0	31.4	37.1	11.4
20. Granola Bars	8.6	54.3	22.9	14.3
21. Potato Chips	20.0	37.1	31.4	11.4
22. Crackers	8.8	51.4	31.4	8.6
23. Fruit Snacks	20.0	28.6	25.7	25.7
24. Doughnuts	5.7	17.1	34.3	42.9
25. Pop Tarts	2.9	14.3	37.1	45.7
26. Cold Cereal	40.0	40.0	20.0	0.0

**LEGEND:** HP = health professionals

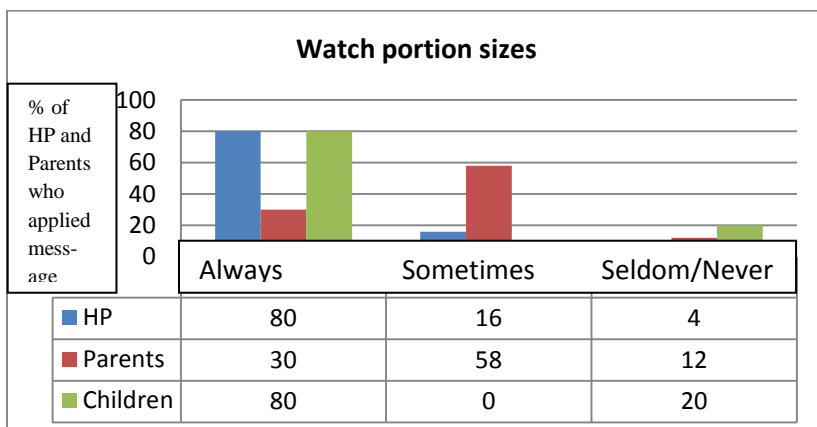


**Figure 3.** Percentage of familiarity with health messages among health professionals and parents. No significant difference between HP and parents in all messages.

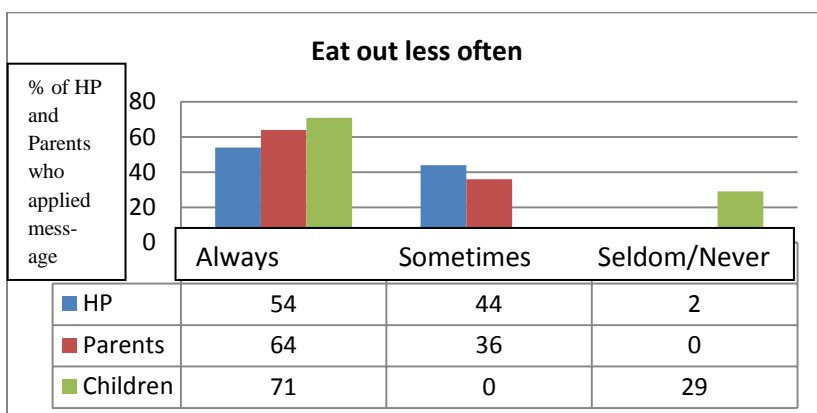
**Figure 4(a-m).** Comparisons of frequency in following prevention recommendation between health professionals and parents.



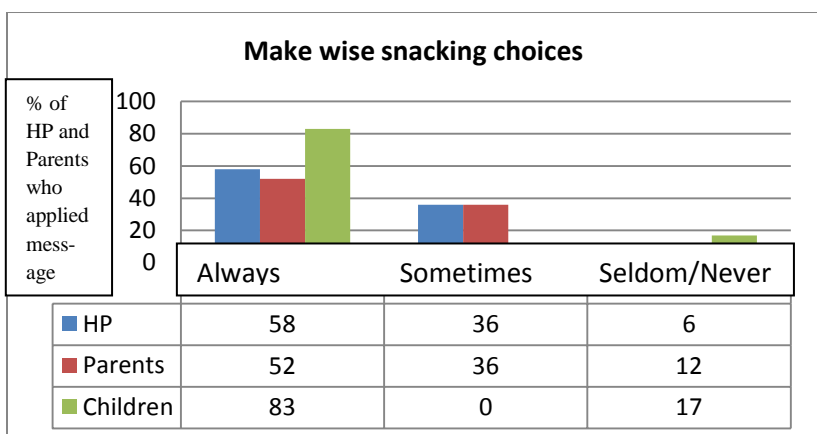
(a) Percentage of HP and parents who applied Message 1. HP and parents differed significantly in “Always” ( $p < 0.001$ ) and “Sometimes” ( $p < 0.001$ ). Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p < 0.01$ ).



(b) Percentage of HP and parents who applied Message 2. HP and parents differed significantly in “Always” ( $p<0.001$ ) and “Sometimes” ( $p<0.001$ ) and “Seldom/Never” ( $p<0.05$ ).

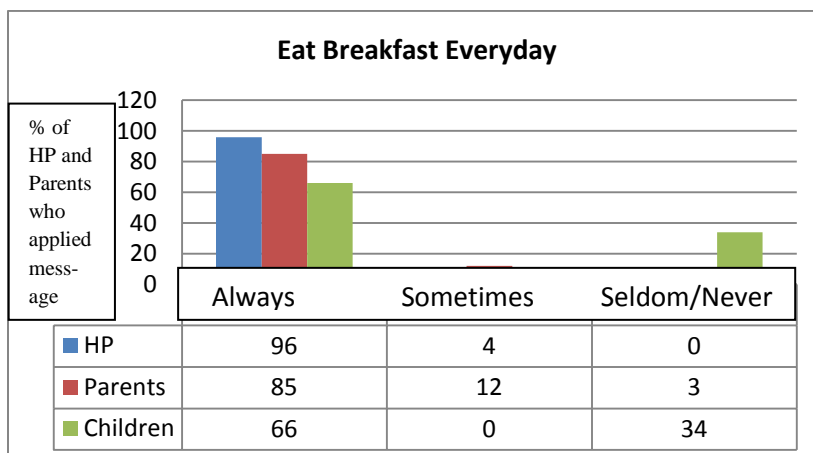


(c) Percentage of HP and parents who applied Message 3. No significant differences between HP and parents. Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p<0.01$ ).



(d) Percentage of HP and parents who applied Message 4. No significant differences between HP and parents.

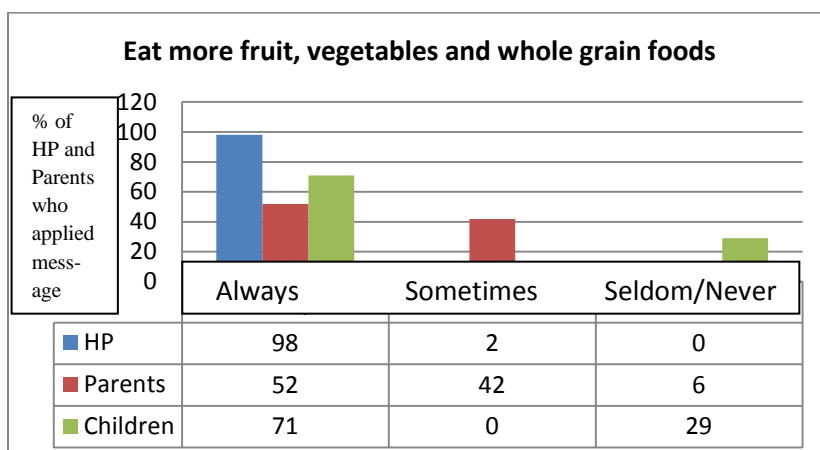




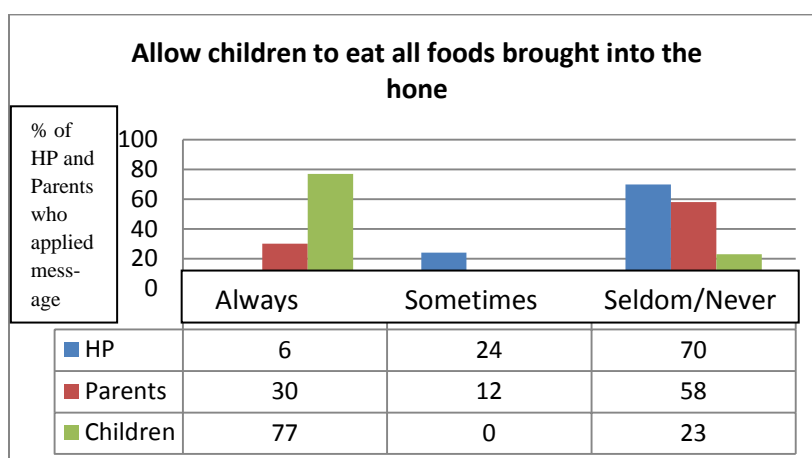
(e) Percentage of HP and parents who applied Message 5. No significant difference between HP and parents. Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p < 0.01$ ).



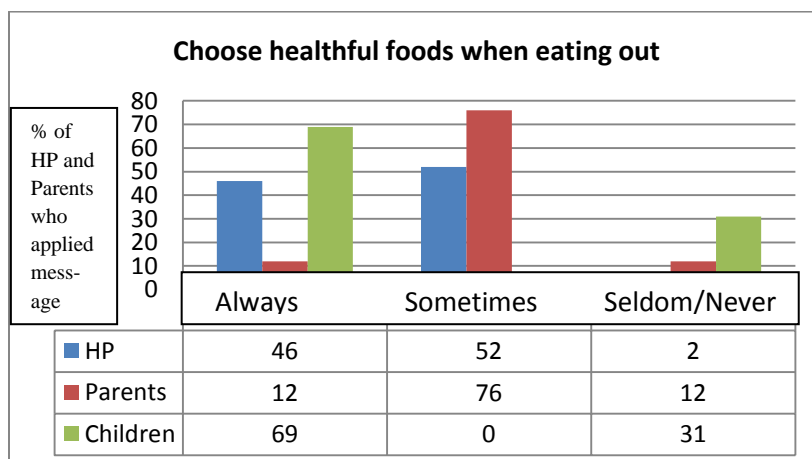
(f) Percentage of HP and parents who applied Message 6. HP and parents differed significantly in “Always” ( $p < 0.001$ ) and “Sometimes” ( $p < 0.001$ ). Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p < 0.01$ ).



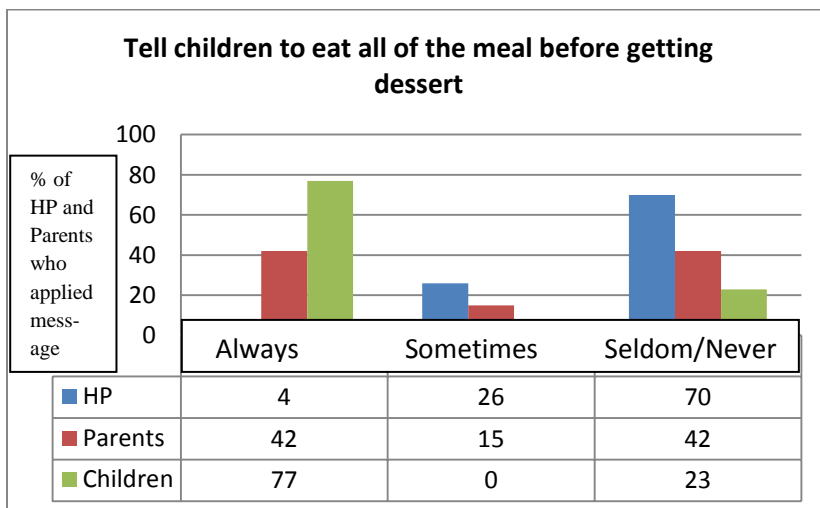
(g) Percentage of HP and parents who applied Message 7. HP and parents differed significantly in “Always” ( $p < 0.001$ ) and “Sometimes” ( $p < 0.001$ ). Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p < 0.01$ ).



(h) Percentage of HP and parents who applied Message 8. HP and parents differed significantly in “Always” ( $p < 0.001$ ).



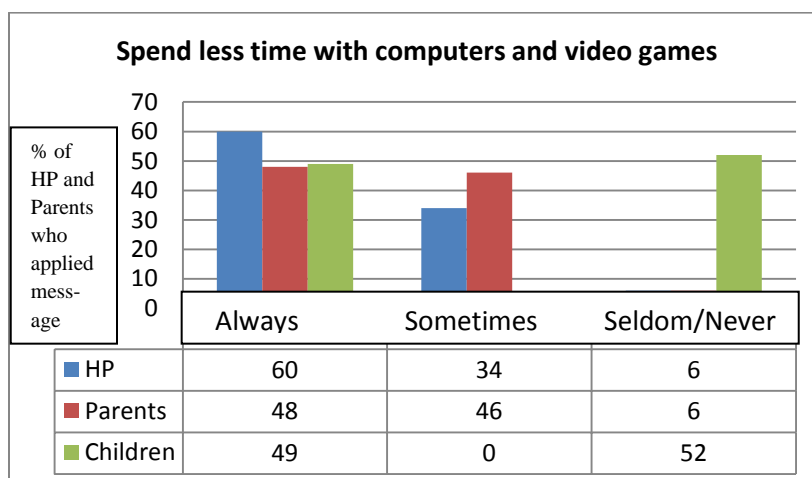
(i) Percentage of HP and parents who applied Message 9. HP and parents differed significantly in “Always” ( $p<0.001$ ) and “Sometimes” ( $p<0.001$ ). Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p<0.05$ ).



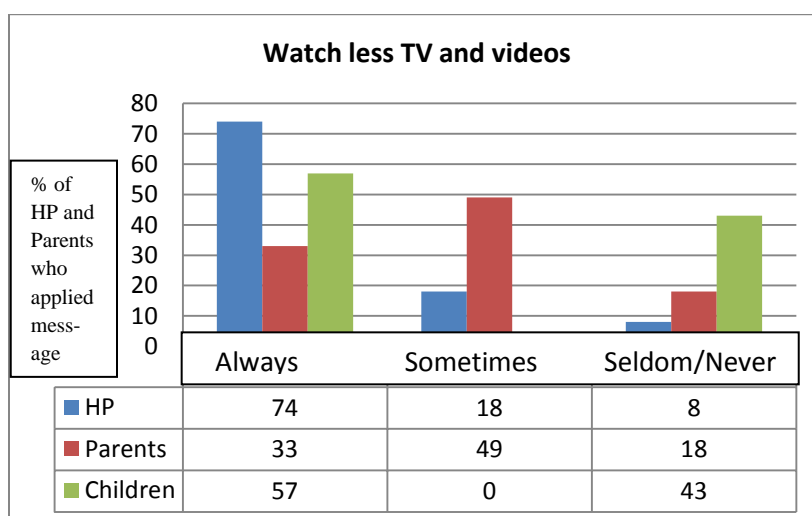
(j) Percentage of HP and parents who applied Message 10. HP and parents differed significantly in “Always” ( $p<0.001$ ) and “Seldom/Never” ( $p<0.05$ ).



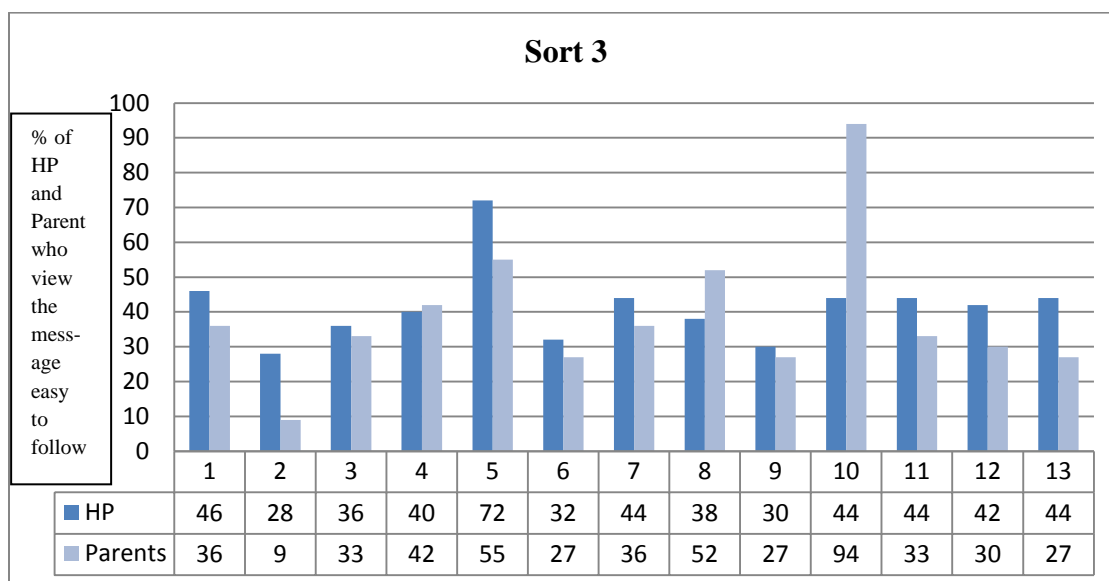
(k) Percentage of HP and parents who applied Message 11. No significant differences between HP and parents. Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p<0.01$ ).



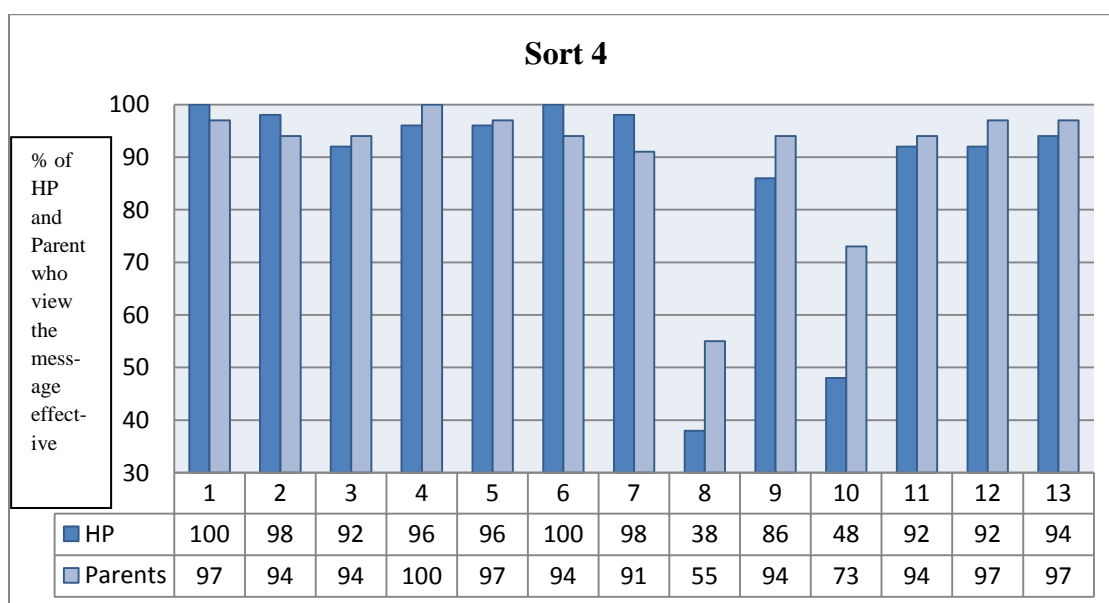
(l) Percentage of HP and parents who applied Message 12. No significant differences between HP and parents. Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p < 0.01$ ).



(m) Percentage of HP and parents who applied Message 13. HP and parents differed significantly in “Always” ( $p < 0.001$ ) and “Sometimes” ( $p < 0.001$ ). Parents combined “Always” and “Sometimes” differed significantly with children’s “Yes” ( $p < 0.01$ ).



**Figure 5.** Percentage of the belief of ease to follow each message among health professionals and parents. HP and parents differed significantly in messages 2 ( $p < 0.05$ ) and 10 ( $p < 0.001$ ).



**Figure 6.** Percentage of the belief of effectiveness in preventing childhood obesity among health professionals and parents. HP and parents differed significantly in message 10 ( $p < 0.01$ ).

## CHAPTER 4

### SUMMARY AND CONCLUSION

Through two pilot studies, this thesis project fulfilled the goal to gain knowledge in the field of community nutrition, particularly about practical ways to reduce and/or prevent childhood obesity among low-income audience in Utah. The literature review focused on the prevalence, contributing factors, co-morbidity and consequences, and health recommendations for childhood obesity. The review also examined the accuracy of Figure Rating Scale (FRS) in reflecting body mass index (BMI).

The first study focused on the FRS. This study aimed to determine a correlation between FRS and measured BMI among health professionals, low-income parents and children. Result showed that the adult FRS was effective in reflecting BMI among adult participants. However, the child FRS was not effective in reflecting BMI among children, especially ages 6-7. As a result, whenever possible, it is more practical to measure the children's height and weight directly to assess BMI, especially among children ages 6-7.

The second study focused on 13 common health message taught to low-income families by health professionals in nutrition and health sciences. This study aimed to: 1) determine the practicality of 13 commonly heard health messages in preventing childhood obesity by interviewing health professionals and low-income families, and 2) assess sweet intakes of the surveyed child to crosscheck their responses in seeing their family follow these recommendations. In Round 1, result showed that health professionals and parents had similar familiarity in all 13 messages. However, the health

professionals were most familiar with these messages: “Eat Breakfast Everyday” and “Eat more fruits, vegetables and whole grains. Parents were most familiar with these messages: “Decrease intake of sweetened beverages” and “Choose healthful foods when eating out.” In Round 2, health professionals and parents differed in eight messages that were ‘always taught/followed’; seven messages that were ‘sometimes taught/followed’, and two messages that were ‘seldom or never taught/followed’ For almost all messages, children’s observation on what the family followed differed from what parents reported following. Ninety-eight percent of health professionals reported always teaching the message “Eat more fruits, vegetables and whole grains.” Eighty-five percent of the parents reported always following the message “Eat breakfast everyday.” Eighty-three percent of the children reported always observing their families following the message “Make wise snacking choices.” In Round 3, health professionals and parents differed in two messages in terms of their easiness for other families to follow to prevent childhood obesity. Seventy-two percent of the health professionals believed that the message “Eat breakfast everyday” was the easiest message for most families to follow. Ninety-four percent of the parents believed that the message “Tell children to eat all of the meal before getting desert” was the easiest message for most families to follow. In round 4, health professionals and parents agreed on 12 of 13 messages. Health professionals believed that to “Decrease intake of sweetened beverages” and to “ Eat less foods with empty calories” are the most effective messages in helping a child maintain a healthy weight. Parents believed that to “Make wise snacking choices” is the most effective message in helping a child maintain a healthy weight.

From the practicality standpoint, these studies found new areas for health professionals to refocus when educating low-income families to prevent childhood obesity. In conclusion, it is important for health professionals to be aware of and align informed practical ways by their low-income audience to prevent childhood obesity in a more effective way to maximize program impact.



**APPENDICES**

Appendix A. Assurance Letter To School Districts



Department of Nutrition and Food Sciences  
8700 Old Main Hill  
Logan, UT 84322-8700  
Telephone: (435) 797-2126  
Fax: (435) 797-2379

October 9, 2008

Michael E. Monson, PhD  
Research Committee Chair  
Logan City School District  
101 West Center  
Logan, UT 84321-4520

Dear Michael Monson,

Thank you for permitting research to be conducted at the local elementary schools. This letter is to offer you an assurance that no school will be targeted or referred to by name as being low socio-economic or as a poverty school. Also no research will be conducted during school hours or on school property without administrative consent. The schools that wish to be contacted are the following: Woodruff, Ellis, Bridger, River Heights, Hillcrest, and Wilson Elementary schools. All work with the schools will be conducted through the building principals of each school.

Please contact me if you have any questions or concerns.

Sincerely,

Rebecka Bagwell  
Research Assistant  
Department of Nutrition and Food Sciences

## Appendix B. Informed Consent Form for Families



Department of Nutrition and Food Sciences  
 8700 Old Main Hill  
 Logan, UT 84322-8700  
 Telephone: (435) 797-2126  
 Fax: (435) 797-2379

Date Created: June 18, 2006; Page 1 of 2  
 USU IRB Original Approval 06/19/2007  
 Approval terminates 06/18/2009  
 Amend. #1 Approved 07/30/2008; Protocol Number 1836  
 IRB Password Protected per IRB Administrator

### Informed Consent

#### Help in Overweight/Obesity Prevention Efforts (HOPE) Study

**Introduction/ Purpose** Professors Heidi Wengreen and Siew Sun Wong in the Department of Nutrition and Food Sciences at Utah State University (USU) are conducting a research study to find out more about the practicality of weight prevention health messages. You have been invited to participate because you interact directly in educating families with children who are between 4 and 10 years old. Approximately 50 health professionals in Utah will participate in the study.

**Procedures** If you agree to be in this research study, the following will happen to you. You will be asked to talk to an interviewer for about 45 – 60 minutes. You will be given a stack of cards that have messages and pictures on them related to eating and activity. You will be asked to sort the stack of cards four times. Each time, you will be asked some questions about the messages on the cards. Then, you will be shown a silhouette of body shapes. We will ask you about these pictures. Finally, we will ask you some questions about yourself (e.g., your age, education, etc.). The interviews will be taped and later transcribed into a typed record.

**Risks** The risks of you participating in this research are minimal and we do not expect that being in the study will harm you in any way. There is a risk of others gaining access to personal information but this is unlikely because of the measures we use to protect your confidentiality.

**Benefits** There may or may not be any direct benefit to you from these procedures. What you share with us in the interview may help us make better messages about eating and activity for all families.

**Explanation & offer to answer questions** If you have other questions or concerns regarding this research, you may reach Professor Wong by phone (435-797-3464) or email (Siewsun.wong@cc.usu.edu).

**Payment** Each health professional will be paid \$15 for completing the study.

**Voluntary nature of participation and right to withdraw without consequence**


Participation in research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence.

**Confidentiality** Research records will be kept confidential, consistent with federal and state regulations. We will not use your name in the interview. After your interview is audio-taped and transcribed, the tape will be destroyed. Only the researcher and a trained interviewer will have access to the data, which will be kept in a locked file cabinet in a locked room for 3 years and then destroyed. This information will not have your name on it or any personal identifiable information. Only the researcher at USU will see your personal information. We will share the results of the study in group-form only.


**IRB Approval Statement** The Institutional Review Board for the protection of human participants at USU has approved this research study. If you have any pertinent questions or concerns about your rights or a research-related injury, you may contact the IRB Administrator at (435) 797-0567. If you have a concern or complaint about the research and you would like to contact someone other than the research team, you may contact the IRB Administrator to obtain information or to offer input.

**Copy of consent** You have been given two copies of this Informed Consent. Please sign both copies and retain one copy for your files.

**Investigator Statement** “I certify that the research study has been explained to the individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered.”

  
Heidi Wengreen, R.D., Ph.D.  
Principal Investigator  
(435) 797-1806

7/31/08  
Date

  
Siew Sun Wong, Ph.D.  
Co-Principal Investigator  
(435) 797-3464

7/31/08  
Date

**Signature of Participant** By signing below, I agree to participate.

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

## Appendix C. Informed Consent Form for Health professionals



Department of Nutrition and Food Sciences  
8700 Old Main Hill  
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Fax: (435) 797-2379

Date Created: June 18, 2006; Page 1 of 2  
USU IRB Original Approval 06/19/2007  
Approval terminates 06/18/2009  
Amend. #1 Approved 07/30/2008; Protocol Number 1836  
IRB Password Protected per IRB Administrator

**Informed Consent (Health Professional)**  
**Help in Overweight/Obesity Prevention Efforts (HOPE) Study**

**Introduction/ Purpose** Professors Heidi Wengreen and Siew Sun Wong in the Department of Nutrition and Food Sciences at Utah State University (USU) are conducting a research study to find out more about the practicality of weight prevention health messages. You have been invited to participate because you interact directly in educating families with children who are between 4 and 10 years old. Approximately 50 health professionals in Utah will participate in the study.

**Procedures** If you agree to be in this research study, the following will happen to you. You will be asked to talk to an interviewer for about 45 – 60 minutes. You will be given a stack of cards that have messages and pictures on them related to eating and activity. You will be asked to sort the stack of cards four times. Each time, you will be asked some questions about the messages on the cards. Then, you will be shown a silhouette of body shapes. We will ask you about these pictures. Finally, we will ask you some questions about yourself (e.g., your age, education, etc.). The interviews will be taped and later transcribed into a typed record.

**Risks** The risks of you participating in this research are minimal and we do not expect that being in the study will harm you in any way. There is a risk of others gaining access to personal information but this is unlikely because of the measures we use to protect your confidentiality.

**Benefits** There may or may not be any direct benefit to you from these procedures. What you share with us in the interview may help us make better messages about eating and activity for all families.

**Explanation & offer to answer questions** If you have other questions or concerns regarding this research, you may reach Professor Wong by phone (435-797-3464) or email (Siewsun.wong@cc.usu.edu).

**Payment** Each health professional will be paid \$15 for completing the study.

**Voluntary nature of participation and right to withdraw without consequence** Participation in research is entirely voluntary. You may refuse to participate or withdraw at any time without consequence.

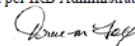
**Confidentiality** Research records will be kept confidential, consistent with federal and state regulations. We will not use your name in the interview. After your interview is audio-taped and transcribed, the tape will be destroyed. Only the researcher and a trained interviewer will have access to the data, which will be kept in a locked file cabinet in a locked room for 3 years and then destroyed. This information will not have your name on it or any personal identifiable information. Only the researcher at USU will see your personal information. We will share the results of the study in group-form only.

**IRB Approval Statement** The Institutional Review Board for the protection of human participants at USU has approved this research study. If you have any pertinent questions or concerns about your rights or a research-related injury, you may contact the IRB Administrator at (435) 797-0567. If you

# UtahState UNIVERSITY

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Logan, UT 84322-8700  
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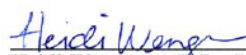


## Informed Consent (Health Professional) Help in Overweight/Obesity Prevention Efforts (HOPE) Study


have a concern or complaint about the research and you would like to contact someone other than the research team, you may contact the IRB Administrator to obtain information or to offer input.

**Copy of consent** You have been given two copies of this Informed Consent. Please sign both copies and retain one copy for your files.

**Investigator Statement** "I certify that the research study has been explained to the individual, by me or my research staff, and that the individual understands the nature and purpose, the possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered."

  
Heidi Wengreen, R.D., Ph.D.  
Principal Investigator  
(435) 797-1806

7/31/08  
Date

  
Siew Sun Wong, Ph.D.  
Co-Principal Investigator  
(435) 797-3464

7/31/08  
Date

**Signature of Participant** By signing below, I agree to participate.

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

## Appendix D. Health Professionals Recording Sheet

Health Profession ID: \_\_\_\_\_ (office use)

Interviewer's Initial: \_\_\_\_\_ Date: \_\_\_\_\_ County: \_\_\_\_\_ Event: \_\_\_\_\_

Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

**Demography**

Address: ZIP code:	Tel:
<b>Health Professional</b>	<b>Audience Currently Served</b>
First Name: _____ Last Name: _____	County:
Age:	City:
Body Size (refer to silhouette):	Race/Ethnicity of audience:
Height: _____ in                      Weight: _____ pounds	<input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian or Asian American <input type="checkbox"/> Black or African American <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> White or Caucasian <input type="checkbox"/> Other:
Race/Ethnicity: <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian or Asian American <input type="checkbox"/> Black or African American <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> White or Caucasian <input type="checkbox"/> Other	Type of audience: <input type="checkbox"/> Infant <input type="checkbox"/> Children <input type="checkbox"/> Adolescent <input type="checkbox"/> Young Adult <input type="checkbox"/> Adult <input type="checkbox"/> Elderly Members <input type="checkbox"/> Other:
Education Level: <input type="checkbox"/> Some college or technical school <input type="checkbox"/> BS/BA <input type="checkbox"/> RD <input type="checkbox"/> MD <input type="checkbox"/> Master degree <input type="checkbox"/> Doctorate degree <input type="checkbox"/> Other:	What action have you taken to help your audience prevent obesity?
Occupation:	
Money spent on food last month: \$ _____ per family	

HP ID: \_\_\_\_\_

**Meaning of Underlined Words/Phrases**

Message	Meaning
1. Decrease intake of <u>sweetened</u> beverages	
2. <u>Watch</u> portion sizes	
3. <u>Eat out less often</u>	
4. Make <u>wise</u> snacking choices	
5. <u>Eat breakfast everyday</u>	
6. Eat less <u>foods with empty calories</u>	
7. <u>Eat more fruits, vegetables and whole grain foods</u>	
8. <u>Allow children to eat all foods brought into the home</u>	
9. <u>Choose healthful foods when eating out</u>	
10. <u>Tell children to eat all of the meal before getting dessert</u>	
11. <u>Eat together as a family</u>	
12. Spend less time with computers and <u>video games</u>	
13. Watch less TV and <u>videos</u>	



HP ID: \_\_\_\_\_

**Card Sort 1**  
**Familiar vs. Not Familiar**

**Interviewer instructions:** Check the appropriate box as the HP sorts cards for each sort number.

Message	F	N F	Comments
1. Decrease intake of sweetened beverages			
2. Watch portion sizes			
3. Eat out less often			
4. Make wise snacking choices			
5. Eat breakfast everyday			
6. Eat less foods with empty calories			
7. Eat more fruits, vegetables and whole grain foods			
8. Allow children to eat all foods brought into the home			
9. Choose healthful foods when eating out			
10. Tell children to eat all of the meal before getting dessert			
11. Eat together as a family			
12. Spend less time with computers and video games			
13. Watch less TV and videos			

FAMILY ID: \_\_\_\_\_

**Card Sort 2 (Part 1)**  
**Always / Sometimes / Never Teach**

Message	Always		Sometimes		Never	
	Why	How	Why	How	Why	How
1. Decrease intake of sweetened beverages						
2. Watch portion sizes						
3. Eat out less often						
4. Make wise snacking choices						
5. Eat breakfast everyday						
6. Eat less foods with empty calories						
7. Eat more fruits, vegetables and whole grain foods						
8. Allow children to eat all foods brought into the home						
9. Choose healthful foods when eating out						
10. Tell children to eat all of the meal before getting dessert						
11. Eat together as a family						
12. Spend less time with computers and video games						
13. Watch less TV and videos						

HP ID: \_\_\_\_\_

**Card Sort 3**  
**Easy vs. Hard For Audience To Practice**

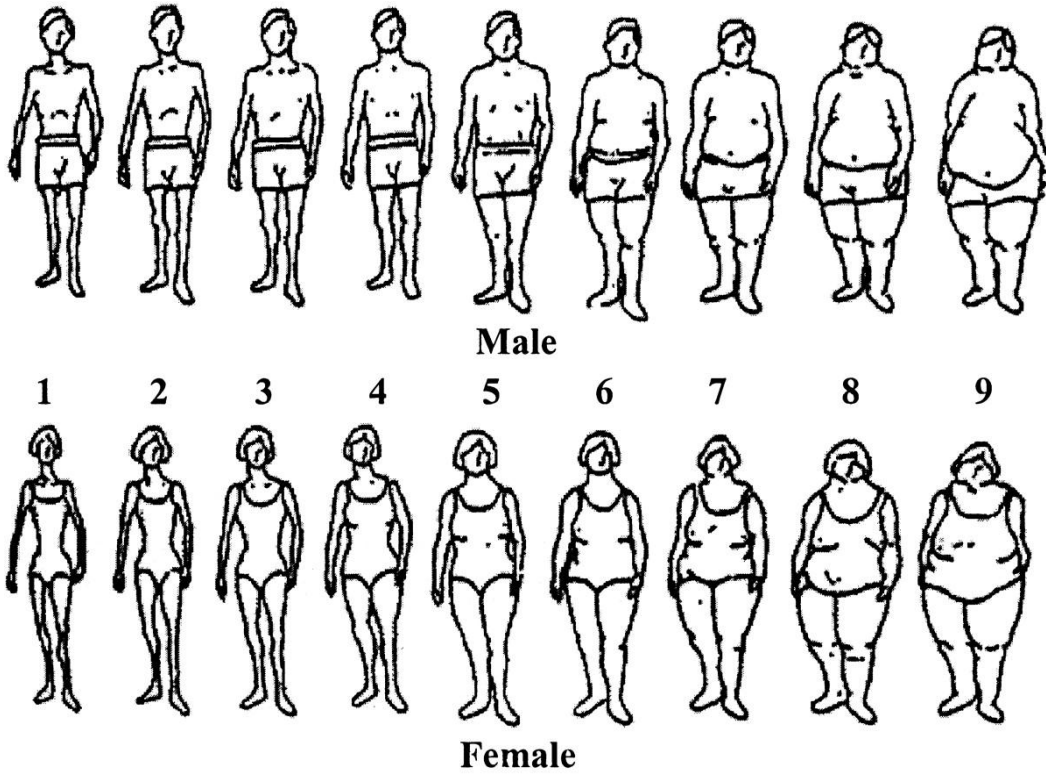
Behavior	Easy	Hard	Comments
1. Decrease intake of sweetened beverages			
2. Watch portion sizes			
3. Eat out less often			
4. Make wise snacking choices			
5. Eat breakfast everyday			
6. Eat less foods with empty calories			
7. Eat more fruits, vegetables and whole grain foods			
8. Allow children to eat all foods brought into the home			
9. Choose healthful foods when eating out			
10. Tell children to eat all of the meal before getting dessert			
11. Eat together as a family			
12. Spend less time with computers and video games			
13. Watch less TV and videos			

HP ID: \_\_\_\_\_

**Card Sort 4**  
**Yes vs. No**

Behavior	Yes	No	Comments
1. Decrease intake of sweetened beverages			
2. Watch portion sizes			
3. Eat out less often			
4. Make wise snacking choices			
5. Eat breakfast everyday			
6. Eat less foods with empty calories			
7. Eat more fruits, vegetables and whole grain foods			
8. Allow children to eat all foods brought into the home			
9. Choose healthful foods when eating out			
10. Tell children to eat all of the meal before getting dessert			
11. Eat together as a family			
12. Spend less time with computers and video games			
13. Watch less TV and videos			

Appendix E. Adult Figure Rating Scale



## Appendix F. Letter To The Parent



Department of Nutrition and Food Sciences  
8700 Old Main Hill  
Logan, UT 84322-8700  
Telephone: (435) 797-2126  
Fax: (435) 797-2379

Dear Parent,

Hello, my name is Rebecka Bagwell. I am a research assistant for Dr. Siew Sun Wong at Utah State University. The Department of Nutrition and Food Sciences and Cooperative Extension are participating in a Western Region Multistate Study (W-1005) to identify psychosocial factors associating with resiliency to childhood obesity among families.

Our research project in Utah is titled Help in Obesity Prevention Efforts (HOPE) Study. We are meeting with parents and children between the ages of 4-10, to gather your opinion on research-based health message that target childhood obesity prevention. You are invited to participate in this study, if you choose to. This one-time, face-to-face interview will last about 30 minutes. I will be happy to meet you at your home or at a location most convenient for you and your family. I will also be able to meet with you at a time that will work best for you and your family. At the end of the interview, you will receive \$15 as a token of appreciation.

If you decide to participate in this project, please contact me and I will be happy to follow-up with you to schedule a meeting time and a location.

Thank you. I look forward to hearing from you soon!

Sincerely,

Rebecka Bagwell  
Tel: (801) 726-8786  
Fax: (435) 797-2379  
[rebeckabagwell@gmail.com](mailto:rebeckabagwell@gmail.com)

\* Provided is a flier to give you further information, as well as an easy way to contact me.

## Appendix G. 2009 Human and Health Services Poverty Guidelines

<b>Persons in Family or Household</b>	<b>48 Contiguous States and D.C.</b>	<b>Alaska</b>	<b>Hawaii</b>
1	\$10,210	\$12,770	\$11,750
2	13,690	17,120	15,750
3	17,170	21,470	19,750
4	20,650	25,820	23,750
5	24,130	30,170	27,750
6	27,610	34,520	31,750
7	31,090	38,870	35,750
8	34,570	43,220	39,750
For each additional person, add	3,480	4,350	4,000

**SOURCE:** *Federal Register*, Vol. 72, No. 15, January 24, 2009, pp. 3147–3148

## Appendix H. Family Recording Sheet

**FAMILY RECORDING SHEET**

FAMILY ID: \_\_\_\_\_

**Demography**
 Interviewer's Initial: \_\_\_\_\_ Date: \_\_\_\_\_ County: \_\_\_\_\_ Event: \_\_\_\_\_  
 Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

Address: ZIP code:	Tel:				
<b>MOTHER</b>	<b>CHILD</b>				
First Name: Last Name:	First Name: Last Name:				
Age:	Age:			Sex: M F	
Body Size (refer to silhouette):	Body Size (refer to silhouette):				
Height: _____ in _____ pounds	Weight:		Height: _____ in Weight: _____ pounds		
Race/Ethnicity: <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian or Asian American <input type="checkbox"/> Black or African American <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> White or Caucasian <input type="checkbox"/> Other	<b>OTHER CHILDREN (4-10 YEARS OLD)</b>				
	Age	M F	Height	Weight	Body Size
		M F			
		M F			
		M F			
		M F			
		M F			
Education Level: <input type="checkbox"/> Have not completed high school <input type="checkbox"/> Received high school diploma or GED <input type="checkbox"/> Some college or technical school <input type="checkbox"/> 4-year degree or more	Family Size: Total = _____ Persons ( _____ Adults _____ Children)				
Employment Status <input type="checkbox"/> Homemaker <input type="checkbox"/> Not employed <input type="checkbox"/> Employed part time <input type="checkbox"/> Employed full time	Who cooks at home most of the time? _____				
Money spent on food last month: \$ _____ per family					



FAMILY ID: \_\_\_\_\_

**Meaning of Underlined Words/Phrases**

Message	Meaning
1. Decrease intake of <u>sweetened</u> beverages	
2. <u>Watch</u> portion sizes	
3. <u>Eat out less often</u>	
4. Make <u>wise</u> snacking choices	
5. <u>Eat breakfast everyday</u>	
6. Eat less <u>foods with empty calories</u>	
7. <u>Eat more fruits, vegetables and whole grain foods</u>	
8. <u>Allow children to eat all foods brought into the home</u>	
9. <u>Choose healthful foods when eating out</u>	
10. <u>Tell children to eat all of the meal before getting dessert</u>	
11. <u>Eat together as a family</u>	
12. Spend less time with computers and <u>video games</u>	
13. Watch less TV and <u>videos</u>	

FAMILY ID: \_\_\_\_\_

**Card Sort 1****Familiar vs. Not Familiar**

**Interviewer instructions:** Check the appropriate box as the participant sorts cards for each sort number.

Message	F	N F	Comments
1. Decrease intake of sweetened beverages			
2. Watch portion sizes			
3. Eat out less often			
4. Make wise snacking choices			
5. Eat breakfast everyday			
6. Eat less foods with empty calories			
7. Eat more fruits, vegetables and whole grain foods			
8. Allow children to eat all foods brought into the home			
9. Choose healthful foods when eating out			
10. Tell children to eat all of the meal before getting dessert			
11. Eat together as a family			
12. Spend less time with computers and video games			
13. Watch less TV and videos			

FAMILY ID: \_\_\_\_\_

**Card Sort 2 (Part 1)**  
**Always / Sometimes / Never**

Message	Always		Sometimes		Never	
	Why	How	Why	How	Why	How
1. Decrease intake of sweetened beverages						
2. Watch portion sizes						
3. Eat out less often						
4. Make wise snacking choices						
5. Eat breakfast everyday						
6. Eat less foods with empty calories						
7. Eat more fruits, vegetables and whole grain foods						
8. Allow children to eat all foods brought into the home						
9. Choose healthful foods when eating out						
10. Tell children to eat all of the meal before getting dessert						
11. Eat together as a family						
12. Spend less time with computers and video games						
13. Watch less TV and videos						

FAMILY ID: \_\_\_\_\_

**Card Sort 3**  
**Easy vs. Hard**

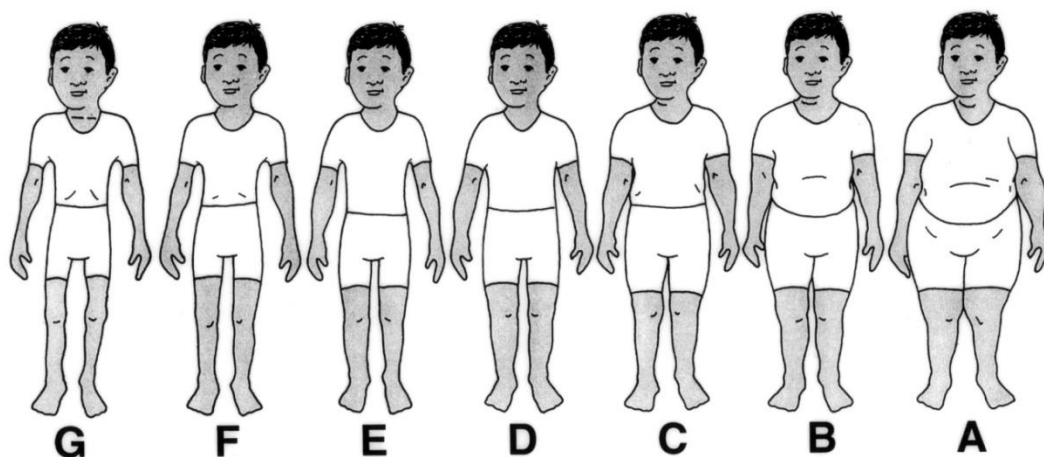
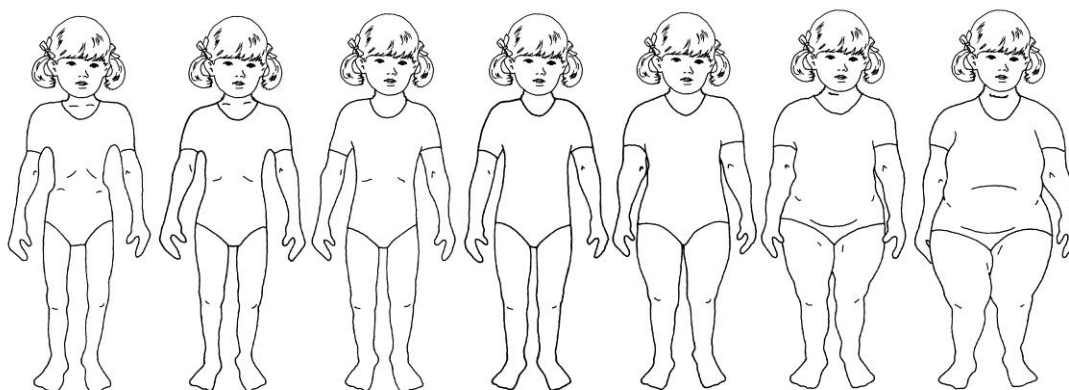
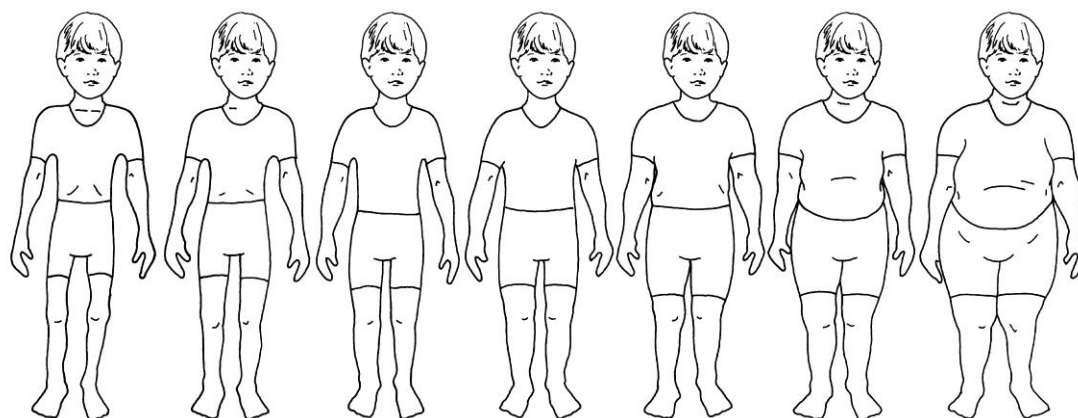
Behavior	Easy	Hard	Comments
1. Decrease intake of sweetened beverages			
2. Watch portion sizes			
3. Eat out less often			
4. Make wise snacking choices			
5. Eat breakfast everyday			
6. Eat less foods with empty calories			
7. Eat more fruits, vegetables and whole grain foods			
8. Allow children to eat all foods brought into the home			
9. Choose healthful foods when eating out			
10. Tell children to eat all of the meal before getting dessert			
11. Eat together as a family			
12. Spend less time with computers and video games			
13. Watch less TV and videos			

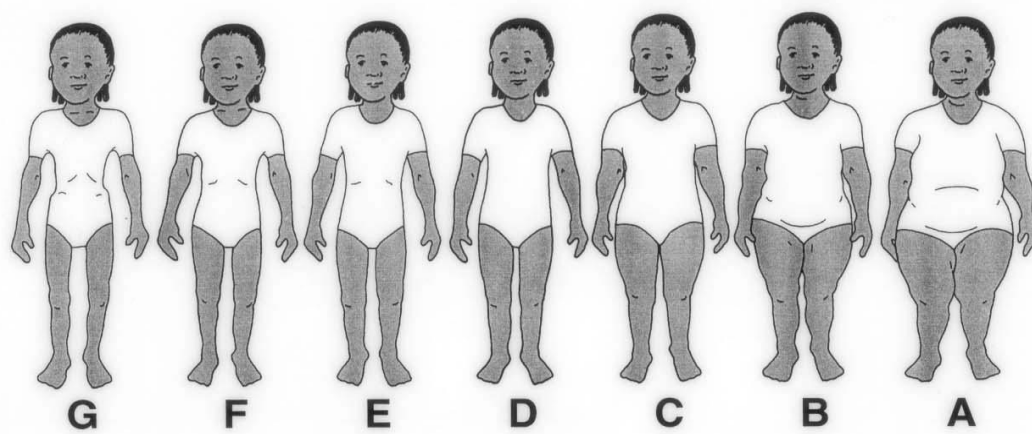
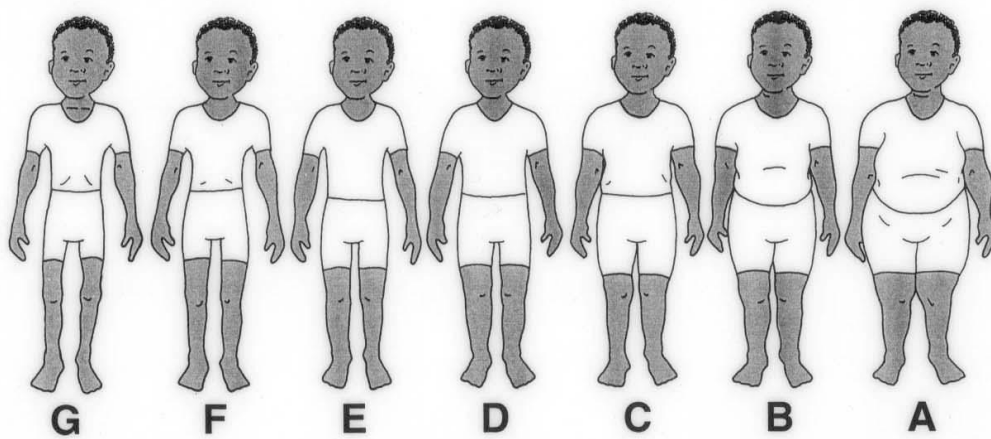
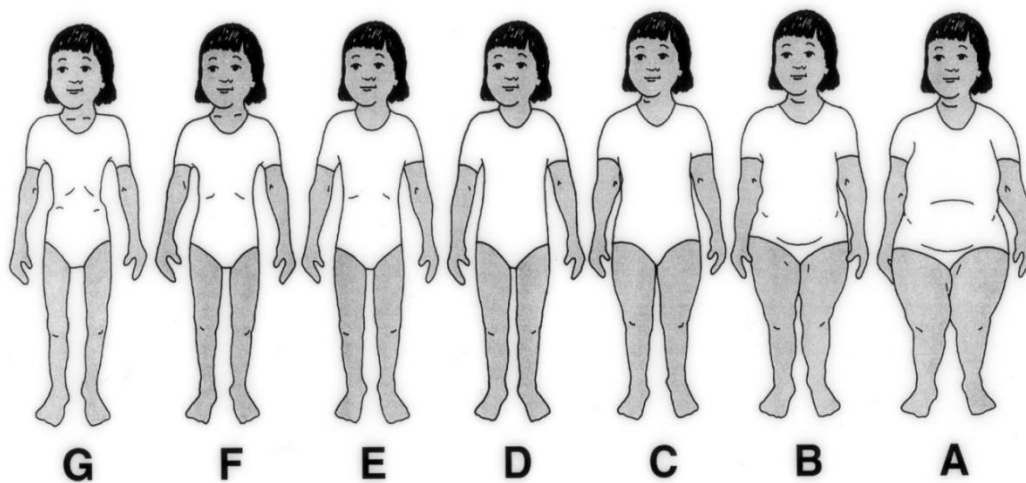
FAMILY ID: \_\_\_\_\_

**Card Sort 4****Yes vs. No**

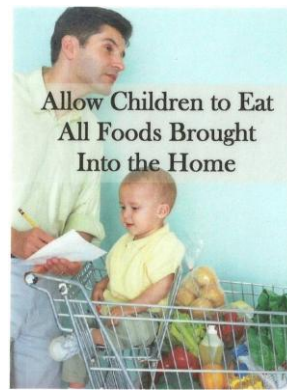
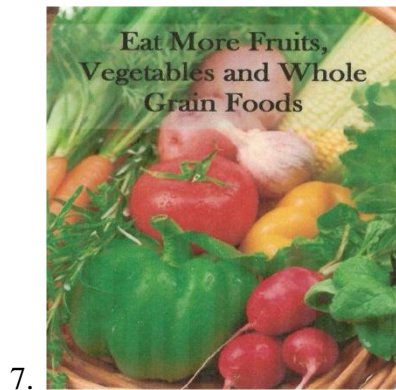
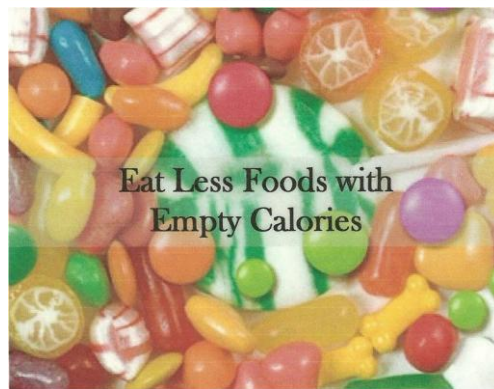
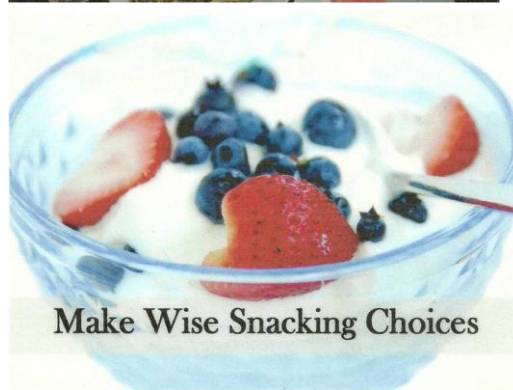
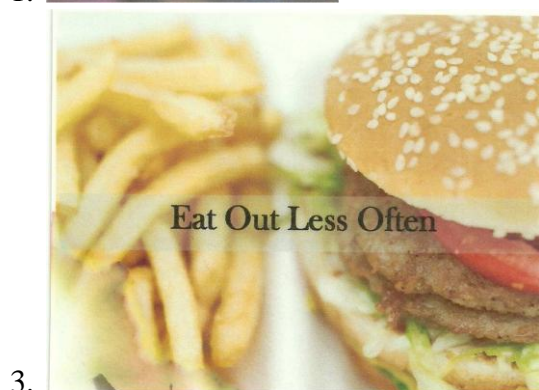
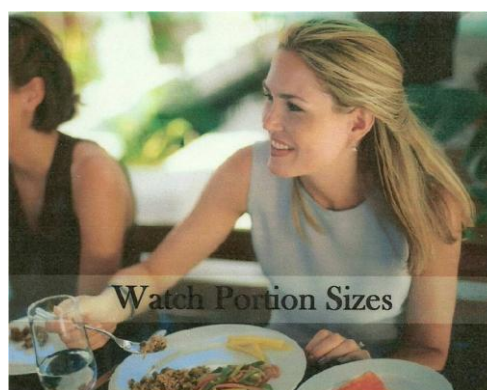
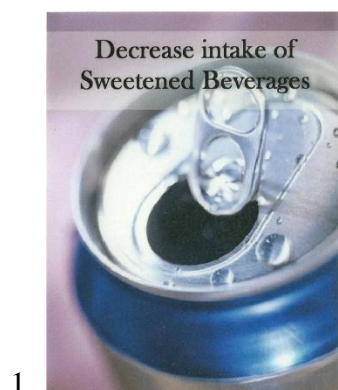
<b>Behavior</b>	<b>Yes</b>	<b>No</b>	<b>Comments</b>
1. Decrease intake of sweetened beverages			
2. Watch portion sizes			
3. Eat out less often			
4. Make wise snacking choices			
5. Eat breakfast everyday			
6. Eat less foods with empty calories			
7. Eat more fruits, vegetables and whole grain foods			
8. Allow children to eat all foods brought into the home			
9. Choose healthful foods when eating out			
10. Tell children to eat all of the meal before getting dessert			
11. Eat together as a family			
12. Spend less time with computers and video games			
13. Watch less TV and videos			

## Appendix I. Child Figure Rating Scale

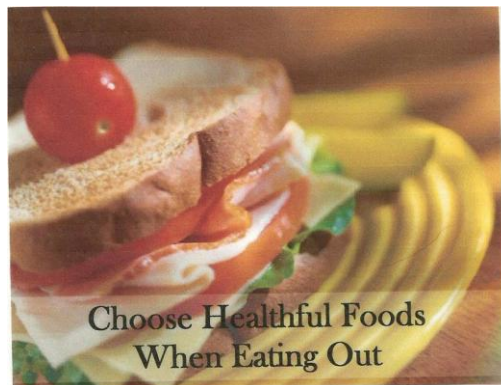




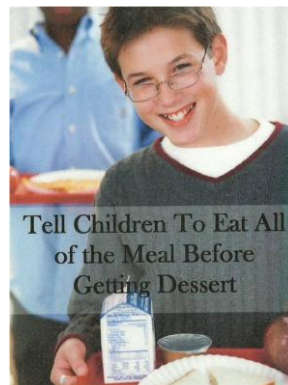
Appendix J. Pic-Sort Card Messages 1-13



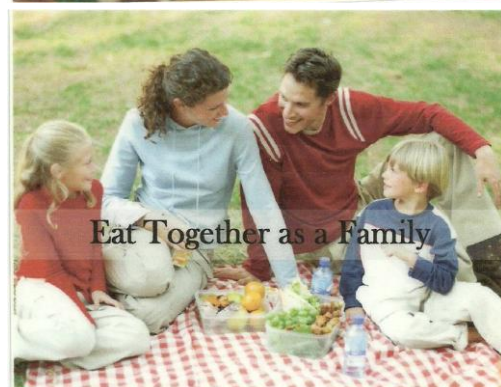




9.



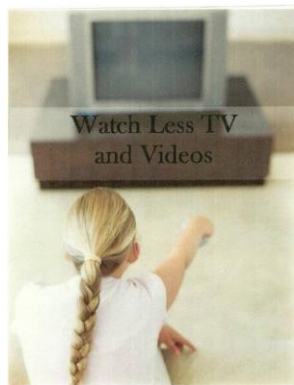
10.



11.



12.



13.

## Appendix K. Children Version Health Messages

#	Original	Choice 1	Choice2	Choice 3
1	Decrease intake of sweetened beverages	Drink less sweet drinks	Limit sugary drinks	Less sugary drinks
2	Watch portion sizes	Eat smaller servings	Choose smaller servings	Watch serving sizes
3	Eat out less often	Limit eating out <sup>b</sup>	Eat out less <sup>b</sup>	Eat less fast foods
4	Make wise snacking choices	Munch on healthy snacks	Choose healthy snacks	Select healthy snacks
5	Eat breakfast everyday	Always eat breakfast	Eat breakfast	Don't forget breakfast
6	Eat more fruit, vegetables and whole grains	Eat your fruits and veggies	Munch on fruits and veggies	Pick more fruits, vegetables and whole grains
7	Eat less foods with empty calories	Eat less candy, cakes, chips etc.	Eat less unhealthy foods	Limit eating unhealthy foods
8	Allow children to eat all foods brought into the home	Let children eat all foods brought into home	Let kids eat all foods in the house	Buy only foods you want your kids to eat
9	Choose healthful foods when eating out	Be healthy when eating out	Choose healthy foods at restaurants	Pick healthy alternatives at restaurants
10	Eat together as a family	Have family meals	Eat as a family	Eat family meals
11	Tell children to eat all of the meal before getting dessert	Tell children to eat dessert last	Save dessert for after the meal is eaten	Offer dessert when all of the meal is eaten
12	Spend less time with computers and video games	Limit time with computers and video games	Play less computer and video games	Reduce time with computers and video games
13	Watch less TV and videos	Limit time in front of the TV	Limit TV and video watching	Reduce TV and video watching

<sup>a</sup>, Finalized version is highlighted in grey.

<sup>b</sup>, These two options received equal votes. For simplicity, “Eat out less” was used.

## Appendix L. Health Professional Script

	<b>Instructions</b>	<b>Script</b>
1.	<p><b>Read and give the information sheet to the health professional.</b></p> <p><b>Read the consent form to the subject.</b></p>	<p>Before we begin, let's go through the consent form.</p>
2.	<p><b>Silhouettes</b></p> <p><b>Record answers on demographic sheet.</b></p>	<p>Now I would like to show you some pictures. This first page has women/men of different sizes. Which one best corresponds to your body?</p>
3.	<p><b>Demographics</b></p> <p><b>Record answers on demographic sheet</b></p>	<p>The next thing we will do is complete this sheet that describes you. I will record your answers on this sheet.</p>
4.	<p><b>Turn on tape-recorder</b></p> <p><b>Never mention subject's name during the interview</b></p>	<p>I am going to turn on the recorder now. Thank you for agreeing to help us.</p>
5.	<p><b>Record answers on sheet #5</b></p> <p><b>Referring to the underlined words on the sheet.</b></p>	<p>Okay, Here are thirteen cards. Each card has a health suggestion that doctors and nutritionists give to parents about feeding children. Let's go through the meaning of each suggestion.</p> <p>What do you think about the meaning of this word?</p> <p>Do you have any questions?</p>

	<b>Card Sort</b>	
6.	<b>Take out the message cards and place in front of subject. Read each card aloud.</b>	Okay – We will have four rounds of card sorting. In the first round we will look through these cards on which there are suggestions. Every one may not have heard of all of these suggestions. We also know that some of these may not be right for every person.
7.	<b>Place a checkmark in the appropriate column on sheet #1</b>  <b>Place the stack of unfamiliar suggestions to the side. Tie together with a rubber band.</b>	First, please sort through the cards and divide them into 2 piles: those that you have heard about and those which you haven't heard about.
	<b>Card Sort</b>	
8.	<b>Take out the topic cards. Read each card aloud.</b> <b>Place a (+) or (-) sign under the <i>familiar</i> column on sheet #1 to indicate if what they say is correct.</b>	Okay – tell me what you have heard about this topic.
9.	<b>Now change to the message stack of cards and follow instructions for Sort #1a above.</b>	
10.	<b>Record answers on sheet #2. Place a checkmark in the appropriate column.</b>	Now in the second round of sorting. For each suggestion you have heard about, divide the cards again. This time make 3 piles: ones you always or usually follow; ones you sometimes follow; and ones you seldom or never follow. Great – remember no one is

		going to judge you no matter what you do or don't do.
<b>11.</b>	<b>Place the stack of suggestions that are rarely followed to the side. Tie with rubber band.</b>  <b>Record significant words on sheet #2</b>	Let's look at the suggestions you <i>always</i> or usually follow. Can you explain what made you decide to do this? Why is it important to do?  <i>PROBES:</i> Is it easy for you to do? Does everyone in your family follow this? If not, what do you do?
<b>12.</b>	<b>Record significant words on sheet #2</b>	For the ones you <i>sometimes</i> do, why and how do you do these? Can you tell me when you follow these? (special occasions, weekends etc.) <i>PROBES:</i> (see above)
<b>13.</b>	<b>Go back to the <i>rarely</i> followed stack. Record significant words on sheet #2</b>	Okay – this pile contains suggestions you seldom or never follow. What makes it difficult to follow?
<b>14.</b>	<b>Go back to the unfamiliar stack of cards</b>  <b>Record significant words on sheet #2</b>	What about these suggestions you have never heard about. Do you think they would work?  <i>PROBES:</i> How would they work for your family? What can you do to follow this suggestion? If you make this change do you think your child will follow your good example?

15.	<p style="text-align: right;"><b>Sort #3</b></p> <p><b>Put all cards together in the order listed on the recording sheet. Record answers on sheet #3</b></p>	<p>Terrific. We are done with the second round. Two more rounds to go. Let's put all the cards back together. Round three is very easy. As you go through each card, think about other families. These suggestions hard or easy for them to do.</p>
16.	<p><b>Let participant choose which pile to discuss first.</b> <b>Record significant words on sheet #3</b></p>	<p>Why do you think it is easy/hard for other families to (read message)?</p>
17.	<p><b>Record answers on sheet #4</b> <b>Record significant words on sheet #4</b></p>	<p>Great, we are done with the third round. In this final round, think about suggestions that may help your child keep a healthy weight. If you think the suggestions will help put the card under YES. If you think it will not help, put the card under NO. If you are not sure put the card under NOT SURE. Do you have any questions?</p>
18		<p>Okay – we are finished with the card sort.</p>
19.	<p><b>End of Interview</b> <b>Turn off recorder.</b></p>	<p>Ask the mother if there is anything else they wish to tell you. Thank you for your time. For our appreciation here is a little gift for you and your child. Could you please sign here to confirm that you have received this gift. (ask for any referrals to another family)</p>

## Appendix M. Parent Script

## PARENT SCRIPT – Round 1

	INSTRUCTIONS	SCRIPT	✓
1.	<p><b>Give 1 consent form to mom and 1 to yourself. Read and explain the consent form to participant.</b></p>	<p>Before we begin, let's go through the consent form.</p> <p><i>(Becky &amp; Stacy, please take turn to do this to save your voice. You can summarize long paragraphs for them)</i></p>	
2.	<p><b>SILHOUETTES</b></p> <p><b>Record answers on Demography Sheet.</b></p> <p><b>Bring parent and kid to height &amp; weight station.</b></p>	<p>Now I would like to show you some pictures. This first page has women of different sizes. Which one best corresponds to your body size?</p> <p>Okay, now look at the page related to your child. Which one best corresponds to your child's body size?</p>	
3.	<p><b>DEMOGRAPHICS</b></p> <p><b>Separate parent and kid.</b></p> <p><b>Record answers on Demography Sheet for parent only.</b></p>	<p>The next thing we will do is complete this sheet that describes you and your family. I will record your answers on this sheet.</p>	
4.	<p><b>Turn on tape-recorder</b></p> <p><b>Never mention subject's name during the interview</b></p>	<p>I am going to turn on the recorder now. Thank you for agreeing to help us.</p>	
5.	<p><b>Record answers on Demography Sheet</b></p> <p><b>Referring to the underlined words on the sheet.</b></p>	<p>Okay, here are 13 cards. Each card has a health suggestion that doctors and nutritionists give to parents about feeding children. Let's go through the meaning of each suggestion.</p> <p>What do you think about the meaning of this word?</p> <p>Do you have any questions?</p>	

6.	<p><b>PIC-SORT</b></p> <p>Take out the message cards and place in front of subject. Read each card aloud.</p>	<p>We will have four rounds of card sorting. In the first round, we will look at each card and talk about the suggestion. Not everyone has heard about all these suggestions.</p>	
7.	<p>Place a checkmark in the appropriate column on <b>Sheet #1</b></p> <p>Place the stack of <b>Not Familiar</b> suggestions to the side. Tie together with a rubber band.</p> <p>Read each <b>Familiar</b> message aloud. Place a (+) or (-) sign under the <b>Familiar</b> column on <b>Sheet #1</b> to indicate if what they say is correct.</p>	<p>Now, please sort these cards into 2 piles: <b>Familiar</b> or <b>Not Familiar</b>.</p> <p>If you have heard about the suggestion, put it under “Familiar.” If you haven’t heard about it before, put them under “Not Familiar.</p> <p>Do you have any questions?</p> <p>Okay – tell me what you have heard about this topic.</p> <p>Good! We are done with Round 1!</p>	

**PARENT SCRIPT – Round 2**

	INSTRUCTIONS	SCRIPT	✓
10.	<p><b>PIC-SORT: FAMILIAR</b></p> <p>Record answers on <b>Sheet #2</b>.</p> <p>Place a checkmark in the appropriate column.</p>	<p>In the second round of sorting, I would like you to take this “Familiar” pile. Divide them into 3 piles:</p> <ol style="list-style-type: none"> <li>1. Suggestion you <b>always or usually follow</b></li> <li>2. Suggestion you <b>sometimes follow</b>, and</li> <li>3. Suggestion you <b>seldom or never follow</b>.</li> </ol> <p>Great – remember no one is going to judge you no matter what you do or don’t do.</p>	



11.	<p>Place the stack of suggestions that are <b>Rarely Followed</b> to the side. Tie with rubber band.</p> <p><b>PIC-SORT: ALWAYS FOLLOW</b></p> <p>Record significant words on <b>Sheet #2</b></p>	<p>Let's look at the suggestions you <b>always or usually follow</b>. Can you explain what made you decide to do this? Why is it important to do?</p> <p><b>PROBES</b></p> <ol style="list-style-type: none"> <li>1. Is it easy for you to do?</li> <li>2. Does everyone in your family follow this?</li> <li>3. If not, what do you do?</li> </ol>	
12.	<p><b>PIC-SORT: SOMETIMES FOLLOW</b></p> <p>Record significant words on <b>Sheet #2</b></p>	<p>For the ones you <b>sometimes</b> do, why and how do you do these?</p> <p>Can you tell me when you follow these? (special occasions, weekends etc.)</p> <p><b>PROBES</b> (see above)</p>	
13.	<p><b>PIC-SORT: SELDOM FOLLOW</b></p> <p>Go back to the <b>Rarely Followed</b> stack. Record significant words on <b>Sheet #2</b></p>	<p>Okay – this pile contains suggestions you <b>seldom or never follow</b>. What makes it difficult to follow?</p>	
14.	<p><b>PIC-SORT: NOT FAMILIAR</b></p> <p>Go back to the <b>Unfamiliar</b> stack of cards</p> <p>Record significant words on <b>Sheet #2</b></p>	<p>What about these suggestions you have never heard about. Do you think they would work?</p> <p><b>PROBES</b></p> <ol style="list-style-type: none"> <li>1. How would they work for your family?</li> <li>2. What can you do to follow this suggestion?</li> <li>3. If you make this change do you think your child will follow your good example?</li> </ol>	

	INSTRUCTIONS	SCRIPT	✓
15.	<p><b>Put all cards together in the order listed on the recording sheet.</b></p> <p><b>Record answers on Sheet #3</b></p>	<p>Terrific! We are done with the second round. Two more rounds to go.</p> <p>Let's put all the cards back together. Round 3 is very easy.</p> <p>As you go through each card, think about other families.</p> <p>Are these suggestions hard or easy for them to do?</p>	
16.	<p><b>Let participant choose which pile to discuss first.</b></p> <p><b>Record significant words on Sheet #3</b></p>	<p>Why do you think it is easy (or hard) for other families to _____ (read message)?</p>	

**PARENT – Round 4**

	INSTRUCTIONS	SCRIPT	✓
17.	<p><b>Sheet #4</b></p> <p><b>Record significant words on sheet #4</b></p>	<p>Great, we are done with the third round.</p> <p>In this final round, think about suggestions that may help your child keep a healthy weight.</p> <p>If you think the suggestions will help, put the card under <b>YES</b>.</p> <p>If you think it will not help, put the card under <b>NO</b>.</p> <p>If you are not sure put the card under <b>NOT SURE</b>.</p> <p>Do you have any questions?</p>	
18.		<p>We are done with the card sort!</p>	

**END OF INTERVIEW**

	INSTRUCTIONS	SCRIPT	✓

<b>19.</b>	<b>Turn off recorder</b>  <b>Ask for any referrals to another family</b>	Ask the mother if there is anything else they wish to tell you.  Thank you for your time. For our appreciation here is a little gift for you and your child. Could you please sign here to confirm that you have received this gift?
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## Appendix N. Child's Recording Sheet/ Script

**CHILDREN'S FFQ PIC-SORT**

Interviewer's Initial: \_\_\_\_\_ Date: \_\_\_\_\_ County: \_\_\_\_\_

Event: \_\_\_\_\_

Child's Name: \_\_\_\_\_

Mom's Name: \_\_\_\_\_ Family ID: \_\_\_\_\_ (office  
use)

Child's Age: \_\_\_\_\_ Sex: M F

**Sorting Instruction**

1. Give the child one stack at a time. Begin with the BEVERAGES, then OUT TO EAT FOODS, then EMPTY CALORIES FOODS.
2. After the child sorts cards into YES or NO, pick up the YES pile. Ask about yesterday's intake frequency.
3. Pick up the NO pile. Record intake frequency.
4. At the end of the interview, thank the child. Tell the child that the gift is with mom. Ask the child to tell other friends to join this fun study!

**INTRODUCTION**

**Interviewer:** Here are 3 stacks of food picture cards. I would like you to tell me how often you eat or drink these foods. Now, think about all the foods you ate and drank yesterday, from the time you got up in the morning, until the time that you went bed last night.

Remember, yesterday was \_\_\_\_\_ (day of the week). Remembering what you did yesterday will also help you remember what food you had yesterday.

Round 1 Now, go through these cards stack by stack, if you ate the food yesterday, put it in the "YES" box. If you didn't eat the food, put it in the "NO" box.

## Round 2

Good job! Now we will go through the “YES” Pile. Please tell me how many times you ate or drank these foods.

ROUND 1	YES	NO	ROUND 2	How many times did you eat/drink this food yesterday?
1. Juice in a glass				
2. Drinks in a box				
3. Drinks in a pouch				
4. Soda pop				
5. Popsicles				
6. Otter pops				
7. Punch or lemonade				
8. Slurpee or Iced				
9. French fries				
10. Hamburgers				
11. Chicken nuggets				
12. Tacos				
13. Pizza				
14. Candy				
15. Candy bar				
16. Cookies				
17. Cake				
18. Pie				
19. Ice cream				
20. Popcorn				
21. Granola bars				
22. Potato chips				
23. Crackers				
24. Fruit snacks				
25. Donuts				
26. Poptarts				
27. Cold cereal				
What kind of cereal did you eat yesterday?				

**ROUND 3**

Good job! This is our final round. Would you please pick up the “NO” pile?

Even though you didn’t eat these foods yesterday. Think about how often you eat them. Now, let’s go through this pile, and I would like you to give me one best answer from these 4 choices:

1. Almost everyday
2. A lot, every week but not everyday
3. Once in a while, a couple of times a month
4. Almost never

Do you have any questions? Let’s start!”

<b>ROUND 3</b> (Mark ✓)	<b>1</b> <b>Almost every</b> <b>day</b>	<b>2</b> <b>A lot, every</b> <b>week but not</b> <b>everyday</b>	<b>3</b> <b>Once in a</b> <b>while, a</b> <b>couple of</b> <b>times a</b> <b>month</b>	<b>4</b> <b>Almost never</b>
1. Juice in a glass				
2. Drinks in a box				
3. Drinks in a pouch				
4. Soda pop				
5. Popsicles				
6. Otter pops				
7. Punch or lemonade				
8. Slurpee or Icee				
9. French fries				
10. Hamburgers				
11. Chicken nuggets				
12. Tacos				
13. Pizza				
14. Candy				

15. Candy bar				
16. Cookies				
17. Cake				
18. Pie				
19. Ice cream				
20. Popcorn				
21. Granola bars				
22. Potato chips				
23. Crackers				
24. Fruit snacks				
25. Donuts				
26. Poptarts				
27. Cold Cereals				