

DEVELOPMENT OF ACCEPTABLE EMOTION-
BASED NUTRITION MESSAGES FOR OKLAHOMA
MOTHERS OF ELEMENTARY SCHOOL-AGE
CHILDREN

By

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CHAPTER I

INTRODUCTION

Overweight and obesity in children is of national concern. In 2007-2008, the United States Centers for Disease Control and Prevention (CDC) determined that obesity in children (Body Mass Index [BMI]-for-age $\geq 95^{\text{th}}$ percentile) accounted for approximately 10.4%, 19.6%, and 18.1% of children from the ages of 2-5, 6-11, and 12-19 years. Childhood obesity is strongly associated with various health-related consequences such as risk for overweight and obesity in adulthood (Guo, Wu, Chumlea, & Roche, 2002; Freedman, et al., 2005), metabolic syndrome (Sun, et al., 2008), cardiovascular disease (Freedman, et al., 2005), type 2 diabetes, sleep apnea (Gupta, Mueller, Chan & Meininger, 2002), orthopedic problems (Yanovski, 2001), and psychosocial problems (Puhl & Brownell, 2001).

Many factors contribute to the increase in childhood obesity, including the taste preferences of children, or the preference of one food item over another (Birch, 1999). The development of taste preferences and the family's eating patterns has a strong impact on the nutritional quality of a child's diet (Birch, 1999; Birch & Fisher, 1998). Studies have reflected that infants have an innate preference for sweet and salty tastes and are

generally neophobic and reject new foods (Birch & Fisher, 1998). It has been shown that a child is much more accepting of a food if parents expose their child to a variety of foods, as early as pregnancy and lactation (Birch, 1999; Mennella, Jagnow, & Beauchamp, 2001), and provide healthful foods in the child's eating environment (Birch & Fisher, 1998). Additionally, children are more likely to consume healthful foods if parents or others role model consumption of these foods (Gibson, Wardle, & Watts, 1998).

Parents play a specific role in the development of a child's eating pattern, and this includes consumption of fruits and vegetables and dairy foods, in addition to the environment in which a family consumes their meals. Epidemiological evidence has shown that a diet abundant in fruits and vegetables is correlated with a decreased risk for chronic diseases such as heart disease, hypertension, diabetes mellitus, and some types of cancer (Bazzano, 2006; van Duyn & Pivonka, 2000). High intakes of fruits and vegetables have also been associated with weight management due to their high water and fiber content and low energy density (Rolls, Ello-Martin, & Tohill, 2004; Yao & Roberts, 2001). Low-fat dairy has also been found to be a contributor in weight management (Mirmiran, Esmailzadeh, & Azizi, 2005) in addition to other health related benefits such as reduced risk for hypertension, stroke, colon cancer, type 2 diabetes, and cardiovascular mortality (Gerritor, Punam, & Bente, 1998).

Despite the positive effects of fruits and vegetables and low-fat milk, intake remains low, especially in Oklahoma. Compared to other states, only 15.7% of Oklahoma youth report eating the recommended five daily servings of fruits and vegetables (Youth Risk Behavior Survey [YRBS], 2009). Adequate milk consumption is

also quite low with only a reported 10.8% of Oklahoma youth drinking three or more glasses of milk per day over the last 7 days (YRBS, 2009), which could be affected by the amount of sugar-sweetened beverages and soft drinks consumed (Fioritio, Marini, Mitchell, Smicklas-Wright, & Birch, 2010).

Another aspect of a child's diet is the environment in which it is consumed. Eating together can be a challenge for many families when demands from school, work, and extracurricular activities are taken into account (Neumark-Sztainer, Story, Ackard, Moe, & Perry, 2000). However, frequent family meals have also been associated with consumption of higher nutrient-dense foods and lower consumption of fats, fried foods, and sugar-sweetened beverages (Gillman, et al., 2000; Larson, Neumark-Sztainer, Hannan, & Story, 2007). Additionally, family meals have been linked to promotion of healthful food preferences later in life (Burgess, et al., 2009). Family connectedness and a decrease in high risk behaviors of youth such as substance use, sexual activity, depression, suicide, violence, school problems, and disordered eating is another benefit of frequent consumption of family meals (Neumark Sztainer, Story, Ackard, Moe, & Perry, 2000, Fulkerson et al., 2009).

The number of obese children has risen sharply over the past three decades and continues to follow that trend (National Health and Nutrition Examination Survey [NHANES], 2003), despite numerous nutrition interventions. This is especially evident for Oklahomans who continue to rank low in fruit, vegetable, and milk consumption and high in overweight and obesity rates (YRBS, 2009). It can be suggested that traditional nutrition messaging that targeted the aforementioned behaviors is not effective. Evidence has shown that while nutrition messages are successful in transferring knowledge, they

have not been translated into a behavior change (Horodynski, Hoerr, & Coleman, 2004). Traditionally, nutrition messages conveyed information with a great deal of facts and science; however, consumers may not relate to this type of message because it is not communicated in a way that is concurrent with their values and, therefore, is not worthy of their time and effort to practice.

Addressing the important values and emotionally based rewards of making a behavior change is one strategy that the United States Department of Agriculture (USDA, 2008) adopted from emotional marketing techniques to connect with consumers' emotions, rather than intellect. Barry Feig (1997) refers to this as emotional marketing in which consumers make a decision based on feelings rather than facts and focuses specifically on what is important to that individual consumer's situation. To better understand the application of this technique to nutrition messages, and the discrepancy between parental knowledge and behaviors focus groups were conducted with parents of school-age children (Hildebrand, McCarthy, & Crossley, 2010). Findings from these focus groups revealed that Oklahoma parents highly valued family relationships and their children's achievement and happiness. These values were consistent with several of the emotional hot buttons identified by Feig (2006), specifically family values, nurturing, and achievement. In addition, it was found that parents would rather spend time with their family and help their children be the best they can be than spend time and money procuring healthy food choices and physical activity ideas.

Hildebrand, et al. (2010) findings were also consistent with USDA's recent emotion-based research entitled *Maximizing the Message* (2008), in which emotionally targeted nutrition messages were designed for mothers of preschool and elementary

school age children. While these messages have been tested with a nationally representative population of mothers of school-age children, they have not been developed into fact sheets for use in nutrition education programming or tested with Oklahoma mothers of elementary school-age children. As such, there is a need to determine how emotion-based messages resonate with Oklahoma mothers and if their use in fact sheets are relevant, motivating, and within the caregivers ability to complete.

Significance of the Study

The purpose of this study was to compare three developed emotion-based fact sheets that were aimed specifically at values of Oklahoma parents (Hildebrand, et al., 2010) to three previously implemented intellect-based fact sheets for relevance, motivational value, and ability of the Oklahoma mother to complete the health behavior within the message. Our null hypotheses include:

1. There will be no difference in preference between emotion-based and intellect-based nutrition messages.
2. There will be no difference in scores of relevance between emotion-based and intellect-based nutrition messages.
3. There will be no difference in scores of motivation between emotion-based and intellect-based nutrition messages.
4. There will be no difference in scores of ability between emotion-based and intellect-based nutrition messages.

Answers to these hypotheses will provide nutrition educators with knowledge regarding characteristics of the emotion-based fact sheets that appealed to Oklahoma mothers of elementary school age children. The information can be used to develop future fact

sheets regarding other nutritional information specific to their community. These fact sheets and similar ones are appropriate for use in nutrition education programs across Oklahoma that target mothers of young children.

Study Objectives

1. Determine if participants prefer emotion-based messages over intellect-based messages
2. Determine if participants consider fact-sheet messaging relevant to their individual life situation
3. Determine whether nutrition messages are perceived as motivational for changing health behaviors
4. Determine if participants have the ability to complete the message being communicated in each fact sheet

Assumptions

1. Participants accurately and honestly reported their thoughts, feelings, and opinions regarding each of the three emotion-based and three intellect-based fact sheets.
2. Participants accurately scored their feelings regarding relevance, motivation, and ability of each of the three emotion-based and three intellect-based fact sheets.

Limitations

1. Our study had a limited number of participants ($n = 12$), possibly due to not providing a monetary incentive for participation in the study. In addition, our focus groups took place during the fall, which may be a busy time for most parents to participate in an outside activity.

2. Participants in this study were a homogenous group consisting primarily of Caucasian females from medium income households residing in the northwestern region of Oklahoma
3. Participants from Okarche did not participate in a focus group as many of them expressed time restraints and unwillingness to participate in an open and recorded focus group, but were willing and able to review the fact sheets and fill out the corresponding scorecards.

Terms and Abbreviations

Behavioral Risk Factor Surveillance System (BRFSS): A state-based system of health surveys that monitors priority health risk behaviors, preventive health practices, and health care access related to chronic disease of all fifty states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands (CDC, 2008)

Body Mass Index (BMI): A measurement used by the Centers for Disease Control and Prevention (CDC) as an index of a person's weight in relation to height. It is calculated by dividing weight in kilograms by the square of the person's height, in meters (CDC, 2011)

BMI-for-age: In children, BMI is age- and sex-specific and is often referred to as BMI-for-age. BMI is plotted on a CDC growth chart to determine percentile ranking, or the specific child's BMI among children of the same sex and age. A child's BMI status is determined as underweight (<5th percentile), healthy weight (5th - <85th percentile), overweight (85th - <95th percentile), or obese (\geq 95th percentile) (CDC, 2011).

Cardiovascular Disease: A term used by the American Heart Association (AHA) to generalize diseases of the heart and blood vessels related to atherosclerosis, in which plaque builds up in the walls of arteries. Diseases of the heart and blood vessels can include heart attack, ischemic stroke, heart failure, arrhythmia, and heart valve problems (American Heart Association [AHA],2010)

Emotion-based marketing: A term used by Barry Feig to address how consumers emotionally regard a product or the way an emotional connection is made with consumers (Feig, 1997)

Emotion-based nutrition messages: Nutrition messages focused primarily on highly regarded values and beliefs of the consumer to encourage a nutrition behavior.

High-density lipoprotein (HDL): A transport lipoprotein which primarily removes cholesterol from cells and returns it to the liver to be excreted in the bile. A higher level of HDL is known to be associated with a lower risk for CVD (Gropper, Smith, & Groff, 2009).

Intellect-based: Nutrition messages focused primarily on providing intellectual and factual information regarding the importance of nutrition behaviors.

Low-density lipoprotein (LDL): A primary cholesterol transport protein that deposits cholesterol throughout the body tissues to be used for processes in the body. A higher level of LDL is known to be associated with a higher risk for CVD (Gropper et al., 2009)

National Cholesterol Education Program's (NCEP) Adult Treatment Panel (ATP) III guidelines: A general outline for prevention of coronary heart disease by providing recommendations for cholesterol testing and management (National

Cholesterol Education Program, National Heart, Lung, and Blood Institute & National Institutes of Health, 2002)

Overweight, childhood: A term used by the Centers for Disease Control and Prevention (CDC) to describe children ages two to twenty years whose BMI-for-age lies between the 85th and 95th percentiles when plotted on a CDC growth chart and compared to other children of the same gender and age (CDC, 2011)

Obesity, childhood: A term used by the Centers for Disease Control and Prevention (CDC) to describe children ages two to twenty years whose BMI-for-age is greater than the 95th percentile when plotted on a CDC growth chart and compared to other children of the same gender and age (CDC, 2011)

Overweight, adult: A term used by the Centers for Disease Control and Prevention (CDC) to describe adults over the age of twenty years whose BMI lies between 25.0 and 29.9 (CDC, 2011)

Obesity, adult: A term used by the Centers for Disease Control and Prevention (CDC) to describe adults over the age of twenty years whose BMI is greater than 30.0 (CDC, 2011)

Triglycerides (TG): The form fat takes after ingestion to be transported in the blood and stored in fat cells (AHA, 2011)

Type I diabetes mellitus (T1DM): a condition in which the body does not produce adequate insulin to aid in glucose uptake into the body's cells. T1DM is also known as juvenile diabetes as it is usually diagnosed in children and young adults (American Diabetes Association [ADA], 2010)

Type II Diabetes Mellitus (T2DM): a condition in which the body either does not produce enough insulin or the body's cells do not respond to insulin to uptake glucose (ADA, 2010)

United States Department of Agriculture (USDA): A federal component of the United States government that oversees issues regarding agriculture, education and outreach, food and nutrition, laws and regulations, marketing and trade, natural resources and environment, research and science, rural and community development, and travel and recreation (USDA, 2011)

Youth Risk Behavior Surveillance System (YRBSS): A national school-based survey conducted by the CDC that monitors priority health-risk behaviors and the prevalence of obesity among youth (CDC, 2011)

CHAPTER II

REVIEW OF LITERATURE

Emotion-based marketing is frequently used in the business world to sell products. It is successful because it associates an attribute of the product to a high emotional value held by the consumer, thus motivating action (Feig, 1997). In the field of nutrition education, we also have a product to sell - healthful nutrition behaviors. By nature, nutrition messages convey information with a great deal of intellect and science. These messages are frequently perceived as burdensome or impractical because they conflict with highly valued goals (McCarthy, 2009). As a result, people often know recommended nutrition behaviors, but they are not motivated to transfer the knowledge into behaviors (Hildebrand, et al., 2010). Despite the numerous nutrition education interventions aimed to improve eating behaviors, lack of motivation to change contributes to the high prevalence of obesity among Oklahoma children (YRBS, 2009).

Trends and Health Complications Related to Childhood Obesity

Overweight and obesity in United States youth is of national concern. To determine overweight and obesity in children, body mass index (BMI) is calculated as it is for adults; however, the difference is that BMI in children is plotted on a Center for

Disease Control and Prevention (CDC) BMI-for-age growth chart (CDC, 2009). Based on the growth charts, a child is considered overweight if their BMI-for-age is between the 85th and 95th percentile. A child is considered obese if their BMI-for-age is greater than or equal to the 95th percentile. It was determined that the 2007-2008 rates of obesity in children (BMI-for-age \geq 95th percentile) from the ages of 2-5 years of age, 6-11 years of age, and 12-19 years age accounted for approximately 10.4%, 19.6%, and 18.1%, respectively (CDC, 2010). Childhood obesity is associated with various health-related consequences such as risk for overweight and obesity in adulthood (Guo, et al., 2002; Freedman, et al., 2005), metabolic syndrome (Sun, et al., 2008), cardiovascular disease (Freedman, et al., 2005), type 2 diabetes, sleep apnea (Gupta, et al., 2002), orthopedic problems (Yanovski, 2001), and psychosocial problems (Puhl & Brownell, 2001).

Increased Risk for Obesity in Adulthood

Some studies have shown a positive correlation with childhood obesity and prediction of adult obesity (Guo, et al., 1994; Freedman, et al., 2005). One frequently cited meta-analysis conducted by Guo, Roche, and Chumlea (2002) examined the effect of childhood BMI on overweight status later in life. In this study, data from four longitudinal studies were included and it was found that the likelihood of being overweight at age 35 increased with age in children who had a BMI in the 75th to 95th percentiles at any point of adolescent life. The researchers concluded that a higher childhood BMI, especially in the 95th percentile, was predictive of a higher BMI in adulthood. Freedman and colleagues (2005) also found a positive correlation between childhood obesity and adult obesity. Subjects in this study included 2,610 children from the Bogalusa Heart Study, who were followed from ages 18 to 37 years and for whom

adult BMI was determined. As noted in this study, 73-93% of subjects who were obese as children (BMI-for-age \geq 95th percentile) were obese in adulthood. These results suggested that obesity tracks from childhood to adulthood, thus it can also be suggested that risk for chronic disease can cross years as well.

Metabolic Syndrome

In addition to predicting adult obesity, higher childhood BMI scores may play a role in determining adult metabolic syndrome (Sun, et al., 2008). Metabolic syndrome is an accumulation of risk factors that help identify individuals who are at risk of type 2 diabetes and cardiovascular disease (Alberti, Zimmet, & Shaw, 2005). The National Cholesterol Education Program's (NCEP) Adult Treatment Panel (ATP) III guidelines (2002) define metabolic syndrome in adults as an accumulation of 3 or more risk factors that include: having a waist circumference \geq 102 cm for males or \geq 88 cm for females, triglyceride levels $>$ 150 mg/dL, fasting high-density lipoprotein (HDL) cholesterol levels $<$ 40 mg/dL for men or $<$ 50 mg/dL for women, systolic blood pressure \geq 130 mm Hg and/or diastolic blood pressure \geq 85 mm Hg, or fasting plasma glucose \geq 110 mg/dL.

A study done by Sun and colleagues (2008) determined a positive correlation between childhood BMI and waist circumference, and adult metabolic syndrome in the same subjects later in life. According to their results, females from the age of 8 to 18 who continually had a BMI that exceeded the CDC age-specific and sex-specific BMI percentiles had much higher risk of development of metabolic syndrome in adulthood. This study also found the same trend in boys; however, their age range was from 5 to 18 years of age. Regarding the findings in this study, it can be implied that higher childhood

BMI scores can be used as a significant marker for the development of metabolic syndrome in adulthood.

Cardiovascular Disease

Childhood obesity is not a benign condition. High levels of serum total cholesterol, low-density lipoprotein (LDL) cholesterol, triglycerides (TG), blood pressure, and fasting insulin levels and low levels of high-density lipoprotein (HDL) cholesterol are all risk factors for cardiovascular disease (CVD) and are associated with increased obesity or BMI (Gidding, Bao, Srinivasan, & Berenson, 1995; Freedman, Dietz, Srinivasan, & Berenson, 1999). Generally, the higher the BMI, the greater the increase in risk factors for CVD (Thompson, et al., 2007). This holds true in the pediatric population (Freedman et al., 1999). Freedman's study was conducted with overweight children and demonstrated that high levels of body fat were associated with elevated levels of total cholesterol, diastolic blood pressure, LDL cholesterol, systolic blood pressure, TG, fasting insulin and low levels of HDL cholesterol. Of the 813 overweight children in the study 58% were found to have at least one risk factor for CVD.

Not only are risk factors for CVD seen in childhood, but the risk factors can track into adulthood. Steinberger, Moran, Hong, Jacobs, & Sinaiko (2001) and Guo, Chumlea and Roche (2002) found that adults who had high TG levels were more likely to have had a high TG level in childhood. This is consistent with Steinberger et al., (2001) finding that adults who were obese during childhood had higher lipid, fasting insulin, and blood pressure levels. Thus concluding these adults were at a higher risk for CVD than those adults who were thin as children.

Type 2 Diabetes Mellitus

Another possible consequence of childhood obesity that has rapidly gained attention is the prevalence of type 2 diabetes mellitus (T2DM) in children (Bloomgarden, 2004; Fagot-Campagna, 2000; Steinberger & Daniels, 2003). Previously, diabetes in children was synonymous with type 1 diabetes mellitus (T1DM) which is defined as the inability of the β - cells of the pancreas to produce insulin. T2DM was associated with middle-age adults or the elderly population (Mahan & Escott-Stump, 2008). It is characterized by insulin resistance, regardless of the amount of endogenously produced insulin. Despite sufficient levels of insulin, the body's insulin receptors do not respond to the insulin and glucose remains in the blood, causing high blood glucose levels referred to as hyperglycemia.

Longitudinal studies have shown that obesity, especially abdominal adiposity, to be a predictor of T2DM among children (Chan, Rimm, Colditz, Stamfler, & Willet, 1994; Hu, Manson, & Stampfer, 2001). Further, a strong relationship exists between childhood obesity and insulin resistance development in early adulthood (Steinberger & Daniels, 2003; Ohlson, Larsson, Svardsudd, Welin, & Eriksson, 1985). These studies may help explain why the prevalence of T2DM in pediatric populations has paralleled that of obesity. The incidence of T2DM now accounts for up to 45% of new diagnoses of diabetes in children (Fagot-Campagna, 2000; Bloomgarden, 2004). Further, a study completed in Cincinnati, Ohio, determined that rates of T2DM in children increased 10-fold from 1982 to 1994 (Pinhas-Hamiel, et al., 1996).

Sleep Apnea

Obesity has also been linked with obstructive sleep apnea in cohort studies (Gupta, et al., 2002). It has been estimated that approximately 13% of children from the ages of 3 to 6 suffer from this condition (Castonovo, et al., 2003). According to a review article by levers-Landis and Redline (2007), pediatric obstructive sleep apnea is “characterized by repetitive episodes of upper airway obstruction, intermittent hypoxemia and hypercapnia, and snoring” (p. 436) and is thought to be due to a narrowing or collapsing of the upper airway. This narrowing or ease of collapsibility could be attributable to excess fat that is stored around the airway, which puts pressure on the airway and may change the size and/or shape (levers-Landis & Redline, 2007; Schwab et al., 2003). In fact, overweight children were determined to be 4.6 times more likely to experience sleep apnea than children of normal weight in a study completed by Redline and colleagues (1997).

Not only are the symptoms of sleep apnea alone detrimental to the pediatric population and their quality of life (Crabtree, Varni, & Gozal, 2004), but obstructive sleep apnea can also cause other problems when left untreated. levers-Landis & Redline (2007) report these issues include “cognitive deficits, behavioral problems (inattention, hyperactivity, aggression, conduct problems, attention-deficit/hyperactivity disorder), mood impairments, excessive daytime sleepiness, and impaired school performance” (p. 436). Further, if sleep apnea is chronically left untreated, it has been shown to be related to cardiovascular disease by promoting high blood pressure (Marcus, Greene, & Carroll, 1998) and metabolic disorders, such as insulin resistance (de la Eva, Baur, Donaghue, & Waters, 2002).

Orthopedic Problems

Physically, obesity can inflict many problems on the skeletal system in the body, especially in the pediatric population (Yanovski, 2001). Overweight and obese children may be more susceptible to bony abnormalities such as “injury to the growth plate which may result in slipped capital femoral epiphysis, genu valga, tibia vara (Blount’s disease), flat kneecap pressure/pain, flat foot, spondylolisthesis (low back pain), scoliosis, and osteoarthritis” (p. 371). These problems are not only painful to children and adults alike, but can cause disfigurement, which may lead to teasing and decreased self-esteem (Crocker, Major, & Steele, 1998).

Psychosocial Issues

Not only are obese children at increased risk for significant physical health problems, but they may face psychological and social consequences regarding their self-esteem, as well. As defined by Leary (1999) in a review article, self-esteem is a gauge that monitors relationship quality between one’s self and others. According to Leary, this definition relies on human beings wanting to maintain personal relationships and belong or be accepted within a group, rather than being ostracized. Puhl and Brownell (2001) point out that obesity is stigmatized such that individuals may be challenged with social exclusion and discrimination throughout their life. In addition, stereotyping obese children and adults as “lazy, ugly, and stupid” (Wardle & Cooke, 2005; Latner & Stunkard, 2003) and teasing about weight (Neumark-Sztainer, Story, Dixon, Resnick, & Blum, 1997) is not uncommon. Children who are overweight or obese quickly become aware of negative views of obesity, which can lead to diminished self-esteem (Crocker, Major, & Steele, 1998). Modest inverse associations between body weight and self-

esteem have been documented in previous studies (Wang & Veugelers, 2008; Wardle & Cooke, 2005). Low levels of self-esteem in children have been linked to a variety of psychological and personal problems that include engagement of high risk behaviors such as absence from school, underage smoking and drinking, drug use, and delinquency and higher risk of psychological conditions like anxiety, depression, and thoughts of suicide (McGee, Williams, & Nada-Raja, 2001; Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005).

Not only does obesity relate to low levels of self-esteem and depression, but a recent meta analysis determined that depressed children had a higher probability of being obese, as well (Blaine, 2008). In support of this finding, another study completed by Dockray, Sussman, and Dorn (2009) examined the relationship of depression and BMI as mediated by cortisol production in the human body as higher levels of cortisol have been shown to be linked to higher rates of obesity, especially around the abdomen (Marniemi, et al., 2002). Researchers determined that depression and BMI in children between the ages of 8 and 13 were significantly related and are both correlated with a higher production and secretion of cortisol (Dockray, et al., 2009).

Generally, obesity is the result of an imbalance of energy. It has been shown that obesity contributes to detrimental health conditions in children, many of which track into adulthood (Freedman, et al., 2005; Guo, et al., 2002; Gupta, et al., 2002; Puhl & Brownell, 2001; Sun, et al., 2008; Yanovski, 2001). To impact the prevalence of these conditions, nutrition and health professionals must understand the factors contributing to obesity, including the development of eating behaviors and the impact on consumption of nutrient-dense foods.

Development of Taste Preferences

There are many factors that contribute to the increased prevalence of childhood obesity, including the taste preferences of children. A taste preference is the decision to choose one food item over another (Birch, 1999). Parents play a significant role in formation of these taste preferences through food choices of the mother during pregnancy and lactation; food availability, accessibility, and exposure during the weaning period and early childhood; and role modeling of eating patterns by parents, siblings, and other significant adults and peers.

Pregnancy and Lactation

Birch (1999) states that mothers have an impact on their child's food preferences beginning early in development, even as early as in utero. Research indicates that food items ingested during pregnancy and lactation can play a role in shaping taste preferences (Birch, 1999). This effect is due to the transmittance of flavors from foods eaten by the mother, into the amniotic fluid and human milk. Birch's findings are supported by Mennella, Jagnow and Beauchamp (2001), who studied post-weaning infant acceptance of a food ingested by the mother during the last trimester of pregnancy and/or the first two months of lactation. In this particular study, pregnant women were assigned to a group in which they either drank carrot juice during pregnancy and water during lactation, consumed water during pregnancy and carrot juice during lactation, or were part of the control in which they only consumed water throughout pregnancy and lactation. This research found that those infants exposed to carrot juice either during gestation or breastfeeding showed fewer negative facial expressions when introduced to a

carrot-flavored cereal than the infants from the control group. Therefore, in utero exposure to foods could play a role in acceptance of similar foods after birth.

Food Availability, Accessibility, and Exposure

After the introduction of solid foods, Birch and Fisher (1998) state “the food environment the parent provides shapes children’s preferences and food acceptance patterns.” Parents control the food environment by providing foods that are available and accessible. One study suggests that a home has a “nutritional gatekeeper” (Rosenkranz & Dziewaltowski, 2008, p. 130) that provides a majority of the food in the home. This gatekeeper is often considered the mother; however, it has been shown that fathers can also be influential in food provision (Stein, Epstein, Raynor, Kilanowski, & Paluch, 2005).

Food exposure is another aspect that is related to taste preferences in children. Infants innately prefer sweet and salty tastes and are generally neophobic and reject new foods (Birch & Fisher, 1998). Recent studies report that repeated exposure to a new food is correlated with an increased liking for the food. It was found that children begin to like new foods after they have been exposed to the food approximately 5-10 times (Sullivan & Birch, 1990; Sullivan & Birch, 1994). Therefore, Birch and Fisher (1998) determined that children like and eat what is familiar and provided to them in their food environment. Examples to reinforce that children eat what is provided to them include studies by Wind et al. (2006) and Vereecken, Henauw, and Maes (2005) that show positive correlations between availability and consumption of fruits and vegetables (Hearn, et al., 1998). These studies provide evidence regarding the importance of healthful foods being available in the home and being served to children on a regular basis.

Role Modeling

Meals are social events that include time with family members and others and an opportunity for children to observe others' eating behaviors. Observation of these patterns is one way that a child develops his or her own eating behavior and preferences because they serve as a model for the child (Birch & Fisher, 1998). One study completed by Birch (1980) determined that preschool children were more likely to develop preferences for and take in disliked vegetables after watching other children choosing and eating those vegetables. Another study by Gibson and colleagues (1998) reported that parental consumption of fruit was associated with their child's fruit consumption. From these studies it can be determined that role modeling food consumption, whether by peers or parents, is important in shaping a child's taste preferences.

Nutritional Concerns Regarding Elementary School-Age Children

The development of taste preferences and the family's eating patterns has a strong impact on the nutritional quality of a child's diet. This is especially true for fruit and vegetable and dairy foods and the environment in which a family consumes their meals.

Fruit and Vegetable Consumption

Epidemiological evidence has shown that a diet abundant in fruits and vegetables is correlated with a decreased risk for chronic diseases such as heart disease, hypertension, diabetes mellitus, and some types of cancer (Bazzano, 2006; van Duyn & Pivonka, 2000). Coronary heart disease accounted for 30.9% of deaths worldwide (Yusuf, Reddy, Ourtpuu, & Anand 2001) and several studies have found inverse relationships between the risk of heart disease and fruit and vegetable consumption (Joshipura, et al., 2001; Bazzano, et al., 2002). Hypertension is another concern for many

people today as a study determined 26.4% of the global adult population had hypertension in 2000 and it is expected that by 2025, 29.2% will have hypertension (Kearney, et al., 2005). Fruit and vegetable intake has been shown to be associated with a lower blood pressure. A study that included 1,710 men from the Chicago Western Electric determined that those men who consumed more fruits and vegetables had a 2.8 less increase in diastolic blood pressure and a 2.2 mm Hg less increase in systolic blood pressure over 7 years than men who consumed less fruits and vegetables (Miura, et al., 2004). Similar results were found in a study of children (Moore, et al., 2005). Children who consumed more fruits and vegetables had smaller gains in systolic blood pressure throughout childhood. In adolescence, those children with higher fruit and vegetable intake had a mean systolic blood pressure of 106 ± 2.9 mm Hg in contrast with those children with lower intakes, 113 ± 1.5 mm Hg.

Type 2 diabetes mellitus may also be inversely associated with consumption of fruits and vegetables. A prospective study that included a cohort of 338 European men showed an inverse association of consumption of vegetables and legumes with impaired glucose tolerance taken from a 2-hour glucose level (Feskens, et al., 1995). A similar cross-sectional study of 1,122 men and women not diagnosed with type 2 diabetes, performed a glucose tolerance test and assessed individual food consumption using a food frequency questionnaire. It was determined that subjects who were not obese and frequently reported consumption of vegetables had a much lower prevalence of abnormal glucose tolerance than those with lower consumption (Williams, et al., 1999). Lastly, fruits and vegetables may have a protective effect on the body against some types of cancer. According to the World Cancer Research Fund and the American Institute for

Cancer Research, “diets high in vegetables and fruits (more than 400 g/day) could prevent at least 20% of all cancer incidence” (World Cancer Research Fund, American Institute for Cancer Research, 1997). Van Duyn and Pivonka (2000) summarized two reviews completed by the American Institute for Cancer Research Fund (AICR) and the Chief Medical Officer’s Committee on Medical Aspects of Food and Nutrition Policy (COMA) that examined the evidence from multiple studies related to the prevention of cancer and fruit and vegetable consumption. Both reviews found at least moderately consistent evidence in relation to esophageal, stomach, and colorectal cancers and both reviews suggested a higher consumption of fruits and vegetables each day. In light of the aforementioned evidence, fruits and vegetables may play a protective role in preventing chronic diseases.

In addition to the health benefits of fruits and vegetables, they are also considered to be important with respect to weight management. One review completed by Rolls and colleagues (2004) describes fruits and vegetables as low energy-dense foods that are high in water and dietary fiber, and low in fat content. These properties contribute to increased satiety (Rolls & Bell, 2000; Yao & Roberts, 2001) and a reduction in energy intake. (Bell, et al., 1998; Yao & Roberts, 2001) Rolls and colleagues (2004) also point out that one benefit of promoting fruit and vegetable intake for weight management is that it is not a message of restriction, but one of increasing foods. Research conducted by Epstein et al. (2001) also provides evidence of the role of fruits and vegetables in weight management programs. In a randomized trial participating parents were either encouraged to increase fruit and vegetable consumption or decrease intake of high-fat, high-sugar foods. After one year, those parents in the group that increased fruit and

vegetable consumption had lost significantly more weight (mean weight loss = 16.4 pounds) than the parents in the reduction of high-fat/high-sugar foods (mean weight loss = 5.4 pounds). Another interesting finding in this study was that the participants that increased fruit and vegetable intake also simultaneously reduced their high-fat/high-sugar food intake. Other studies have also reflected the findings of simultaneous fat reduction with a diet that encourages increased fruit and vegetable consumption (Maskarinec, Chan, Meng, Franke, & Cooney, 1999; Smith-Warner, et al., 2000).

Considering the health benefits of fruits and vegetables, it is concerning that consumption of this food group is low and continuing to decrease among children. A study conducted by Larson, Neumark-Sztainer, Hannan, and Story (2007) aimed to determine trends in fruit and vegetable consumption of participants of Project EAT. The researchers looked at dietary patterns of the original Project EAT cohort and a subsequent Project EAT cohort. Results showed decreases in total fruit and vegetable intake from early adolescence to middle adolescence and from middle adolescence to late adolescence. Oklahomans are also following the trend of low fruit and vegetable ingestion. Compared to other states in the nation, Oklahomans have the lowest fruit and vegetable consumption, with 84% failing to meet the recommendation of 5 daily servings (CDC, 2009). According to the Centers for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey, only 15.7% of Oklahoma youth ate 5 or more servings of fruit and vegetable each day compared to 18.3% nationwide (YRBS, 2009).

Milk Consumption

Adequate milk consumption is even lower than that of fruits and vegetables, with 10.8% of Oklahoma youth reporting drinking 3 or more glasses of milk per day over the

last 7 days, compared to 14.1% nationwide (YRBS, 2009). Low milk consumption may be explained by the high consumption of sugar-sweetened beverages (YRBS, 2009). In 1945, milk consumption was almost 4 times the amount of soft drink consumption (Johnson & Frary, 2001). However, milk consumption trends have changed. Since 1970, per capita consumption of soft drinks per year almost doubled from 22 gallons per year to 41 gallons per year in 1997 (Gerrior, Putnam, & Bente, 1998). Further, analysis of dietary intakes of children and adolescents from NHANES 1988-1994 and 1999-2004 revealed that the consumption of sugar-sweetened beverages (including 100% fruit juice) increased from 242 kcal/day to 270 kcal/day. Combined, the amount of sugar-sweetened beverages consumed accounted for 10-15% of total energy intake in children (Wang, Bleich & Gortmaker, 2008). As with other dietary behaviors, Oklahoma youth fare worse than the national average. The most recent YRBS (2009) reports 41% of youth reported drinking one or more sugar-sweetened beverage each day over the last seven days compared to 33.8% nationally. This is supported by a longitudinal study completed by Fioritio and colleagues (2010). They found that when 5-year-old non-Hispanic white girls self-reported themselves as soda consumers in a dietary recall, they tended to have higher intake of soda and added sugars and lower intake of milk and other important nutrients such as protein, fiber, vitamin D, calcium, magnesium, phosphorus, and potassium during the following 10 years of the study. In summary, with the increase in soft drinks and sugar-sweetened beverages and a decrease in milk consumption, it can be suggested that youth may be replacing milk with sugar sweetened beverages (Friedman, et al., 2007; Gerrior, et al, 1998; Johnson & Frary, 2001).

Trends have also shown that an increase in sugar-sweetened beverages may also play a role in childhood obesity. A study completed by Ludwig and colleagues (2001), found that consumption of sugar-sweetened beverages was significantly correlated with BMI and obesity. In fact, the odds of obesity increased by 60% when accounting for each additional serving of sugar-sweetened beverage. In another longitudinal study, children were asked to participate in a dietary recall for ten years. This study revealed a higher body fat percentage, waist circumference, and BMI-for-age percentile in the observed ten years if consumption of sugar-sweetened beverages was high at age 5, compared to when the study began (Fiorito, et al., 2009).

Similar to fruits and vegetables, milk and milk products are considered an important aspect of a balanced diet, especially in children. Milk provides important nutrients for children's developing bodies, specifically calcium (Gerrior, et al, 1998). Milk and milk products have been determined to be exceptionally high in calcium and contribute approximately three-quarters of the calcium in the United States' food supply. Adequate consumption of calcium is vital to achieve optimal bone mass in children and prevent bone loss and/or osteoporosis later in life. Currently, more than 28 million Americans are affected by osteoporosis (Gerrior, et al, 1998). A lifestyle factor that can reduce the risk of this disease is to obtain recommended amounts of calcium to reach peak bone mass during childhood and adolescence and to maintain bone mass during adulthood and later years.

In addition to the more well-known health benefits, dairy has also been shown to be correlated with the reduction of certain chronic diseases such as obesity, hypertension, stroke, colon cancer, type 2 diabetes mellitus, insulin resistance syndrome, kidney stones,

gout, and cardiovascular mortality (Gerritor, et al, 1998). Correlates of dairy consumption and lower risk of obesity is an interesting topic since obesity has been linked to an increasing number of chronic diseases (Freedman, et al., 2005; Guo, et al., 2002; Gupta, et al., 2002; Puhl & Brownell, 2001; Sun, et al., 2008; Yanovski, 2001). A review by Zemel (2005) brought to light that ideal weight management could be accomplished by consuming three servings of dairy each day. In addition, Mirmiran et al. (2005) determined that an inverse correlation existed between BMI and dairy consumption. As such, dairy not only is important for optimum bone health, but also provides a preventative factor against chronic diseases related to obesity.

Family Meal Frequency

An emerging nutritional concern for youth is the frequency of family meals. Eating together can be a challenge for many families when demands from school, work, and extracurricular activities are taken into account (Neumark-Sztainer, et al., 2000). A pilot study looking at the frequency of family meals found that even though 74% of adolescents report that they enjoy eating family meals, 53% of the same adolescents indicate that their schedule conflicts do not let them eat together on a regular basis (Neumark-Sztainer, et al., 2000). Similar trends were determined from focus groups completed in Oklahoma, in which it was found that eating together is considered important, but time consuming and may not happen as often as the parent would like (Hildebrand et al., 2010). While time may be a constraint, the benefits of family meals are worthy of attention due to their importance in promoting good eating habits and decreasing health-risk behaviors.

Fewer family meals have been shown to result in lower intakes of nutrient-dense food groups such as fruits, vegetables, and dairy (Gillman, et al, 2000; Neumark-Sztainer, Sotry, Resnick, & Blum, 1996; Neumark-Sztainer, et al., 1997; Videon, & Manning, 2003). Gillman and colleagues (2000) also determined that frequency of family dinner was positively associated with “higher intake of several nutrients, such as fiber, calcium, folate, iron, vitamins B6, B12, C, and E” (p. 237). Similarly, those children studied were likely to have lower intakes of high glycemic load foods, saturated and trans fats, fried foods, and sugar-sweetened beverages like soda (2000). In addition to increased consumption of healthful foods during adolescents, family meals have also been found to be linked with healthful meal patterns into young adulthood (Larson, et al., 2007). The purpose of Larson’s study was to study the effect of family meal frequency during adolescence on diet structure and intake in young adulthood. Results determined that a higher family meal frequency during adolescence was positively correlated with consumption of fruit, vegetables, and dark-green and orange vegetables in young adulthood; and negatively correlated with soft drink consumption. Additionally, social eating and meal structure during young adulthood were held in higher priority when the frequency of family meals was higher in adolescence.

Not only are family meals important with regard to nutritional value (Gillman, et al., 2000; Neumark-Sztainer, et al., 1996; Neumark-Sztainer, et al., 1997; Videon & Manning, 2003), they have also been shown to promote family connectedness and decrease high-risk behavior. Family meals provide a time for family members to interact with each other and have the potential for positive interactions that build family connectedness (Neumark-Stzainer, et al., 2000). In other words, eating with family may

help youth feel like they belong and feel valued by others. Resnick and colleagues (1997) have shown that family connectedness is negatively correlated with high risk behaviors such as emotional distress, suicidal thoughts and behaviors, violence, use of cigarettes, alcohol, and/or marijuana, age of first sexual encounters, and pregnancy and psychological problems. Another study completed by Eisenberg, Olson, Neumark-Sztainer, Story, and Bearinger (2004) determined inverse relationships between family meal frequency and substance abuse, low grade point average, depressive symptoms, and suicidal involvement.

Gillman (2000) states in a study that the “proportion of children eating dinner with their families declines with age and has decreased over time” (p. 235). Based on the previous research discussed, it can be suggested that it is important to establish good family eating patterns while children are young to increase nutrient-rich food consumption, promote healthful eating patterns in adulthood, and decrease high-risk behaviors.

Existing Health Interventions – Intellect-Based Nutrition Messaging

Despite efforts by dedicated researchers and educators in the field of nutrition to relay important nutrition information to prevent and alleviate obesity and reduce the risk of chronic disease, overweight and obesity rates have continued to increase (NHANES). This is especially evident in Oklahoma where we rank low in fruit, vegetable, and milk consumption and high in overweight and obesity rates (YRBS, 2009). As such, it can be suggested that traditional nutrition messaging regarding targeting these issues is not effective.

One reason that previous nutrition messaging may not be effective is because it has been predominately intellect-based. For this review, an intellect-based nutrition message is a message that provides information or facts about healthy lifestyle behavior changes. In short, they aim to increase awareness and knowledge concerning specific behaviors and why those particular behaviors would be beneficial to adopt into daily life. While the information is accurate and scientifically based, it is often viewed as unrealistic and burdensome in households with multiple and conflicting priorities (McCarthy, 2009). Furthermore, consumers are overwhelmed with nutrition and health messages. There are approximately 23,000 websites that contain health information, and there are multiple magazines, newspapers, books, and ads that promote health and nutrition-related information that focus on a behavior change. Combined, these sources provide approximately 3,500 health and nutrition messages per day.

Studies have shown that efforts at transferring nutrition knowledge to the public have been successful, but is not being translated into behavior change (Horodyski, et al., 2004). This is demonstrated by a study completed by Horodyski, Hoerr and Coleman (2004) which aimed to test and evaluate a nutrition education intervention. After completion of the study, the researchers hypothesized that by providing education to parents regarding feeding their toddler, their feeding practices and dietary intakes would improve. Following the intervention, both the control and the intervention groups demonstrated increased knowledge of feeding practices. However, when food consumption was reviewed, both the mother and infant diet were lacking. Thus, the intervention was successful at transferring knowledge, but the knowledge did not elicit the desired behavior change.

Current nutrition messages offer facts and action-oriented tips that may lead to a desired health outcome. For example, many nutrition messages focus on consuming more fruits and vegetables in order to help maintain a healthy body weight and decrease risk for chronic diseases. Even though this message is logical and accurate, consumers may not relate to it because for many, reduction of chronic disease and healthy body weight is not a valued outcome to them or they do not believe that the outcome is valuable enough to devote time and effort to enforce. Therefore, while nutrition educators have been providing good nutrition information regarding the behavior changes that need to be made, simple ways to accomplish the desired behavior, and logical reasoning behind making the change; it has not been effective in motivating change. In keeping with the business model, communication of nutrition messages that are consistent with a population's highly valued goals has potential to motivate people to adopt health-promoting behaviors associated with lower rates of childhood obesity and consequences of obesity such as metabolic syndrome, cardiovascular disease, type 2 diabetes, sleep apnea, orthopedic problems, and psychosocial issues.

Emotion-Based Nutrition Messages

Emotional Marketing

Marketing has been used for decades to sell products to consumers using many different strategies. One of these strategies is addressing the values and emotionally based rewards of making a behavior change (USDA, 2008). Barry Feig (1997) refers to this as emotional marketing or Share of Heart. He states: "Share of Heart is how consumers respond to your product emotionally, as opposed to intellectually. It's the connection you make with your consumers – an emotional state in which the consumers

respond through feelings, rather than through cold, hard facts” (p. 4). Thus emotional marketing is impactful to consumers because the focus is on the emotions that are specifically important to them and their individual situation.

One of the major aspects of emotional marketing, according to Feig, is a hot button (2006). A hot button is a prompt that sparks an emotion in someone to carry out or perform some action. In other words, it is an emotional pull for the consumer to the product being promoted. Using hot-buttons, or cues that are related to consumer emotions, is a way to put emotion into a product, which will ultimately persuade the consumer to accept or buy that specific product. Feig states, “No matter what you’re selling, you’re dealing with humans who buy more on emotion than any kind of logical thought process” (2006, p. 4).

Feig (2006) defines sixteen emotional hot buttons that drive consumers to make a purchase or perform an action. These hot buttons include: 1) control, 2) I’m better than you, 3) excitement of discovery, 4) revaluing, 5) family values, 6) desire to belong, 7) fun is its own reward, 8) poverty of time, 9) desire to get the best that can be got, 10) self-achievement, 11) sex/love/romance, 12) nurturing response, 13) reinventing oneself, 14) make me smarter, 15) power/dominance/influence, and 16) wish fulfillment. By determining a specific market’s or even consumer’s hot buttons, a more individualized message can be created to promote the best acceptance of the message.

Future Health Interventions - Emotion-Based Nutrition Messaging

Emotion-based nutrition messages could be a tool to promote better acceptance of nutrition messaging and a subsequent behavior change. McCarthy and Associates (2009) state that “[p]eople make decisions based not on knowledge alone, but on feelings” and

Feig (1997) mentions that emotional needs such as stress relief from smoking a cigarette often come before health requirements. Emotion-based nutrition messages, therefore, should not only include the intellectual nutrition information, but also identify with the important values or emotions of a population. Incorporating a positive emotion or value within the communicated message could invoke the motivation needed to “buy into” the nutrition message and motivate behavior change.

The use of emotion in behavior change interventions is in keeping with the Transtheoretical Theory of Behavior Change (Prochaska, Norcross, & DiClemente, 1994). Emotional arousal is an experiential process that relates to a person’s personal and real-life experiences. It is most effective when a person is in the contemplation stage; that is, they are aware of the need to make a behavior change but lack the needed motivation to move forward (Velicer, Prochaska, Fava, Norman, & Redding, 2004). Then, a situation occurs or a message is received that results in an emotionally charged response creating action. For example, a study conducted by Hildebrand and Betts (2009) found that parents demonstrated belief in the health benefits of serving fruits and vegetables to their children. However, because of the perceived cost and time associated with the behavior, their actions were not consistent with their beliefs; possibly because the behavior conflicted with highly valued goals and aspirations.

To better understand the discrepancy between the demonstrated knowledge and behaviors focus groups were conducted with parents of school-age children (Hildebrand et al., 2010). Findings from these focus groups revealed that parents highly valued family relationships and their children’s achievement and happiness. These values are consistent with several of the emotional hot buttons identified by Feig (2006),

specifically family values, nurturing, and achievement. It was found that parents understood the benefits of a healthy lifestyle that included nutritious meals and physical activity; however, they viewed the nutrition recommendations about nutrition and physical activity as “unrealistic or burdensome or taking time away from family.” Other roadblocks or perceptions that turned them away from the messages were the perception of lack of time (possibly due to multiple priorities) and money to incorporate the behavior change into their lifestyle. In other words, these barriers conflicted with their family-related values. Parents would rather spend time with their family and help their children be the best they can be than spend time and money procuring healthy food choices and physical activity ideas.

Hildebrand et al. (2010) findings were consistent with USDA’s recent emotion-based research entitled *Maximizing the Message* (2008). In this research, investigators used different key words and phrases to capture values thought to be important to parents in order to address important nutrition and diet related behaviors. This study identified core nutrition messages that addressed the five influencers of children’s dietary patterns: role modeling, cooking and eating together, division of feeding responsibility, availability and accessibility, and food preferences, beliefs and asking behaviors. Within the core nutrition messages, primary nutrition behaviors such as eating fruits and vegetables, cooking and eating family meals together, and providing fat-free or low-fat milk at meals were the focus of the messages. All the messages tested were consistent with the 2005 Dietary Guidelines and MyPyramid, were constructed at an easy-to-read 4th-5th grade reading level, and emotionally based so the messages were effective in creating an emotional pull needed to motivate action for a specific healthful behavior.

USDA investigators conducted thirty focus groups that consisted of 140 low-income mothers in eight states between December, 2007, and July, 2008, to provide feedback about the development of messages and supporting content within the messages. Within the focus groups, it was revealed that mothers saw their lives as busy and hectic and that they preferred a message that was practical to their schedules. Participants also liked messages that put themselves in the teaching role to help their children learn new skills to help them in the future. These findings are congruent with findings from Hildebrand et al. (2010) in which Oklahoma parents revealed that their lives were busy and hectic and they desired their children to be successful and happy.

Messages regarding cooking and eating together, received positive feedback as mothers enjoyed the idea of creating memories during mealtimes. It was also noted that some mothers were reminded of family meals when they were children and how they learned healthy nutrition habits from their caregivers. These messages relate to Oklahoma findings in which parents were concerned about spending more time with their family and making family memories.

Mothers of elementary school-age children from the USDA focus groups also connected with messages about making fruits and vegetables more accessible. They liked these messages because they reminded them how to help their children make healthy snack options by keeping fruit and vegetables within reach or visible to children.

Messages that relayed the importance of providing low-fat or fat-free milk at meals were less accepted with the participants at the USDA focus groups as many mothers felt that servings milk with meals was no longer a priority because they can get calcium from other dairy foods. Mothers did connect with the phrases “they’re still

growing” and “help your kids grow strong.” Connection with these phrases coincided with findings from Oklahoma focus groups in which parents believed that their children’s achievement was one of their most fundamental values.

While these messages have been tested with a nationally representative population of parents of school-age children, they have not been developed into fact sheets for use in nutrition education programming. Further, they have not been tested with Oklahoma parents of elementary school-age children. As such, there is a need to determine how emotion-based messages resonate with Oklahoma parents and if their use in fact sheets are relevant, motivating, and within the caregivers ability to complete.

Summary of Literature

As childhood obesity continues to grow, there is increased need for successful nutrition messaging to prevent the rise in obesity and its consequences. Over 15% of Oklahoma youth are obese and there is growing concern regarding obese-related consequences such as obesity in adulthood, metabolic syndrome, cardiovascular disease, type 2 diabetes, sleep apnea, orthopedic problems, and psychosocial issues. Many factors contribute to the increased prevalence of childhood obesity, but one of the major factors is the taste preferences of children. Extensive literature has shown that parents play a significant role in the formation of taste preferences. Pivotal factors include decisions regarding food ingested during pregnancy and lactation; food availability, accessibility, and exposure during early childhood; and parental role modeling of healthful behaviors. A taste preference is the decision to choose one food item over another. Current evidence indicates children more often reach for energy dense, low-nutrients foods. Studies show Oklahoma youth fruit and vegetable consumption is the lowest in the United States and

dairy consumption is also low (YRBS, 2009). In addition to specific foods consumed, there is a need for more frequent meals with family members, as research has indicated family meals help children consume higher levels of healthful foods and decrease participation in high-risk behaviors.

Despite efforts by dedicated researchers and nutrition educators, our current nutrition messaging to alleviate childhood obesity is not effective. Existing literature indicates that intellect-based nutrition messages impact consumer knowledge, but are less motivating for behavior change. Current marketing trends suggest consumers are more likely to make decisions based on emotion rather than knowledge and ample business scenarios such as Starbucks, and recent research in USDA Maximizing the Message and by McCarthy and Associates for Women, Infants, and Children (WIC) further support that point. In the nutrition field, the product is healthful nutrition behaviors. Because of the success emotional marketing has in the business world and in recent nutrition research, the effect of emotion-based nutrition messages designed for parents of elementary school-age children should be examined in Oklahoma.

CHAPTER III

METHODOLOGY

The purpose of this study was to assess parental perceptions of the relevance, motivational value, and ability to perform health behaviors promoted in three emotion-based fact sheets compared to three intellect-based fact sheets. This was a cross-sectional descriptive study, in which both qualitative and quantitative research methods were used to collect data. This study, its protocol, and all procedures were approved by the Oklahoma State University Institutional Review Board (IRB) (Appendix A). The investigators were trained in human subject research practices and completed required IRB training through the Collaborative Institutional Training Initiative (CITI) prior to their involvement with the study.

Fact Sheets

Two sets of three fact sheets were used in the study. Both sets addressed core-nutrition messages consistent with the 2005 USDA Dietary Guidelines for Americans (USDA, 2005). In addition, the messages addressed dietary habits of children that fall short of providing nutrients needed for growth and development (Bazzano, 2006; Neumark-Sztainer, 2006; YRBS, 2009). Each set addressed three behaviors including 1) increasing fruit and vegetable consumption, 2) increasing consumption of dairy foods,

and 3) increasing the number of meals prepared and eaten at home.

The sets differed in that one set tied the nutrition message to familial values important to parents (Hildebrand, et al., 2010). These are referred to as the emotion-based fact sheets (Appendix B). This set was developed based on findings from focus groups conducted by USDA and published in the report titled *Maximizing the Message* (USDA, 2009). They were consistent with focus groups conducted with Oklahoma parents (Hildebrand, et al, 2010). Feig (1997) reported that connecting the message to an important value, aroused emotions, thus motivating action. The emotion-based fact sheets contained tips and recipes to build skills and self-efficacy for conducting the desired behavior. The intellect-based fact sheets (Appendix C) were obtained from the eXtenion Families, Food and Fitness Community of Practice web-site (eXtension, 2011). Each sheet provided factual health information and tips for performing the desired behavior.

Subjects and Settings

The target population for this study was parents of elementary school-age children aged six to eleven years who resided in Oklahoma. A convenience sample of parents was recruited from three different communities in Oklahoma (Alva, Enid, and Okarche) with the help of Oklahoma Cooperative Extension Family and Consumer Science (FCS) educators. Educators were responsible for securing an appropriate meeting location within their community, raising interest regarding the upcoming focus group, distributing promotional flyers, and providing a presence at the focus group. Promotional flyers (Appendix D) for this study were developed by the primary investigator (PI). They provided information regarding eligibility to participate in the study, meeting time and

location, and the principle investigator's contact information. These flyers were printed by the PI and mailed to FCS educators to post in community areas and sent home with school-age children to recruit parent participants. Interested subjects responded to the PI via telephone, e-mail, or in-person and were screened to ensure they met inclusion criteria. In order for a subject to be eligible for participation in this study, they had to meet the following inclusion criteria: 1) being a parent or primary caregiver to a child between the ages of six and eleven and 2) being a resident of Oklahoma. A small, non-monetary incentive provided by the Community Nutrition Education Program at Oklahoma State University included a reusable shopping bag, Expanded Food and Nutrition Education Program (EFNEP) cooking magazine, pencils, lanyard, and foam Frisbee was offered to participants at the end of each focus group.

Data Collection and Instrumentation

Prior to beginning each focus group, participants were informed of the purpose of the study, the procedures that would be followed, and potential benefits and risks of participation in the study. An informed consent document (Appendix E) was provided to all participants and was read and signed. If participants had not been previously screened by telephone or e-mail, they were screened in person to ensure they met the inclusion criteria. All subjects were then asked to complete a general demographic survey (Appendix F).

Quantitative Methods

Following completion of the demographic survey, participants were provided a packet that included the six fact sheets described above (3 intellect-based and 3 emotion-based). A color coded fact sheet scorecard was attached to each fact sheet (Appendix G).

The colors were used by the PI to match responses to the correct fact sheet. Participants were blinded to the color code system. Response bias was reduced by collating the fact sheets in different orders, resulting in fact sheets being reviewed in different orders. Participants were asked to carefully examine each of the fact sheets and write down any thoughts, ideas, or opinions directly on the fact sheets or the corresponding fact sheet scorecard. In addition, they were asked to use a 10-point Likert scale (1 = not at all motivated, able, or relevant to 10 = fully motivated, able, or relevant) to identify how motivational the fact-sheet was to them as an individual, the degree to which they felt able to perform the behavior discussed in the fact sheet, and how relevant the information was to their individual life situation. Approximately thirty minutes was allowed for completion of the fact sheet score cards.

Qualitative Methods

After completion of the fact sheet scorecard, a focus group discussion was used to gain a richer understanding of participants' responses to the emotion-based fact sheets. Participants kept their fact sheet score cards used during the quantitative phase to encourage sharing of the thoughts, ideas, and opinions related to each fact sheet. Development of the focus group question script (Appendix H) was based on the Center for Disease Control's (CDC) VERB campaign message testing script (CDC, 2007). The PI mediated the focus group using the focus group question script to prompt dialogue. Each emotion-based fact sheet was discussed individually. Specific items of interest included 1) interpretation/understandability, 2) likes and dislikes of the messages, 3) relevance of the messages to the participant's life situation, 4) motivational value of the messages, 5) ability of the participant to perform the behaviors in the message, and 6)

whether the message should be changed aesthetically. Participants were encouraged to discuss thoughts, ideas, and opinions they formulated and recorded during the previous step. Scorecards were gathered by the PI after discussion of the respective fact sheet was completed.

The focus groups were audio-recorded (Olympus Digital Voice Recorder, WS-321M, China) and transcribed verbatim by the PI for qualitative analysis. Throughout the focus group, the PI took field notes to collect information regarding trends in preference. After the completion of the focus group, the PI noted any important information.

Statistical Analysis

Quantitative analyses were performed using SPSS 17.0 for Windows. Frequencies of all variables were performed to identify possible data entry errors and were corrected or verified as correct. Demographic characteristics of the sample were defined using descriptive frequency analysis. Likert scale ratings for relevance, motivation, and ability were summed and averaged to obtain mean total scores for each of the six fact sheet scorecards. These measured mean scores were referred to as the preference score. A non-parametric Wilcoxon Signed Rank Test was performed to examine differences between the mean Likert scale ratings of emotion-based and intellect-based fact sheets. Additionally, a second Wilcoxon Signed Rank Test was used to examine further differences between each category (relevance, motivation, and ability) of each emotion-based and intellect-based fact sheet. The significance level for all analyses was set at $p < 0.05$.

Qualitative Analysis

Verbatim transcripts from the focus groups were qualitatively analyzed using content analysis (Harris, et al., 2009). Codes were used to match units of dialogue with the motivational value of the fact sheet, relevance to daily lives, and ability to perform the behaviors. The PI made multiple passes at reading each focus group transcript to identify and code units of dialogue (Lincoln & Guba, 1985; Patton, 2002). Coded units across focus groups were analyzed to establish the major themes. Transcripts and emergent themes were also reviewed by a second person familiar with the research. (Patton, 2002; Harris, et al., 2009). These themes were compared to the field notes taken by the PI.

CHAPTER IV

FINDINGS

In total, 12 subjects participated in the quantitative aspect of this study and 7 (58.3 percent) participated in two qualitative focus groups. Of the 72 quantitative fact sheet scorecards completed and returned, only 1 (1.4 percent) was incomplete and missing data.

Demographics

Demographic characteristics of the participants in this study are summarized in Table 1 (p. 45). All subjects met the inclusion criteria of being a parent to a child between the ages of six and eleven and being a resident of Oklahoma. Mean age of participants was 37 years and ranged from 32 to 42 years. Females represented 100 percent of the subjects. The majority of participants, 91.7 percent, reported having some college education or being a college graduate and 8.3 percent reported having completed high school or a General Equivalency Diploma (GED) program. This group was predominately white, 91.7 percent, with one person reporting their race as Black or African American. Slightly more than half of the subjects, 58.3 percent, reported full time employment (working more than 32 hours each week). Approximately 16.7 percent reported working part time (less than 32 hours per week) and 25 percent were not

employed outside the home. Household sizes were broken down into number of adults and number of children.

Table 1. Demographic characteristics of participants

	N	%	Mean ± SD
Age (mean)	12	100.0	37 ± 5
Gender			
Male	0	0.0	
Female	12	100.0	
Education			
Less than 12 years	0	0.0	
High school or GED	1	8.3	
Some college or college graduate	11	91.7	
Race			
American Indian or Alaskan Indian	0	0.0	
Asian or Pacific Islander	0	0.0	
Black or African American	1	8.3	
Hispanic or Latino	0	0.0	
White	11	91.7	
Other	0	0.0	
Employment			
Work less than 32 hours weekly	2	16.7	
Work more than 32 hours weekly	7	58.3	
Not employed outside the home	3	25.0	
Household Size (mean)			
Adults			
1	2	16.7	
2	10	83.3	
Children			
1	1	8.3	
2	7	58.3	
3	4	33.3	
Annual Income			
<\$10,000	0	0.0	
\$10,000 - \$14,999	1	8.3	
\$15,000 - \$24,999	0	0.0	
\$25,000 - \$34,999	0	0.0	
\$35,000 - \$49,999	1	8.3	
\$50,000 - \$74,999	7	58.3	
\$75,000 – \$99,999	1	8.3	
>\$100,000	2	16.7	

Most households included two adults, 83.3 percent, and 16.7 percent reported having a one-adult household. The number of children in the household ranged from one to three children, with 58.3 percent having two children, and 33.3 percent having three children, respectively. Annual income varied with just over half (58.3 percent) reporting \$50,000-\$74,999, 16.6 percent reporting incomes less than \$50,000 and 25% reporting incomes greater than \$75,000.

Quantitative Results

Using a Wilcoxon Signed Rank Test, each emotion-based fact sheet was compared to its counter intellect-based fact sheet. Table 2 (p. 46) summarizes the results of the comparison of emotion-based and intellect-based fact sheets for overall acceptability. Mean scores for all fact sheets ranked over 5. Emotion-based fact sheets regarding family meals, milk, and fruits and vegetables overall had higher mean scores (8.9 ± 1.2 , 7.8 ± 1.1 , and 8.8 ± 1.0 , respectively) than the corresponding intellect-based fact sheets (8.2 ± 1.3 , 7.3 ± 1.0 , and 8.6 ± 0.8 , respectively). The emotion-based family meal fact sheet had a significantly higher mean score for overall acceptability than the intellect-based family meal fact sheet ($P = 0.017$).

Table 2. Likert scale rankings comparison of emotion-based and intellect-based nutrition messages

	Mean \pm SD	P-Value ^a
Family Meals		
Emotion-Based	8.9 (\pm 1.2)	0.017 ^a
Intellect-Based	8.2 (\pm 1.3)	
Milk		
Emotion-Based	7.8 (\pm 1.1)	0.112
Intellect-Based	7.3 (\pm 1.0)	
Fruits and Vegetables		
Emotion-Based	8.8 (\pm 1.0)	0.303
Intellect-Based	8.6 (\pm 0.8)	

10-point Likert Scale: 1 = low value; 10 = high value

^a Significant at $p \leq 0.05$

To further determine differences between emotion-based and intellect-based fact sheets, scores for relevance, motivation, and ability were compared to each other again using a Wilcoxon Signed Rank Test. Table 3 (p. 48) examines these comparisons. The mean score for relevance of the emotion-based family meals fact sheet was significantly higher than the intellect-based family meal fact sheet (9.0 ± 1.2 , 8.2 ± 1.7 respectively) ($P = 0.034$). There was no significant difference in relevance for the milk and fruits and vegetables emotion- and intellect-based fact sheets.

Table 2 (p. 46) illustrates the emotion-based family meals fact sheet had a significantly higher mean score than the intellect-based fact sheet ($P = 0.017$). In Table 3 (p. 48), the mean motivation score for emotion-based fact sheets regarding family meals were all ranked higher than their counter intellect-based fact sheets. The emotion-based milk fact sheet was ranked significantly higher (7.9 ± 1.2) in motivational value when compared to the intellect-based milk fact sheet rank of 6.3 ± 1.4 ($P = 0.015$). The motivational value for the family meals and fruits and vegetables emotion-based fact sheets were also ranked higher, but were not significant ($P = 0.114$ and $P = 0.083$, respectively), compared to the corresponding intellect-based fact sheets.

Mothers reported greater ability to perform the behaviors described in the family meals and fruits and vegetables emotion-based fact sheets compared to the intellect-based fact sheets. On the other hand, the emotion-based milk fact sheet was ranked lower than the intellect-based, though none of these figures were significantly different.

In summary, emotion-based fact sheets were generally ranked higher, not significantly so, with regard to relevance to the participants' life situation, motivational

value, and ability to complete the messaging, with the exception of relevance of emotion-based fruits and vegetable consumption messaging and ability to serve milk at meals.

Table 3. Likert scale rankings for relevance, motivation, and ability

	Mean ± SD	P-Value ^a
Relevance		
<i>Family Meals</i>		
Emotion-Based	9.0 (±1.2)	0.034 ^a
Intellect-Based	8.2 (±1.7)	
<i>Milk</i>		
Emotion-Based	7.7 (±1.2)	0.190
Intellect-Based	7.2 (±1.8)	
<i>Fruits and Vegetables</i>		
Emotion-Based	8.7 (±1.2)	0.518
Intellect-Based	9.0 (±1.0)	
Motivation		
<i>Family Meals</i>		
Emotion-Based	8.3 (±1.5)	0.114
Intellect-Based	7.6 (±1.8)	
<i>Milk</i>		
Emotion-Based	7.9 (±1.2)	0.015 ^a
Intellect-Based	6.3 (±1.4)	
<i>Fruits and Vegetables</i>		
Emotion-Based	8.4 (±1.3)	0.083
Intellect-Based	7.9 (±1.2)	
Ability		
<i>Family Meals</i>		
Emotion-Based	9.3 (±1.1)	0.160
Intellect-Based	8.8 (±1.2)	
<i>Milk</i>		
Emotion-Based	7.8 (±1.8)	0.184
Intellect-Based	8.5 (±1.4)	
<i>Fruits and Vegetables</i>		
Emotion-Based	9.3 (±0.9)	0.157
Intellect-Based	8.9 (±1.2)	

10-point Likert Scale: 1 = low value; 10 = high value

^a Significant at $p \leq 0.05$

Qualitative Results

Focus group transcripts were qualitatively analyzed using content analysis for common themes and trends by both the PI and a second person with experience with

content analysis. Codes were established to match units of dialogue related to the variables of interest - relevance, motivation, and ability. The PI read each focus group transcript multiple times to identify and code units of dialogue (Lincoln & Guba, 1985; Patton, 2002). If a dialogue unit matched more than one code it was placed under each of the matched codes. Subsequently, the coded units across focus groups were analyzed to determine common themes. Emerging themes were tested for adequacy by independent critiques of another researcher familiar with the project and content analysis procedure (Harris, et al., 2000; Lincoln & Guba, 1985).

The objectives of this study were to determine the degree to which participants felt they were able to perform the behavior discussed in the fact sheet, how motivational the fact sheet was to them, and how relevant the information was to their individual life situation. Responses which support relevance, motivational value, and ability to perform messages from the content analysis, can be found in Table 4, 5 and 6, respectively (p. 49, 50 & 51).

Relevance

Mothers generally reported eating family meals together as an important value relevant to their life situation. Many mothers commented that they desired to have family

Table 4. Qualitative analysis common themes – Relevance

Family Meals	“Meal time is great way to do something as a family”
Milk	“Our family is not very good about drinking milk – serves as a good reminder about how important milk is.”
Fruits and Vegetables	“Like the suggestions on this sheet better than previous fruit/veggie one”
	“Always in need of good after school easy snacks”

meals together and spend time with their children. Consumption of milk was also deemed important by mothers, even when they reported their families to not be consuming milk. Despite reporting a low consumption of milk, mothers explained that their families were getting their dairy from other sources such as cheese and yogurt. Fruits and vegetable consumption was also considered relevant to the mothers' situations because they were able to relate to the message within the fact sheet. Mothers specifically thought the fact sheet was designed to catch their attention.

Motivation

While mothers did comment that the information provided in the fact sheet regarding family meals was not new to them, it did provide some mothers with the motivation to continue trying to have frequent family meals and spend time with each other. Mothers also thought the family meals fact sheet was “empowering.”

Similar comments regarding the motivational value for the milk fact sheet were seen such that mothers want to continue providing their children with milk since it is important to help them stay “strong and healthy”. The fruit and vegetable fact sheet was reported to

Table 5. Qualitative analysis common themes - Motivation

Family Meals	“Does it empower you to want to eat more meals together? Yes I would definitely say that’s true...”
Milk	“It has some good ideas to try to incorporate more dairy in their diet. That is helpful and motivating.” “Keeping them strong and healthy is very motivating to me and important as a mother”
Fruits and Vegetables	“Encouraging pictures and great kid friendly ideas”

have easy, kid-friendly tips and “encouraging pictures” that gave mothers the motivation to make fruits and vegetables available to their children.

Ability

The family meals and milk fact sheets were described by mothers to have provided mothers with easy ideas to increase family meal frequency and serve more milk to their family, which were within their ability to complete. Mothers thought the ideas were “reasonable” and “easy to implement.” Comparable comments regarding the fruit and vegetable fact sheet were also found. Mothers enjoyed the “easy recipes and suggestions.” It was mentioned that providing fresh produce may take time to procure, prepare, and store; however, it is worth the time to reap the benefits.

Table 6. Qualitative analysis common themes – Ability

Family Meals	“These ideas are reasonable and make life easier, such as planning ahead by preparing meat and fresh produce for later use”
Milk	“All suggestions are easy to implement”
Fruits and Vegetables	“Easy recipes and suggestions for keeping veggies accessible to kids”

Other Present Themes

A common theme found within the content analysis was that most mothers had prior knowledge of the nutrition behavior being illustrated in the fact sheets. Mothers had comments such as “Actually I think these are old ideas that people don’t do anymore” and “Nothing’s really new, it’s just a good reminder.” Some mothers pointed out that the messages were ones that they were familiar with, but that they may not do anymore.

Likes

Other aspects of the emotion-based fact sheets that mothers reported liking included the layout of the fact sheet, pictures that caught their eye, and easy ideas to incorporate into their lives. One parent mentioned how they liked "...the nice format. You could easily pick out the sections and what they each discussed", and a second parent agreed by saying, "I liked this one too, this one's layout was really good too." Pictures were well-liked, especially noted from the fact sheet scorecard comments. Recipes provided within the fact sheets, conversation starters, and ideas and suggestions for after school snacks, getting dairy into the diet, and having family meals seemed to be some of the easy ideas that could be incorporated into families' lives.

Dislikes

Major dislikes of emotion-based fact sheets expressed by mothers were having too much text to read and not providing enough information regarding servings of dairy. One mother expressed how she would like to see less information on the milk fact sheet with the comment: "I think there is a lot of information on here that is really good, but there is a lot of information on one page." Another mother stated "I'm all about time...a lot of parents maybe work in a convenience store from 12-8 or 12-9 and when they come home at night, they're gonna pull this out of the child's folder and think 'I don't have time to read this'." Additionally, the milk fact sheet did not provide milk and dairy equivalents or the servings of dairy that a person or child should aim to consume. A mother pointed out "it never really says how much dairy you should have for a day either", and another mother expressed confusion with her statement "And that I think is still my question because like I know you can have different varieties of dairy, but how

equivalent are they to a glass of milk? Are they equal nutrition-wise?” Overall mothers in the focus groups responded more positively to the fact sheets regarding family meals and fruits and vegetables compared to the milk fact sheet.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

The aim of this study was to develop emotion-based nutrition messages for mothers of elementary school age children and compare them to intellect-based nutrition messages regarding serving milk at meals, keeping fruits and vegetables within the reach of their children, and eating more family meals together to determine the extent to which these messages were relevant, motivational, and within the mothers' capability of implementation. Previous focus groups conducted by Hildebrand et al. (2010) that aimed to identify the hopes and dreams of parents that drive their behaviors, found that Oklahoma parents of elementary school-age children perceived intellect-based nutrition messages as burdensome and unrealistic because they did not take into account the parents' perceptions of poverty of time and money. The study did reveal that parents valued family relationships, and the desire to nurture their children's achievement.

Feig (2006) posits that it is these emotions that drive behavior rather than logic. Further, while intellect-based messages that lead to a health benefit may be accurate, they leave mothers unmotivated to take action because they do not value the outcome, do not believe their children were at risk for chronic disease, or do not feel the benefit was worth

the effort (McCarthy, 2008). As such, it was hypothesized that providing nutrition messages that connect with family values and emotions and that are relevant to their lives would be perceived as motivational by mothers.

Emotion-Based Nutrition Message Development

The emotion-based nutrition messages developed and tested in this study had two aims. First was to communicate nutrition messages using Feig's (2006) emotional hot buttons that have been successfully used in the business world, specifically family values, nurturing, and children's achievement. The second aim was to address parents' perception of poverty of time and money by offering tips to provide more fruits, vegetables, and milk and have family meals that are not only quick, easy and cost-efficient to implement. To accomplish these aims, nutrition messages that mothers connected with from the United States Department of Agriculture's (USDA) *Maximizing the Message* (2009) were utilized as primary titles and taglines to be consistent with the emotional hot buttons found to be valued in Oklahoma focus groups - 1) family values and 2) nurturing. (Feig, 2006; Hildebrand et al., 2010).

Family values, according to Feig (2006), may be "the hottest of the hot buttons" (p. 119) and using this hot button may help create the feelings of family togetherness whether selling a vacation or nutrition information. Nurturing is a similar 'family-oriented' hot button in that it satisfies the need to take care of someone or something, specifically a family. In this case, we utilized this button to help mothers feel that they have the opportunity to help their children grow up strong and be the best they can be by providing them with the right nutrition. Additionally, poverty of time was incorporated into the nutrition messages because most parents report being busy and lean toward

convenience (Hildebrand et al., 2010). In the current messages, easy tips for each behavior that are directed at saving time and money were incorporated along with attractive titles and taglines that pull at mothers' emotions to make the nutrition messages more relevant, motivating, and within their ability to complete.

Demographic Comparisons

Findings from the current study demonstrate that participants (n=12) were primarily Caucasian women from northwestern Oklahoma, and approximately 37 years of age. The majority of our subjects reported having some college education or being a college graduate, having two or more children and having two adults in the household, working full time outside the home, and annual incomes of \$50,000-\$74,999. Compared to Hildebrand et al. (2010) focus group demographic findings, the demographic characteristics in the current study differ in gender (primarily female), location (both rural and urban areas of Oklahoma), annual income levels, number of participants (n=55) and race, which was made up primarily of Black/African American (48%) and White (36%). Despite the current small sample size and differing demographic racial characteristics, findings from the focus groups lend evidence that parents hold the same values. Hildebrand et al. (2010) found Oklahoma parents highly value their children's achievement and family values. Further, parents may have been deterred from behavior change due to lack of time and money. Hildebrand and McCarthy (2008) also found their Oklahoma focus groups were congruent with the hopes and dreams of parents in both Massachusetts and Virginia. In the current study, mothers connected with the titles, taglines, and photos that promoted family values and children's achievement through the nurturing and family values hot buttons (Feig, 2006). One mother reported the nutrition

messages were “empowering” and “motivating...and important” to her as a mother. Additionally, mothers thought the tips provided in the emotion-based nutrition messages were “easy to implement” and “reasonable,” which suggests that poverty of time and money was addressed and noted. Another similarity between these groups was that mothers reported understanding the benefits of a healthy lifestyle. In previous focus groups, parents acknowledged that they were familiar with the benefits of healthful eating and physical activity (McCarthy, 2008) as they did in the current focus groups. Mothers thought the messages consisted of nutrition information that they were already aware of, but did not incorporate into their daily lives and one participant called the messages “refurbished.” Therefore, even though differences do exist between studies regarding race, location, income, and other characteristics, the hopes and dreams of parents are consistent.

Preference

While mothers found themselves familiar with the information in the current nutrition messages, this study demonstrated that they preferred emotion-based messaging when compared to intellect-based nutrition messaging. When Likert scale rankings for relevance, motivation, and ability were summed and averaged to obtain mean total scores of preference for each fact sheet (Table 2), emotion-based nutrition messages were overall ranked higher than intellect-based messages. Additionally, the emotion-based nutrition messaging regarding consuming family meals was ranked significantly higher ($p = 0.017$) than its counter intellect-based messaging.

Emotion-based messages were preferred quantitatively and qualitative focus group findings lent evidence to a higher preference. Mothers liked the “encouraging

pictures” and easy suggestions and tips found in each of the emotion-based fact sheets. One mother stated she “liked the suggestions on this sheet [the emotion-based fact sheet] better than the previous fruit and veggie one [intellect-based fact sheet]” Pictures of children and families depicting the desired nutrition behavior were incorporated into the emotion-based messaging in order to further promote the nurturing and family value hot buttons (Feig, 2006). Easy tips for completing the desired nutrition behavior were also included in order to address the issue of poverty of time and money (Hildebrand et al., 2010). Mothers also report that they preferred the easy-to-read, bulleted-layout style that two of the emotion-based fact sheets used over other fact sheets that were primarily composed of lengthy sentences. Because preference was determined by a combination of the relevance, motivation and ability, the higher scores for emotion-based nutrition messaging can be further explained by specific differences in scores of the relevance, motivation, and ability items.

Relevance

In regard to relevance, emotion-based nutrition messages were ranked higher than similar intellect-based messaging, with the exception of serving fruits and vegetables. Furthermore, the fact sheet pertaining to family meal frequency was ranked significantly higher ($p = 0.034$). In the focus groups, mothers reported that family meals were important to them and their families so they could spend time with each other. One mother stated they believed “meal time is a great way to do something as a family.” These current findings are congruent with both USDA’s (2008) focus group findings, which related that mothers liked the idea of creating memories during meals, and were reminded of sharing meals with their families when they were children, and Oklahoma

findings in which parents wished to spend more time with their children and make family memories (Hildebrand et al, 2010). These emotions are closely related to both the family values and nurturing hot buttons (Feig, 2006). Thus, it is important to help the mothers realize not only the benefits of consuming family meals together, but to appeal to their hot buttons using family-oriented titles and taglines that stress being together and promoting the growth and support of their children.

The emotion-based messaging regarding the importance of providing low-fat or fat-free milk at meals was ranked higher in relevance than the intellect-based messaging, though not significantly. In our focus groups, mothers showed an overall lower preference for this fact sheet than the others. Many mothers stated that their families were “not very good about drinking milk”, but thought the information in this messaging served “as a good reminder about how important milk is.” In the USDA focus groups (2008) the milk messages were also less accepted because many mothers felt that serving milk was no longer necessary since they could get their calcium from other dairy sources or their kids did not like milk. These beliefs are reflected in the fact that many children do not consume adequate amounts of calcium-rich foods, and when they do it is frequently in the form of pizza and dairy desserts (USDA Dietary Guidelines, 2010). As such, further refinement and testing of this fact sheet is needed.

Both types of fact-sheets, emotion-based and intellect-based, that aimed to increase the consumption of fruits and vegetables received high scores for relevance (8.7 ± 1.2 and 9.0 ± 1.0 , respectively), but emotion-based nutrition messages were ranked lower than the intellect-based messages. The overall high score for both of the fact sheets is congruent with findings from the USDA (2008) focus groups, in which mother’s

readily connected with messages regarding making fruits and vegetables more accessible for their children. Quantitatively, mothers believe that fruit and vegetable consumption is relevant to their life situation and some qualitative findings also support this. Mothers did mention that they related to the front message that depicts a child coming home from school and being hungry, so mothers are “always in need of good after school easy snacks.” It was also noted in focus group findings that mothers liked the suggestions better when compared to the intellect-based fact sheet. However, mothers also stated that they already used most of the tips for increasing consumption in the emotion-based fact sheet in their daily lives. Because the suggestions were already being implemented, this may explain why mothers reported no difference in the relevance of the two types of fact-sheets.

Motivation

The findings of this study suggest that mothers were motivated by the emotion-based fact sheets compared to the intellect-based fact sheets. Each of the emotion-based fact sheets were ranked higher for motivation, with milk being rated significantly higher than the intellect-based milk nutrition messaging ($p = 0.015$). Qualitatively, each fact sheet was supported by multiple statements by mothers that thought the fact sheet was motivating to them and provided motivating pictures, ideas, and statements. One mother thought that the family meals nutrition messaging was very motivating by stating: “Does it empower you to want to eat more meals together? Yes I would definitely say that’s true.” This empowerment could be a result of the messaging and pictures being focused on both family values and nurturing hot buttons (Feig, 2006). The titles and taglines, such as “make meals and memories together” were taken from USDA’s Maximizing the

Message and is in accordance with findings that Oklahoma parents want to spend more family time together and take care of their families by supplying meals (Hildebrand et al., 2010). Additionally, mothers connected with the picture depicting a family meal. Mothers stated that this picture was “perfect for this fact sheet” and that they wanted to have family meals like that where everyone looks happy. Even though much of the information in this fact sheet was what one parent called “refurbished,” mothers were motivated and empowered to serve more family meals. In other words, while the information was familiar to mothers, the idea of family meals and spending time together resonated with mothers’ strong family values and nurturing pull (Feig, 2006).

Compared to the emotion-based fact sheets regarding family meals and fruit and vegetable consumption, the emotion-based milk fact sheet was ranked lower in motivation overall, but significantly higher than its intellect-based counterpart. This is an interesting finding because it suggests that even though serving milk may not be important to mothers (USDA, 2008), something in the emotion-based fact sheet was favored over the intellect-based fact sheet. In the focus groups, mothers pointed out that this was not their favorite fact sheet, but they did mention that it has “some good ideas to try to incorporate more dairy in their diet that is helpful and motivating” and “keeping them strong and healthy is very motivating to me and important as a mother.” To motivate mothers to continue serving milk and calcium-rich foods the nurturing emotion was used for the milk fact sheet title “They’re still growing” and the tag line “help your kids grow strong.” This supports findings in Oklahoma focus groups (Hildebrand & McCarthy 2008; Hildebrand 2009) where parents voiced a strong desire to help their children grow and be successful. Mothers want to nurture their children to grow up

strong in order to be the best they can be. When children become the best version of themselves, this is the parent's reward or wish-fulfillment, another hot button described by Feig (2006) as helping someone attain their goals or dreams. Most likely, mothers found this fact sheet motivating because the "strong and healthy" message was consistent with their emotion to nurture their children. Interestingly, the picture on the front was not reported as motivational in the focus groups, and some mothers even mentioned that the front was "wasted space" with only the picture and titles.

Despite not finding a significant difference in motivation between the fact sheets focused on serving more fruits and vegetables, the emotion-based nutrition messaging was rated higher for motivation. This slight difference can be better understood by reviewing the qualitative data. Mothers reported this fact sheet to be motivating because of its "encouraging pictures and great kid friendly ideas" despite most of the information being common knowledge to them. This finding again demonstrates that while the information was not new, the way in which the information was presented was consistent with their values rather than in conflict. The title of this fact sheet "Want your kids to be the best they can be? Keep fruits and vegetables within their reach!" was taken from the USDA (2008) messaging and is congruent with the nurturing and wish-fulfillment hot buttons (Feig, 2006). Hildebrand et al. (2010) further supports mothers' feelings of helping their children stay healthy and be the best they can be. By serving fruits and vegetables to their children, mothers would be able to help their children grow and thrive through nurturing and help them attain their goals of helping their children become the best version of themselves (Hildebrand et al., 2010).

Ability

Mothers rated emotion-based nutrition messages higher in the category of ability than intellect-based messages, with the exception of their ability to serve milk. While none of the findings were significant for ability, the qualitative data reflects mothers found the suggestions and tips in all fact sheets as “reasonable,” “easy,” and “do-able.” Specifically for the fact sheet about family meals, one mother stated the ideas in this fact sheet were “reasonable and make life easier.” Mothers also thought the milk fact sheet supplied “suggestion [that] are easy to implement,” despite ranking the emotion-based fact sheet lower than the intellect-based fact sheet. Finally, the fruit and vegetable emotion-based nutrition messaging was thought to include “easy recipes and suggestions for keeping veggies accessible to kids.” In all three of these fact sheets, tips and suggestions were aimed at creating a sense of convenience and ease to address the issues of poverty of time and money, which were found to be significant barriers to Oklahoma parents (Hildebrand et al, 2010). Feig (2006) describes how quality family time (family values) is still highly regarded by many American families, but they are so busy they ignore the things that are most important to them. Therefore, the suggestions within each of these fact sheets had terms such as “fast family meals,” “the whole family eats better and you can save money, too” and “easy make-ahead fruit and veggie snacks,” which not only addressed the healthy behavior, but made it seem reasonable and achievable to mothers.

The emotion-based messaging regarding milk took a slightly different approach and utilized a format that provided “tips from other moms.” This format was chosen because it would not only hit on the nurturing hot-button, but would also make the tips

seem easy and within the mothers' capability to implement because 'other mom's' had already successfully used these tips in their homes. Since the emotion-based milk message was ranked lower than the intellect-based message, it could be due to the different format taken here, but it could also be because it conflicts with another hot-button, family values (Feig, 2006). Parents stated in focus groups that they wanted to spend more time with their families (Hildebrand et al, 2010) and mothers in current focus groups reported that this fact sheet had "too much information" and they would "be more likely to set this aside and not read it." Instead of reading nutrition information, these mothers would be more likely to want to spend time with their families. Overall, despite no significant differences between the emotion-based and intellect-based fact sheets, mothers did find the emotion-based messages to be considered achievable, easy to implement, and within their capability of accomplishing because they address their issues of poverty of time and money (Hildebrand et al., 2010).

Conclusions

The primary objectives in this study were to determine if participants found emotion-based nutrition messages 1) preferable to intellect-based messages, 2) relevant to their life situation, 3) motivational for changing health behaviors, and 4) within their ability to complete.

Null Hypotheses

1. There will be no difference in preference between emotion-based and intellect-based nutrition messages.

2. There will be no difference in scores of relevance between emotion-based and intellect-based nutrition messages.
3. There will be no difference in scores of motivation between emotion-based and intellect-based nutrition messages.
4. There will be no difference in scores of ability between emotion-based and intellect-based nutrition messages.

Based on the quantitative findings, we fail to reject the null hypotheses with the exception of 1) preference for family meal emotion-based fact sheet, 2) the motivational value of the family meal and milk emotion-based fact sheets; 3) and relevance of the family meal emotion-based fact sheet. However, the qualitative data from this study provided further insight into the extent to which emotion-based nutrition messages were considered relevant, motivational, and within participants' ability to complete as compared to intellect-based nutrition messages. Other studies have shown that emotion-based nutrition messages are important in other states (McCarthy, 2008; USDA, 2008) and that Oklahoma parents have specific highly regarded values or emotional hot buttons (Feig, 2006; Hildebrand et al., 2010); however, to our knowledge, this study is the first to examine specifically emotion-based nutrition messages in Oklahoma mothers of elementary school-age children. Additionally, this is the first study to examine emotion-based nutrition messages as compared to intellect-based nutrition messages.

Limitations

This study does have important limitations that should be noted. First, this is a pilot study exploring how emotion-based nutrition messaging resonates with Oklahoma

mothers. In this study, the sample size was small ($n = 12$) and made up of a homogenous group, primarily 37 year old, Caucasian women living in northwest Oklahoma who reported annual incomes of approximately \$50,000-\$74,999. Therefore, results may not be widely generalized to the overall population. However, the emotional value of the fact sheets is corroborated by other studies that have a more diverse sample (USDA 2008; McCarthy, 2008; Hildebrand et al. 2010). Secondly, Okarche participants did not take part in a focus group; instead, they only completed the quantitative portion of this study due to time restraints. In future studies, a larger, more diverse sample could provide further insight into emotions and opinions of Oklahoma mothers. Also, time restraints of parents and Cooperative Extension Family and Consumer Science educators played a role in recruitment for of this study. In addition, because the funding source restricted the use of funds for incentive purposes, there was little to encourage mothers to participate. Since focus groups were carried out in the fall, a future recommendation would be to complete focus groups during a less busy time of year and to provide monetary incentives.

Recommendations

Generally, participants liked the emotion-based nutrition messages and rated them higher, but not significantly higher, than the intellect-based nutrition messages, with the exception of the relevance of serving fruits and vegetables and the ability to serve milk at meals. In the focus groups, mothers repeatedly mentioned higher preferences for the fact sheets regarding fruits and vegetables and family meals, stating that these were “their favorites” and that milk did not provide that connecting power. Focus group findings also establish that mothers found the information to be “good reminders” because they already knew the importance of the nutrition messages. Mothers also stated they did not

like reading too much text and not being provided with information about what a serving of dairy would be as compared to a glass of milk. To further improve our emotion-based nutrition messages for use in nutrition education, efforts should be taken to make the changes that mothers suggested.

Since most mothers positively responded more to the fact sheets regarding family meals and fruit and vegetable consumption, the majority of changes are needed in the milk fact sheet. Recommended actions to improve the milk message would be to add a graph or chart displaying the different types of dairy foods that are equal to a glass of milk and condensing the three paragraphs regarding “Tips from Other Moms” into bullet points that are quicker and easier to read. Further research should be conducted after changes are made to determine that the changes were effective.

Additionally, this study only focused on three important nutrition behaviors for Oklahomans: consuming more fruits, vegetables, and milk and eating more family meals together. Because there is many other nutrition behaviors that need to be further addressed, this research and fact sheet design could be applied to other behaviors such as consuming more whole grains and increasing physical activity. Furthermore, research should be conducted to provide insight as to whether emotion-based nutrition messages are more likely to promote a behavior change than intellect-based messages. By determining which is more likely to create a behavior change, this would further validate the reliability of emotion-based nutrition messaging.

Implications for Nutrition Education

Hildebrand et al. (2010) determined the hopes and dreams for Oklahoma parents consist of recreating family values and helping their children become the best they can

be, but time and money should also be addressed, because these are considered barriers to implementing a nutrition behavior change. The current study found that incorporating these important emotions into titles, taglines, and pictures to draw attention and addressing time and money barriers by providing easy and cost-effective suggestions, were successful in creating emotion-based nutrition messages that were preferred over intellect-based nutrition messages in the small sample size. Therefore, using these emotion-based nutrition messages, or similar message design, could be more beneficial than utilizing previous intellect-based messaging. A similar study conducted by the Massachusetts Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) determined that those traditional WIC education materials were regarded negatively by most parents because they could not relate to whom the message was meant for or the material was outdated (Colchamiro, Ghiringhelli, & Hause, 2010). On the other hand, the new messages that aimed to connect with the needs, interests, and wants of WIC families were regarded more positively because they were able to relate to the pictures of real people, testimonials provided by other parents, and the fact sheets seemed to be made for more intelligent people and “made them think on their own.” Thus, it could be beneficial to determine if the current emotion-based nutrition messages would work in a true education setting.

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APPENDICES

APPENDIX A

Oklahoma State University Institutional Review Board

Date: Wednesday, September 22, 2010
IRB Application No HE1065
Proposal Title: Development of Acceptable Emotion-based Nutrition Messages for Oklahoma Parents of Elementary School-age Children
Reviewed and Processed as: Expedited

Status Recommended by Reviewer(s): Approved Protocol Expires: 9/21/2011

Principal Investigator(s):
Nicole Crossley Deana Hildebrand
12021 NW 136th Terrace 315 HES
Piedmont, OK 73078 Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

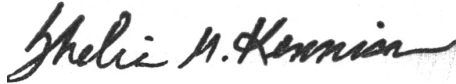
The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

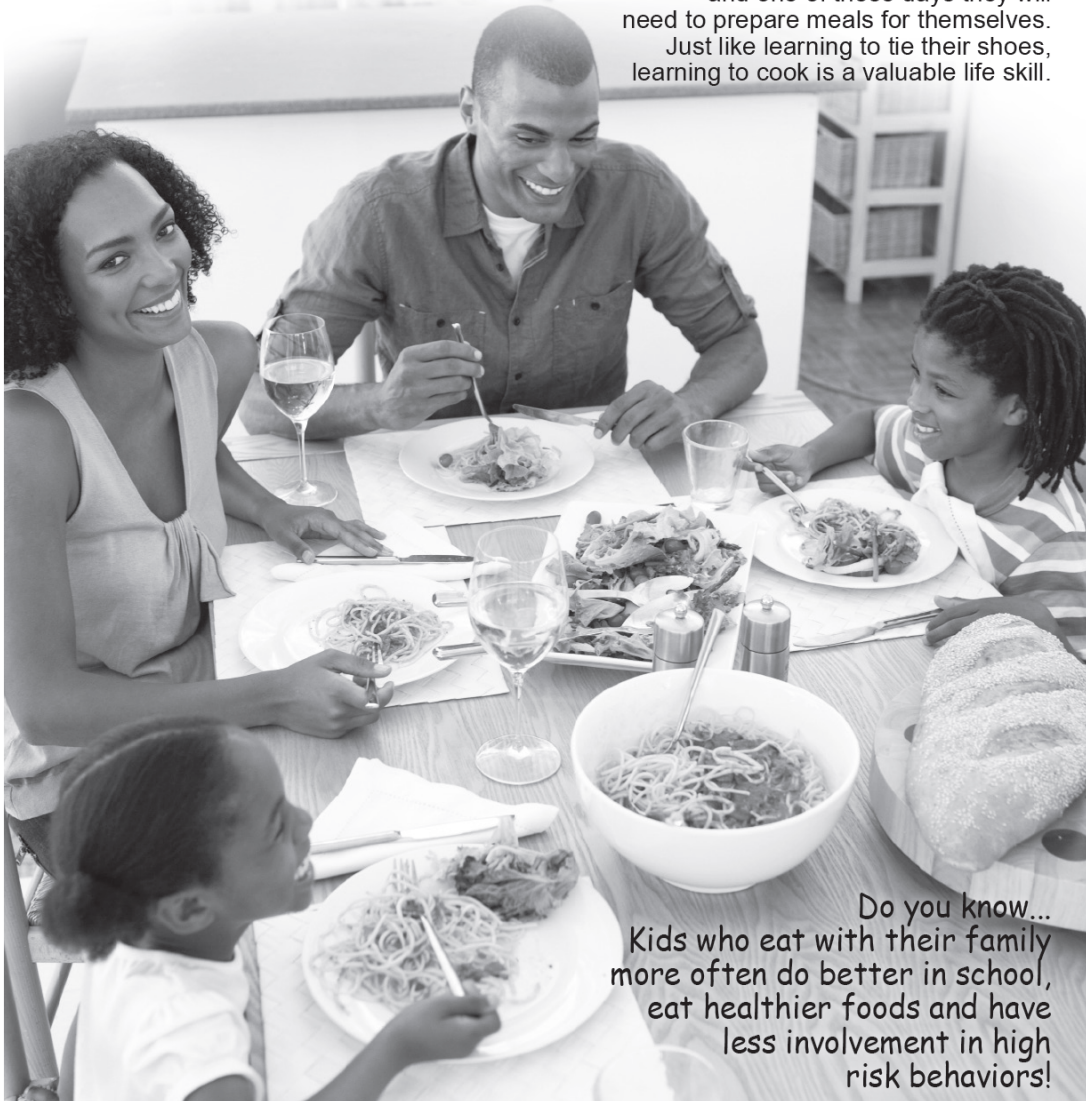
Sincerely,



Shelia Kennison, Chair
Institutional Review Board

Make meals and memories together. It's a lesson they'll use for life!

Kids don't stay young forever,
and one of these days they will
need to prepare meals for themselves.
Just like learning to tie their shoes,
learning to cook is a valuable life skill.



Do you know...
Kids who eat with their family
more often do better in school,
eat healthier foods and have
less involvement in high
risk behaviors!



It takes a little work to bring everyone together for meals. But it's worth it!

The whole family eats better and you can save money, too.

- Focus on the meal and each other. Turn off the television. Take phone calls later.
- Make meals a stress-free time. Talk about fun and happy things. Try using some of the conversation starters below.
- Encourage your child to try new foods. But don't lecture or force your child to eat. Role-modeling is the best way to teach healthful habits.

Meals are about more than nourishment, they are about family.

- Start eating meals together as a family when your kids are young. This way, it becomes a habit.
- Plan when you will eat together as a family. Write it on your calendar. If evening meals don't work, think about breakfast or weekend lunches.
- You may not be able to eat together every day. Try to have family meals at least four times a week.

Fast Family Meals

- Get everyone involved. Kids are more likely to try new foods when they help with the preparation.
- Cook it fast on busy nights. Try stir-fried meat and vegetables, quick soups or sandwiches. Meals don't have to be fancy to be nourishing.
- Do some tasks the day before. Wash and cut vegetables to make a fruit salad. Cook lean ground beef or turkey for burritos or chili. Store everything in the fridge until ready to use.
- Find quick and tasty recipes that don't cost a lot to make at:

www.fns.usda.gov/eatsmartplayhardhealthylifestyle/.

CONVERSATION STARTERS

Be sure everyone has a chance to share!

- **What was the best part of your day?**
- **What made you laugh today?**
- **Did you see someone doing something kind today?**
- **Plan a fun family activity - like a walk after dinner!**

BEEF STIR FRY

Makes 6 - 1 cup servings

- 1 pound round steak, trimmed
 - 1 Tablespoon oil
 - 1 Tablespoon soy sauce, reduced sodium
 - 1/2 teaspoon garlic powder
 - 1/2 teaspoon cornstarch
 - 16 ounces frozen vegetables or 3 cups fresh vegetables - any type; broccoli, green beans, cabbage, onions, shredded carrots, zucchini, bell peppers, or any combination you like.
 - 3 cups cooked rice - try brown rice for a new flavor.
- 1) Preheat oil in large nonstick skillet or wok on high heat.
 - 2) Slice steak thinly into bite size pieces. Put in skillet to brown.
 - 3) Reduce to low heat and simmer for 10 minutes.
 - 4) Combine soy sauce, garlic powder and cornstarch in small bowl.
 - 5) Stir in vegetables and soy sauce.
 - 6) Allow to steam until tender.
 - 7) Serve over rice.

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Want your kids to be the best they can be?

*Keep fruits and vegetables
within their reach!*

***Fruits and vegetables
may not be at the top of
your child's list of favorite
foods, but there are simple
ways to help them eat more!***

"I'm hungry."

*That's the first thing my kids say
when they come through the door.
I need something to feed
them - fast!*

***Here are some ideas
that have worked
for other families.***

- I keep cut up veggies on a low shelf in the fridge and a bowl of fresh fruit on the counter. When I don't have fresh fruits and veggies, I use canned or frozen.*
- I put fresh fruits and vegetables in a place where my kids can see them - they eat them.*
- It takes a little planning, but it's worth it. I know fruits and vegetables help them stay healthy.*

Your kids are more likely to eat foods they are able to see.

- Keep a bowl of washed fresh fruits on the kitchen table for your kids to reach for as an after school snack.
- Put washed and cut fruits and vegetables on a shelf in your refrigerator where your child can see them.

Easy make-ahead fruit and veggie snacks from the fridge!

- Toss veggies with cooked pasta and fat-free Italian dressing. Try adding sliced bell peppers, cooked peas, chopped red onion and shredded carrots for a colorful creation!
- Slice apples. Dip them in pineapple or orange juice to keep them from turning brown. Store apples in plastic snack bags or covered bowls in the fridge to make them a quick and easy snack choice.
- Kids love to dip fresh veggies in low-fat dressings. Cut up veggies like carrots, cucumbers, celery, broccoli and cauliflower and store them near the dip on a low shelf in the fridge.



Dip your favorite veggies in these tasty dips! *(1 serving is 2 tablespoons of dip)*

Honey-Mustard Dipping Sauce

- 1/4 cup fat-free plain yogurt
- 1/4 cup low-fat sour cream
- 2 teaspoons honey
- 2 teaspoons spicy brown mustard

Mix all ingredients together. Store in a covered container in the refrigerator. Makes 4 servings.

Avocado Dip

- 2 medium ripe avocados
- 1 Tablespoon lemon juice
- 1/4 cup salsa
- 1/8 teaspoon salt

Peel and chop avocados. Toss avocado with lemon juice in small bowl. Add salsa and salt. Mash with a fork. Cover and store in the refrigerator. Makes 12 servings.



Dip-a-licious! ***Fruit skewers & dip***

- Put pieces of fruit on a toothpick, skewer, or straw. Try fruits like sliced strawberries, cantaloupe, grapes, pineapple chunks, apples and bananas.
- Cover with plastic wrap and store in the refrigerator until snack time.
- Serve with low-fat strawberry yogurt or another favorite flavor.

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**They
are still
growing.**

**Help them
grow strong
with dairy!**

**"One way that I make sure
my kids get enough dairy
to help them grow strong
is by keeping milk on
the table during meals."**



Tips from other Moms

“I want my kids to grow up strong and healthy and be the best they can be! I know milk is important - but they just aren’t babies anymore. They have milk at breakfast on cereal and sometimes with cookies. At lunch and dinner they like to drink other beverages. Is it really important for them to still drink milk? Can’t they get their calcium they need from other foods? And by the way, does low-fat milk have the same nutrition as whole milk?”

Calcium rich foods are more than milk!

It is important for your kids to consume dairy foods at least three times each day. It gives them the calcium they need for strong bones and to help their muscles work. Dairy doesn’t just mean milk! I like to keep cheese in the refrigerator for after school snacks. A piece of fruit and cheese helps them be the best they can be! So that they don’t get bored, I use different cheeses like American, Swiss, mozzarella, and cottage cheese. Yogurt is another delicious dairy food we like. Instead of ice-cream, we keep cool and creamy flavored yogurts in the fridge for dessert. Some of our favorites are strawberry-banana, vanilla and orange.

Low-fat milk is full of bone-building nutrients

With all the different kinds of milk in the grocery store, it can be confusing to pick the right milk for your family. I had the same problem until I read the nutrition labels. I found out different types of milk have the same amount of protein and calcium, but fat-free and low-fat have less calories and fat, so we took the milk taste challenge. They liked the lower-fat milk and now it’s all we drink. I feel good knowing I’m helping my kids develop good habits that will last a lifetime. You can do it too!

Milk with Meals

One way that I make sure my kids get enough dairy to help them grow strong is by keeping milk on the table during meals. I offer milk at breakfast (like you do!) so they can put it on their cereal. At dinner, I always pour milk to drink instead of other things like soda or juice. Soda and juice have more calories than milk and they don’t have the calcium to help them grow strong bones. My kids actually like to drink milk and I feel good giving it to them knowing the I am helping them be the best they can be!

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LACTOSE INTOLERANT?

Milk and dairy foods are important to help grow strong and healthy bones. So what do you do if you are lactose intolerant? Here are some simple steps to help you get the important nutrients from dairy foods.

- **REDUCE IT.** Consider sampling lactose-free milk for you and your family.
- **SIP IT.** Consume milk with a meal. Try it with cereal, in smoothies, or have a glass with lunch or dinner.
- **STIR IT.** Mix milk with your foods. Prepare oatmeal or soups with milk instead of water.
- **SLICE IT.** Choose cheeses that are naturally lower in lactose such as cheddar, monterey jack, and swiss.
- **SHRED IT.** Sprinkle salads, vegetables, and casseroles with shredded cheese to add more dairy.
- **SPOON IT.** Try yogurts in your favorite flavors with live and active cultures.



Try the Milk Taste Challenge at Home!

- Have your family taste the different types of milk.
- Pour a small glass of each type of milk. Be sure to include fat-free and low-fat milk, but keep it a secret!
- Have each member of the family take turns tasting each milk choice.
- Give each person a pencil and paper to “rank” their choices. Use “1” for the best tasting and “4” for the least favorite.
- Have them show their favorite to the family.
- You may find out that you have a new favorite!

It's a Family Affair: Family Mealtime Behaviors

Last Updated: November 05, 2009

Family mealtime behaviors have an important role at improving the nutrition and health status of the whole family. To establish healthy mealtime behaviors may be difficult at first, and it may not happen all at once so give it time and don't give up. It is important to remember to not get discouraged or feel badly if you are not able to sit down together now and then.

Eat together: It is hard to find time especially for working parents to have meals together with the whole family, but it can be any meal that fits best in your family schedule. It is more likely that your children will eat healthier foods when you eat together¹. Research shows that having family meals is associated with eating more fruits and vegetables, and less fried foods and soda pop.

Regular meal schedule: If children aren't eating meals at home, they probably are buying food away from home at fast-food restaurants and convenience stores. These outlets likely don't carry a good array of nutritious foods like fruits, veggies, lean meats, and whole grains. Children who regularly eat family dinners have diets that are higher in a host of nutrients, including fiber, calcium, iron, folate, and vitamins B6, B12, C and E2.

Healthy attitudes toward food: If a parent is restrictive with their diet, chances are the children will develop unhealthy attitudes towards foods and also be restrictive. Engage your family in pleasant mealtime conversations and avoid discussions regarding weight or weight loss.

Turn off the TV/computer: When the TV or computer is on, you may not be aware of what or how much you are eating. A study found that women who normally control the amount of food they eat tend to consume more calories when they are distracted³. Families who watch TV during meals tend to make less healthy food choices such as consuming more pizzas, salty snacks, and soft drinks and less fruits and vegetables compared to families who do not watch TV at mealtime⁴. Other behaviors such as decreased physical activity and increased snacking may also contribute to the association between obesity and TV viewing⁵. Additionally, watching TV during meals may also take away the time that families can enjoy sharing.

Parents need to be good role models for their children. Older siblings also can set good examples for younger children to follow. Family meals provide opportunities to model nutritious food choices.

Introduce new foods one at a time and serve other well-liked foods at the same meal. If a child does not initially accept a new food, try again. It can take up to 15 times before a child accepts a new food.

Enjoy More Fruits and Vegetables

Last Updated: July 06, 2010

Most of us should eat between 2½ to 6½ cups of fruits and vegetables each day depending on age, gender, and activity level. Many of us, however, don't get enough. Eating fruits and vegetables is one of the most positive health habits that adults, youth, and children can adopt. Virtually all national health organizations emphasize that people who eat a colorful variety of vegetables and fruits as part of a healthy diet are likely to experience many different health benefits. People who eat more fruits and vegetables have reduced risk of chronic diseases, including stroke, diabetes, and some types of cancer. Research also suggests that fruits and vegetables may help in preventing and treating heart disease and high blood pressure. Replacing fruits and vegetables for high-fat foods may also make it easier to control weight.



Try these tips to enjoy more fruits and vegetables:

- Buy and prepare more fruits and vegetables. Keep canned and frozen fruits and vegetables on hand. Buy fresh produce in season.
- Eat a variety of fruits — fresh, frozen, canned, or dried — rather than drinking juice.
- Keep a bowl of fruit on the counter for an easy-to-grab snack.
- Keep baby carrots or other ready-to-eat vegetables on hand.
- Add corn, carrots, peas, sweet potatoes, or beans to soups and stews.
- Top sandwiches with lettuce, tomato, and other vegetables.
- Add bananas or berries to cereal or yogurt.
- Stir fry, experiment with different vegetables, or use what you have on hand.

Re-think Your Drink: Tips for Making Wise Choices

Last Updated: October 28, 2009

Tips for Making Wise Choices

Include milk as a beverage at meals. Choose fat-free or low-fat milk.

If you usually drink whole milk, switch gradually to fat-free milk, to lower saturated fat and calories. Try reduced fat (2%), then low-fat (1%) and finally fat free (skim).

If you drink cappuccinos or lattes -- ask for them with fat-free milk.

As a replacement for soda or sports drinks, dilute 100% juice with water and ice for a refreshing summer drink.

Get in the habit of carrying water with you wherever you go to avoid stopping to buy bottled soda.

Do you want ideas to help your kids eat better but find nutrition information not motivating and unrealistic?

If you are a parent to a child from the ages of 6 to 11 years, please join our discussion!

We will be discussing nutrition fact sheets and what you may like about them. This information will help researchers at Oklahoma State University understand what you like and want to know about nutrition. **Our discussion may take approximately two hours of your time. Any and all information you share will anonymously recorded and kept confidential.**

Location:

Date:

Time:



If you are interested, please call or e-mail

Nicole Crossley

405-863-3622

nicole.crossley@okstate.edu



Deadline for sign up: Date

9/22/10
9/22/11
8-10-65

**CONSENT TO PARTICIPATE IN A RESEARCH STUDY
OKLAHOMA STATE UNIVERSITY**

PROJECT TITLE: Development of acceptable emotion-based nutrition messages for Oklahoma parents of elementary school-age children

INVESTIGATORS

Nicole Crossley, Graduate Student in Nutritional Sciences, Oklahoma State University

Deana Hildebrand, Ph.D, Department of Nutritional Sciences, Oklahoma State University

The focus group facilitator (Nicole Crossley) will cover the highlighted items below prior to participants being asked to sign the consent form.

PURPOSE

This study is being conducted through Oklahoma State University. The purpose is to learn from you what you think about health and nutrition messages so we can develop appropriate fact sheets about a healthy lifestyle that appeal to parents of elementary school-age children. You are being asked to participate because you are a parent of a child between the ages of 6 and 11 years.

PROCEDURES

The project involves evaluating nutrition fact sheets, completion of a one page discussion sheet, and participation in a focus group. You will read and evaluate three fact sheets and complete a one page discussion sheet about each of the fact sheets. Then you will participate in a focus group discussion about your thoughts and emotions regarding the fact sheets. Our focus group is composed of a small number of participants who are asked an organized set of questions in a consistent manner. Completing the discussion page and focus group will take approximately 1 ½ to 2 hours. All information shared in the focus group will be audio recorded for later analysis.

RISKS OF PARTICIPATION

There are no risks associated with this project, including stress, psychological, social, physical, or legal risk which are greater than those ordinarily encountered in daily life. If, however, you begin to experience discomfort or stress in this project, you may end your participation at any time.

BENEFITS OF PARTICIPATION

There will be no direct benefits of participation in this study. You may gain knowledge of nutrition that you may not have had before and an appreciation and understanding of how other parents, like you, make health and nutrition decisions for your children. You will also have the satisfaction of knowing that you contributed important information to a study aimed at helping the health and well being of Oklahoma families.

CONFIDENTIALITY

All personal information shared and collected will be kept confidential and will not be released. The records of this study will be kept private. Any written results will discuss group findings and will not include information that will identify you. All information including but not limited to

APPENDIX E.2

informed consent forms, demographic surveys, attendance sheets, and audio recordings will be kept in a file cabinet that is accessible only to the researchers and their assistants. Research records will be stored securely and only researchers and individuals responsible for research oversight will have access to the records. It is possible that the consent process and data collection will be observed by research oversight staff responsible for safeguarding the rights and wellbeing of people who participate in research. This information and all supplements will be saved only until research is completed or December 2011. Results from this study may be presented at professional meetings or in publications.

CONTACTS

I understand that I may contact any of the researchers at the following addresses and phone numbers, should I desire to discuss my participation in the study and/or request information about the results of the study: Nicole Crossley, Graduate Student, 301 HES, Department of Nutritional Sciences, Oklahoma State University, Stillwater, OK 74078, 405-863-3622 or Deana Hildebrand, Ph.D., 315 HES, Department of Nutritional Sciences, Oklahoma State University, Stillwater, OK 74078. If you have questions about your rights as a research volunteer, you may contact the Oklahoma State University Institutional Review Board (IRB) Chair, Dr. Shelia Kennison, 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

PARTICIPANT RIGHTS

I understand that my participation is voluntary and that I am free to withdraw my consent and participation in this project at any time, without penalty.

If you are still interested in participating, please sign below. Return the signed copy to Nicole and keep a second copy in the event that you have future questions about this study.

CONSENT DOCUMENTATION

I have been fully informed about the procedures listed here. I am aware of what I will be asked to do and the benefits of my participation. I also understand the following statements:

- I affirm that I am 18 years of age or older.
- I have read and fully understand this consent form. I sign it freely and voluntarily. A copy of this form will be given to me. I hereby give permission for my participation in the study.

Signature of Participant

Date

I certify that I have personally explained this document before requesting the participant sign it.

Signature of Researcher (or authorized representative)

Date

Oklahoma State Univ. IRB
Approved <u>9/22/10</u>
Expires <u>9/21/11</u>
IRB # <u>HE-10-65</u>

APPENDIX F

Participant Demographic

Thank you for sharing your thoughts about nutrition messages for your family. As with the other information you have shared, the following demographic information will also remain confidential.

How old are you?

_____ years

What is your gender?

_____ Male _____ Female

How many years of school have you completed? Place an "X" by the best answer.

_____ Less than 12 years

_____ High school graduate or GED

_____ Some college or college graduate

Which race best describes you?

Place an "X" by the best answer.

_____ American Indian or Alaskan Indian

_____ Asian or Pacific Islander

_____ Black or African

_____ Hispanic or Latino

_____ White

_____ Other

How many hours do you work outside the home each week for paid wages or salary?

Place an "X" by the best answer.

_____ Less than 32 hours a week (part-time)

_____ 32 hours or more a week (full-time)

_____ I do not work outside the home.

How many people live in your household?

_____ children (under 18 years)

_____ adults

What is your total annual income before taxes? Place an "X" by the best answer.

_____ less than \$10,000

_____ \$10,000 to \$14,999

_____ \$15,000 to \$24,999

_____ \$ 25,000 to \$34,999

_____ \$35,000 to \$49,999

_____ \$50,000 to \$74,999

_____ \$75,000 to \$99,999

_____ more than \$100,000

Fact Sheet Scorecard

1. How relevant is this fact sheet to your individual life situation?

Not Relevant

1 2 3 4 5 6 7 8 9 10

Very Relevant!

Please explain:

2. How motivated does this fact sheet make you?

Not at all Motivated

1 2 3 4 5 6 7 8 9 10

Very Motivated!

Please explain:

3. How able are you to use the suggestions in this fact sheet?

Not Able

1 2 3 4 5 6 7 8 9 10

Very Able!

Please explain:

APPENDIX H

Question script for focus group nutrition message testing

1. *Comprehension*
 - a. What is the main message in this fact-sheet?
 - b. What made you realize the main message?
 - c. How does the main message make you feel?
 - d. What is the fact-sheet telling you as a parent?
 - e. Are there any other messages from this fact-sheet?
 - f. Did the message grab your attention? Why or why not?
2. *Relevance*
 - a. Whom do you think this fact-sheet is meant for?
 - b. Whom is the fact-sheet talking to?
 - i. You? Any particular type of parent? Particular kids?
 - c. Can you relate to this message? How?
3. *Motivation*
 - a. After seeing this fact-sheet, what ideas did it give you for ways that parents can influence their children?
 - i. What makes you feel that way?
 - b. Are these new ideas or do they reinforce thing you are already doing?
 - i. What works in your house?
 - c. Are there any other fact-sheets or campaigns that have motivated you?
 - i. What made them motivate you?
4. *Ability*
 - a. Which fact sheet are you most able to use the suggestions within the message?
 - b. Which of the fact sheet messages would work best in your home? Why?
 - c. Which of the fact sheet messages would not work in your home? Why?
 - d. Do you have any ideas for getting your kids to eat fruits and veggies, drink more milk, or eat more family dinners?
5. *Likes*
 - a. What, if anything, do you like about this fact-sheet?
 - b. How does it make you feel as a parent?
6. *Dislikes*
 - a. What, if anything, do you dislike about this fact-sheet?
 - b. Is there anything confusing or difficult to understand in this fact-sheet?
 - c. Is there anything about this fact-sheet that turns you off or upsets you?
7. *Change*
 - a. What would you change to improve the message?
 - i. Is anything missing?
 - b. Should any of these fact-sheets be combined? Separated?
 - i. Which parts of them?
 - ii. How?
 - c. Is there something that could improve the overall presentation of the fact-sheet?
 - i. Different wording/photographs/information?

VITA

Nicole Paige Crossley

Candidate for the Degree of

Master of Science

Thesis: DEVELOPMENT OF ACCEPTABLE EMOTION-BASED NUTRITION
MESSAGES FOR OKLAHOMA MOTHERS OF ELEMENTARY SCHOOL-
AGE CHILDREN

Major Field: Nutritional Sciences

Biographical:

Education:

Completed the requirements for the Master of Science in Nutritional Sciences at Oklahoma State University, Stillwater, Oklahoma in July, 2011.

Completed the requirements for the Bachelor of Science in Nutritional Sciences at Oklahoma State University, Stillwater, Oklahoma in 2009.

Experience:

Dietetic Intern (DI) at Oklahoma State University from 2009 to 2011.

Research Assistant (RA) to Dr. Deana Hildebrand at Oklahoma State University from 2009 to 2011.

Teaching Assistant (TA) for Management in Dietetics (NSCI 4573), Science of Food Preparation (NSCI 3133), Medical Nutrition Therapy I (NSCI 4854) and II (NSCI 4864)

Professional Memberships:

American Dietetic Association (ADA)

Oklahoma Dietetic Association (ODA)

Name: Nicole Paige Crossley

Date of Degree: July, 2011

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: DEVELOPMENT OF ACCEPTABLE EMOTION-BASED NUTRITION
MESSAGES FOR OKLAHOMA MOTHERS OF ELEMENTARY
SCHOOL-AGE CHILDREN

Pages in Study: 97

Candidate for the Degree of Master of Science

Major Field: Nutritional Sciences

Scope and Method of Study: Despite efforts to address the increasing prevalence of childhood obesity by dedicated researchers and educators in the field of nutrition, rates in Oklahoma have climbed to 15%. Existing literature indicates that intellect-based nutrition messages impact knowledge, but are less motivating for behavior change. Current marketing trends suggest that consumers are more likely to make a decision based on emotion rather than knowledge. The purpose of this study was to compare the acceptability, relevance, and motivational value of emotion-based nutrition messages as opposed to intellect-based materials. Quantitative and qualitative methods were used to collect data using 12 mothers of elementary school-age children throughout Oklahoma. The variables of interest were measured using 10-point Likert scales (1 = not at all and 10 = very) and these scores were summed and averaged to obtain mean total scores of preference. Wilcoxon Signed Rank tests were utilized to determine differences between emotion- and intellect-based materials. Focus groups were also conducted to gain greater insight to mothers' reactions to emotion-based messages.

Findings and Conclusions: Current findings lend evidence that emotion-based nutrition messages are preferred to intellect-based nutrition messages and are considered relevant, motivational, and within the participants' ability to complete by Oklahoma parents. Mean values for preference of emotion-based nutrition messages were higher than intellect-based messages with the emotion-based family meal message being ranked significantly higher. Additionally, mean scores for relevance, motivation and ability were slightly higher for emotion-based messages when compared to intellect-based with the exceptions being the ability to serve low-fat milk and relevance of fruit and vegetable serving suggestions. Qualitative focus group findings indicate mothers may hold a higher preference for emotion-based messages because they found the information to consist of motivational pictures and messaging they considered relevant to their life situation and within their ability to complete. As such, emotion-based nutrition messages have practical applications in nutrition education efforts and may be more beneficial than utilizing previous intellect-based nutrition messages.

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