

TESTING THE STABILITY OF A HEALTH  
BEHAVIOR QUESTIONNAIRE IN  
SEVENTH AND EIGHTH  
GRADE STUDENTS

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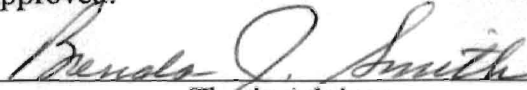
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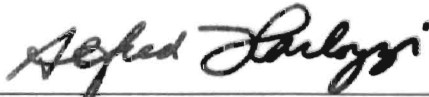
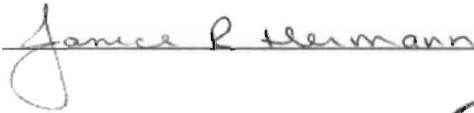
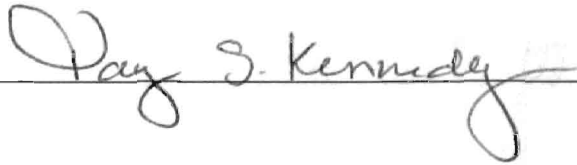
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## CHAPTER ONE

### INTRODUCTION

Over the past two decades, there has been a significant increase in the incidence of overweight adolescents in the U.S. From 1980 to 1999, the prevalence of adolescents who were overweight increased from 5% to 14% (1;2). Currently, more than 1 in 5 youth are overweight and/or at risk for obesity in adulthood (2;3). The greatest increases in the prevalence of overweight adolescents have occurred among minority groups (4), individuals of lower socioeconomic status (5), and in males (6). Although there are many unanswered questions related to these trends, it is likely that a combination of both genetic factors and environmental influences are involved (7).

In general, there are several proposed explanations as to why there has been an increase in the number of youth who are overweight. These include a genetic predisposition (8), an imbalance between energy intake and energy expenditure (9;10), cultural influences (11;12), a decrease in physical activity (13), or some combination of these factors. With regard to the genetic influence, overweight children have a 70% greater chance of becoming overweight adults than non-overweight peers, and this figure increases to 80% if one or both parents are overweight (9). Although these figures do not rule out environmental influences, they do imply that a strong relationship may exist between genetic factors and body weight.



Health habits with a very strong influence on food choices (14;15) and physical activity levels (16; physical activity than recommended (9;18), watch more total calories and calories from fat than previous behaviors, which are first formed during childhood and are more difficult to change as an adult than previous choices an individual makes and the behaviors establish a significant impact on their health throughout life (21)

Overweight children and adolescents are at an increased risk of weight-related health problems. These health conditions and complications (e.g., elevated cholesterol, high fasting glucose, and psychological issues related to social discrimination) in overweight youth are more likely to become insulin resistant or Type 2 diabetes (25;26) during their teenage years. There is also an increased risk for hypertension (27), sleep apnea (23) and many of these health problems have traditionally been considered adult-onset diseases. However, more cases are being reported in adolescents than ever before.

In the U.S., approximately 300,000 deaths a year are attributed to obesity. Obese adults are at an increased risk of premature death. High blood pressure, elevated triglycerides and many other diseases that remain overweight into adulthood are not only more common, but often develop them at an earlier age than in non-overweight individuals. The early onset of a condition such as high blood pressure

complications later in life due to the increased length of time of exposure to the disease state (29;30). As a result, adults who were overweight as adolescents have higher premature morbidity and mortality rates, even if they lose the excess weight in adulthood (31).

The health choices adolescents are making today affect not only the individual, but also the health care system as a whole. Increases in the prevalence of overweight youth have been accompanied by rising medical costs (6). Wang and Dietz (23) reported that hospital discharges among overweight youth increased between 1979-1999 for diseases such as Type 2 diabetes and sleep apnea. This increase in the number of hospital discharges may explain, in part, the increase in cost of care for diseases associated with excess body weight among adolescents (23). Hence, the overall health of the nation, as well as the economic impact of rising medical costs, underscore the need to address the issue of overweight among American youth.

While the increase in the prevalence of overweight adolescents is quite remarkable, weight management can be accomplished without requiring radical lifestyle changes (32). For instance, weight loss of 5 to 15% of body weight can reduce the risk of developing heart disease, decrease blood pressure, lower blood glucose levels and improve cholesterol levels (33;34). The importance of promoting moderate and reasonable health behavior changes related to weight management is even more imperative when working with adolescents. Emphasis should be placed on reasonable changes in eating and exercise behaviors that will support proper growth, and at the same time allow the adolescent to make gradual weight changes (2).

A lifestyle that includes regular physical activity is one very important way that youth can achieve and maintain a healthy body weight. Physical activity is not only important for life-long weight management due to increased caloric expenditure, but also provides other health benefits as well. These additional health benefits include improving cardiovascular function, enhancing bone and muscle strength, and delaying the onset of high blood pressure (35). Current physical activity recommendations for adolescents suggests being physically active everyday or nearly everyday, and participating in activities that require moderate to vigorous effort for at least 20 minutes three times per week (36). Despite these recommendations recent trends indicate that physical activity tends to decline as youth progress through adolescences into adulthood (35).

The decline in activity levels observed during adolescence may be due, in large part, to increasing demands on time and the influence of peers (17). Greater challenges exist to balance time for school, work, and extracurricular activities; however, school-sponsored physical activities have been shown to have a significant impact on an adolescent's physical activity pattern (16;37-39). Other important influences on an adolescents' exercise habits include physical activity levels of parents (39) and parental beliefs associated with activity (40). Therefore, intervention or educational programs are needed that can provide structured physical activity for both youth and parents.

In addition to physical activity, nutrition also plays an important role in weight management. Many of the weight-related diseases previously discussed are associated with increases in caloric intake and a high fat diet (i.e. > 30% of fat in the diet) (6;15;41). Consumption of calories greater than the individual's need, promotes the production of fat cells and an increase in body composition (i.e. percent body fat). This increase in body

fat may lead to overweight or a body mass index (BMI) greater than the 95<sup>th</sup> percentile for youth (6).

A diet that is high in fat, especially during adolescence, can lead to the early development fatty streaks or atherosclerotic plaque (42;43). Atherosclerotic plaque can promote coronary artery disease later in life. Many adolescents have been found not only to have high fat intakes, but also to have lower than recommended intakes of fruits, vegetables, and whole grain products (6). Such dietary intakes may indicate that adolescents are choosing fried and convenience foods over fruits and vegetables. Many convenience items are higher in fat and lower in nutritional value, instead of healthy alternatives with greater nutrient density. Prevention of overweight during adolescence begins with changing dietary behaviors (29;32;44), and aims to improve intake of a more balanced diet (2;32).

During adolescence, dietary habits and food preferences are influenced by parents, and other household members, peers, advertisements, the social context of eating, and variation in taste preferences (45). The eating behaviors developed during this time are often the behaviors carried over into adulthood (14;46). These behaviors include food preferences, the way that foods are handled, and methods of preparation (41;47). As with any behavioral modification, the emphasis should be on reasonable dietary changes that can be maintained indefinitely.

One model that has been used in recent years to understand the process of making an intentional change in behavior is the Stage of Change (i.e. Transtheoretical) Model (48). This model conceptualizes behavioral change as a process and identifies an individual as being in one of five stages of change: pre-contemplation, contemplation,

preparation, action, or maintenance. In addition to describing the different stages involved in behavioral change, the model also outlines the processes for moving from one stage to next. These processes include: self-reevaluation, stimulus control, consciousness raising, self-liberation, counter-conditioning, reinforcement management, helping relationships, dramatic relief, environmental reevaluation and social liberation (48).

The Transtheoretical model has been used in a number of interventions to assess the needs of the target audience (49;50). This assessment provides insight related to an individual or group's readiness for change, as well as guidelines for the processes that are most likely to be effective (48). Such valuable information can assist with the development of programs focused on the population's needs and the appropriate materials to initiate the change process. For example, a person in the contemplation stage needs to be provided information on observations, confrontations and dramatic relief to increase the likelihood of a behavior change. In contrast, as a person in the action stage needs information on how to maintain behavior (48). Therefore, the Transtheoretical Model provides a valuable framework for making behavior change.

The first step in implementing the Transtheoretical Model is to develop an instrument to assess the needs of the target audience (32). An individual must first be associated with a particular stage of change in order to develop materials and provide the support needed throughout the process of change. One of the most convenient ways of assessing the needs and determining the target audience's readiness for change is through a questionnaire. There have been many stage of change questionnaires (51-54) utilized with adults for behaviors such a smoking cessation (54), diabetes (55), and nutritional intake (53), however few questionnaires have been designed for youth.

## Purpose

This project was developed as a part of the Children Youth and Families at Risk (CYFAR) program at Oklahoma State University (OSU). The OSU CYFAR program, funded by the United States Department of Agriculture (USDA), has a two-fold purpose: 1) to provide health education (i.e. personal health behaviors, physical education, nutrition, and food safety) to limited resource youth (i.e. 12-15 year olds) in two communities in northeastern Oklahoma; and 2) to equip these limited resource youth with the knowledge, skills, and behaviors to lead healthier lives. The two communities were identified based on the high percentage of low income, Native American families and the incidence of overweight among the youth. The purpose of this project was to develop an assessment tool utilizing the Transtheoretical Model to evaluate the target population's current level of readiness for change in health behaviors related to weight management, and to serve as a guide for future program development. Based on this purpose the following objectives were developed.

## Objectives

Objective 1: To develop a Health Behavior Questionnaire appropriate for seventh and eighth graders focused on physical activity, nutrition, and food safety.

Objective 2: To evaluate the stability of the Health Behavior Questionnaire through test-retest experimental design.

Objective 3: To develop a Stage of Change Questionnaire by modifying select questions from each subject area (i.e. nutrition, physical activity, and food safety) of the Health Behavior Questionnaire to a stage of change format.

Objective 4: To assess the appropriateness of the content and format of the Stage of Change Questionnaire for seventh and eighth graders based on qualitative data from group interviews.

### Hypothesis

Hypothesis 1: The Health Behavior Questionnaire developed for seventh and eighth graders will provide information about nutrition, physical activity, and food safety behaviors through consistent answers using a test-retest design.

Hypothesis 2: The interviews will provide qualitative information regarding the appropriateness of the Stage of Change Questionnaire in terms of comprehension and format, and determine the questions that require further modification.

## Definition of Terms

Adolescent/Youth—for the purpose of this study the definition of adolescent or youth will refer to an individual ages 12-19 unless a specific age group is identified.

Much of the cited literature uses the term child or childhood when referring to a population including those ages 12-19, however for purpose of this research the term adolescent or youth will be used for all references of the study population.

Behavior—for the purpose of this study the definition of behavior is an action or an activity that is repeated over time and is or becomes a regular part of daily life.

Moderate Activity—for the purpose of this study moderate activity is defined as any activity in which an individual can participate at a rate that does not result in a significant increase in the rate of respiration or perspiration.

Overweight—when working with children in the U.S. it is important to note the term overweight should be used instead of the term obese. Overweight is defined as a BMI greater than the 95<sup>th</sup> percentile for gender and age. It should be noted that there is use of the term obesity in much of the cited literature, however for the purpose of this research the term overweight will be used for all references to youth who meet the definition of overweight as previously stated.

Physical Activity—refers to movement of the body, or its parts, in a way that increases heart rate and promotes changes in cardiovascular function for reduction in the risks of heart disease and to promote a healthy lifestyle.

Stability—refers to the consistency in a test or form from one use to the next or the consistency over repeated use of a measurement based on the comparison of group means.



Vigorous Activity—refers to activities where one's heart rate and respiration rate is increased, and perspiration often occurs.

Weight-Related Disease—refers to those diseases or conditions often associated with excess body weight such as type 2 diabetes, hypertension, and sleep apnea.

## Assumptions

The basic assumptions associated with this study were made in relation to the study population and test administration. First, the investigator assumed that all participants were similar in age, education, culture, and demographic characteristics such as socioeconomic status. The second assumption related to the study population was that participants completed the questionnaire during both the test and retest to the best of their ability, and answered questions based on their actual behavior rather than the perceived “right” answer. Third, the researcher assumed that the test administrator (e.g. classroom teacher or 4-H administrator) gave both the test and retest questionnaire in the same manor. For example, the purpose of the questionnaire was explained fully each time the questionnaire was given. The fourth and final assumption was made by the investigator was the administrator accurately matched each participant’s test and retest questionnaire before removing the identifying markers.

## Limitations

The participants in the study were seventh and eighth graders recruited through school, extracurricular activities, and community events. Although the age of the participants ranged from 12 to 15 years, all subjects were currently in either the seventh or eighth grade. Participation in the study was limited by both parental consent and participant affirmation.

The Health Behavior Questionnaire developed for this study had more than one question in some cases to assess a particular behavior. Previous studies have used this method of repetition to ensure consistent responses, however, the repetition may have caused participants to answer without fully reading the question or to lump the question in with a previous question when assessing their own behavior.

A limitation associated with the Stage of Change questionnaire is the cognitive development of the population (56). For example during this time of development youth are not able to recollect the behaviors of the previous six months, making it difficult to determine those individuals in the contemplation and preparation stages. Another limiting factor related to Stage of Change is the development of independence and identity during this time (56). For example, if an individual cannot yet separate themselves from the behavior of their parents it can give a false association to a particular stage (i.e. an individual may relate to preparation when they are in fact in contemplation, because of parental behavior).

## CHAPTER TWO

### REVIEW OF THE LITERATURE

#### Prevalence

In the U.S. there have been significant increases in the incidence of overweight youth over the past two decades. Between 1980 to 1999, the prevalence of overweight increased from 4% to 13% in children ages 6-11, and from 5% to 14% in adolescents aged 12-19 years (20;57;57). Today, roughly 8 million youth have a BMI greater than the 95<sup>th</sup> percentile, making overweight a major public health problem (58;59).

Demographically, there are a number of trends emerging among overweight youth including cultural, gender, educational, and socioeconomic trends. For example, the incidence in overweight adolescents in minority cultural/ethnic groups such as Hispanics and African Americans are higher than their Caucasian counterparts (6;60). Odgen and colleagues (4) found that 23% of non-Hispanic Black and Hispanic youth ages 12-19 were overweight, while only 12% of non-Hispanic Caucasian youth in this same age group were categorized as overweight. Native Americans are at even greater risk than their Caucasian peers with approximately 40% of the youth, age 5-18 years, classified as overweight (6;61). In terms of gender, Neumark-Sztainer and colleagues (6) reported that more often boys have BMI's greater than the 95<sup>th</sup> percentile than girls. Girls, more often than boys, were found to be consuming less than 30% of their calories from fat (6). Power and colleagues (5) described an inverse relationship between the incidence of overweight youth, and socioeconomic status and educational level. Thus their data

support the concept that the risk of obesity increased as education and socioeconomic status decreased. While the increase in the incidence of overweight youth is alarming, these demographic trends also highlight the need for interventions that specifically target non-Caucasians, males, and lower socioeconomic groups.

In addition to the increase in incidence of overweight children and adolescents that have occurred over the past twenty years, it is important to note that similar trends in weight gain have also been observed among adults (62). In 1980, 47% of the adult population was considered overweight, but by 1999 the prevalence of overweight adults increased to 64% of the population (62). Several studies have attributed this increase in the overweight population, both adult and youth alike, to a combination of genetics, decreased participation in physical activity, and an increase in the consumption of calories (7;20;58;59). Because little can be done at this point with regard to genetics, the focus for interventions and educational programs has become behavior modification (e.g. adequate physical activity and a balanced diet) early in life to reduce the risk of overweight obesity (9;10;32).

#### Current Practices in Adolescents

While there are a number of lifestyle behaviors that may contribute to these weight-related trends among American youth, two key behaviors are certainly calories consumed (i.e. nutrition) and calories expended (i.e. physical activity). As adolescents grow and develop through their teenage years, their level of physical activity tends to decline (35). The greatest decreases in physical activity occur before or during puberty (63). Among the activities that youth (i.e. 9-13 years of age) do continue to participate in,

free-time physical activities are some of the most common (18). In addition to physical activity, nutrition also plays a significant role in the development of overweight. The National Health and Nutrition Examination Survey III showed that currently only 34% of girls, and 27% of boys aged 12-19 years meet the nutritional recommendations to consume less than 30% of their calories from fat and less than 10% from saturated fat (64). Other studies (6;19) have reported similar findings regarding caloric intake and consumption of fruits and vegetables. The combination of a sedentary lifestyle; and a dietary intake high in fat and low in fruits and vegetables is likely to contribute to the development of chronic diseases (65).

#### Health Risks for Overweight Adolescents

Adolescents who are overweight are more susceptible to a variety of health problems during their teenage years. These conditions may range from an increased risk of cardiovascular disease (66) and abnormal glucose metabolism (67;68) to sleep apnea (69), and asthma (69). Although they may not be symptomatic during adolescence, overweight youth are at increased risk of developing fatty streaks within their arteries, which are often the initial signs of atherosclerosis (70). Additionally, overweight adolescents are at increased risk of developing high blood pressure, elevated plasma insulin, a more atherogenic lipid profile (i.e. elevated serum low density lipoproteins (LDL) and reduced serum high density lipoproteins (HDL)) (10;68;71). In fact, the combination of abnormal blood pressure, insulin, and lipids has become so common that it is now referred to in the literature as syndrome X or insulin resistance syndrome in biomedical literature (71). Syndrome X is considered to be an indicator of the pre-

diabetic state (71). Insulin resistance occurs when the cells are no longer sensitive to insulin, causing the pancreas to produce greater amounts of insulin in attempt to move glucose from the bloodstream into the cells. Eventually this hyperinsulinemic state may develop into Type 2 diabetes.

Syndrome X occurs in overweight youth more often than their non-overweight peers (72), and is associated with increased risk of both Type 2 diabetes (25;68) and cardiovascular disease (73). Often, Type 2 diabetes is treatable with moderate changes in food choices and an increase in physical activity (68;74). Thus, treatment of Type 2 diabetes in adolescents is similar to that of adults, with diet and exercise used to reduce or maintain body weight and control blood glucose levels (25). The consequences of developing diabetes at a young age may, however, be more detrimental than development of Type 2 diabetes during adult years. To date, no studies have shown the effects of Type 2 diabetes during adolescents on diabetes-related complications such as nephropathy, retinopathy and atherosclerosis. Nonetheless, in adults the duration of diabetes is known to be closely related to the incidence and severity of these complications and the same is likely to be the case in youth as well (25).

The increase in overweight adolescents and incidence of weight-related disease has been met with an increase in the cost of treatment of overweight-related hospital admits (23). Wang and colleagues found that the number of hospital discharges due to diabetes nearly doubled, and those due to overweight-related conditions tripled among youth admitted to hospitals or other care facilities (23). This is further supported by children and adolescents healthcare costs related to overweight being \$127 million

dollars from 1997-1999 (75). The costs associated with such conditions are only expected to rise with the increasing incidence of overweight adolescents in the U.S.

While being overweight in adolescence may be associated with health risks and development of certain weight-related diseases, other factors including social discrimination and depression affect overweight youth (10;76). Mustillo and colleagues (24) found that males who were overweight during their youth were more likely to be depressed, and both overweight males and females were likely to have oppositional defiant disorder. Overweight youth with diabetes are also at a greater risk of developing eating disorders such as anorexia (77). These psychological disorders associated with overweight youth are also likely to affect behaviors in adulthood, if the psychological problem is not also addressed during adolescence (76).

#### Overweight Adolescents' Health Risks in Adulthood

Overweight youth are not only more likely to experience the onset of typical adult diseases at an earlier age, but are also more likely to be obese adults (10;31). Unhealthy practices set during adolescence increase the likelihood of remaining overweight into adulthood (16). As overweight and obese adults, they will be more likely to encounter diseases associated with excess body fat such as atherosclerosis (43;70), diabetes (10;25), hypertension (27) and sleep apnea (33). Adults who are overweight are twice as likely to have hypertension, and have a 50-100% greater risk of premature death from all causes compared to non-overweight adults (9). Adult costs related to overweight or obesity were estimated at \$31 billion dollars or 17% of overall medical expenditures in 2000 (75).



Hence, healthy weight management programs targeting youth are needed to reduce and/or prevent the occurrence of such weight-related health problems in adulthood.

### Health Behaviors and Overweight Adolescents

Adolescence is a critical time in the development of lifestyle behaviors. Janz and colleagues (21) found that, in general, behaviors developed during childhood (i.e. before or during early puberty) were more likely to be continued into early adult years. Similar observations have also been made specifically related to physical activity and nutrition behaviors (14;43). These health behaviors associated with weight management are influenced by a variety of factors in the individuals environment. Some of the key environmental factor include parental influence (14;39), peer and social support of a behavior (17), and socioeconomic status (5).

The parent's lifestyle choices are believed to have the most significant influence on food and activity choices in their children (14;16;17;39;78). Parental physical activity habits are strong predictors of the activity patterns of overweight youth (39). For example Kalakanis and colleagues (39) found that parental activity was an important indicator of child activity in terms of intensity and frequency of moderate to vigorous physical activity bouts. Parental food choices also play a role in the consumption of either healthy or unhealthy food choices. This parental influence was demonstrated in a study by Neumark-Sztainer and colleagues (14). The authors found that inceasing the availability and promotion of convenient foods (i.e. foods that do not have to be prepared) in the environment improves adolescent nutritional intake. In other words, if the parents made

healthy foods, such as fruits and vegetables were readily available, the likelihood of them being consumed would be increased.

Other factors found to impact the development of lifestyle behaviors in adolescence include peer support (17) food acceptability/availability (14) and cultural beliefs (12). For example, Prochaska and colleagues (17) found that parent and peer support increased the self-reported physical activity levels. Neumark-Sztainer and colleagues (14) found that many factors related to the acceptability, availability and convenience of foods increased the likelihood of them being consumed. This same study also found that other environmental influences, including the understanding the health benefits of certain foods, influenced the consumption of those foods. Furthermore, Gittelsohn and colleagues (12) found that cultural beliefs affect food consumption practices. For instance, in Native American cultures many parents encourage the consumption of foods at any time because they are often afraid their children do not get enough to eat, or are too thin (12). Consideration of all of these influential factors is critical when attempting to alter behavior related to weight management.

### Physical Activity and Weight Management

One of the most widely supported explanations for an increase in overweight youth is a decline in physical activity (13) and increase in television watching (19). Myers and colleagues (36) found that males were more active than females; African Americans were more sedentary than Caucasian peers; and that 5<sup>th</sup> and 6<sup>th</sup> graders had less sedentary time than 7<sup>th</sup> and 8<sup>th</sup> graders. Lowry and colleagues (19) found that television watching was associated with a decrease in physical activity of Caucasians, but

associated with an increase in physical activity in African Americans. This study also reported that watching more than 2 hours of television a day was associated with overweight in both Caucasian and Hispanic females (19). These findings indicate that the combination of a decline in physical activity and an increase in sedentary activities has resulted in an even more positive energy balance and is likely contributing to weight gain among American youth.

Regular physical activity is known to provide a number of health benefits including increased energy expenditure, improved cardiovascular function, and weight management (35;63). Physical activity has been shown to increase the percent of lean muscle mass in the body (20;35) and overall calorie expenditure. Minimal amounts of regular physical activity (i.e. caloric expenditure of approximately 150 calories a day) have been shown to reduce the occurrence of coronary events (79).

In addition to benefits related to caloric expenditure, physical activity can also have a direct effect on chronic diseases that are associated with excess body weight. Recent reports have suggested that decreasing body weight to within a healthy range may decrease the symptoms of disease, reduce or reverse the effects of chronic disease, and allows for an individual to reduce or eliminate the need for some medications (26;68;70;74). Regular physical activity, especially aerobic exercise, can contribute to the management of conditions such as Type 2 diabetes and heart disease (32;80-82). These benefits are achieved through enhanced insulin sensitivity and improved cardiac function (35).

Due to budgetary restrictions many schools are decreasing opportunities for physical education, which is reflected in the large decline in students participating in

daily physical activity (35;83). Overweight adolescents who reported no physical activity during the school day had less overall physical activity (36). Approximately 77% of adolescents age 9-13 participate in free-time activity and only 38.5% of adolescents age 9-13 participated in organized activities, i.e. sports (18). The amount of physical activity individuals participate in is largely influenced by after-school activities (37) with physical education classes provided for only 25% of 8<sup>th</sup> graders and 5% of 12<sup>th</sup> graders (38). However, adolescents who reported no physical activity during the school day had less physical activity overall than non-overweight peers (36). Due to budgetary restrictions, alternate ways of increasing activity in school (e.g. fitness breaks) may need to be considered (84).

The influence of a physically active lifestyle initiated in childhood and continued into adulthood was examined in the Muscatine Study (21). In this study, Janz and colleagues reported that favorable health outcomes were observed later in life when youth were encouraged to participate in regular physical activity through school and family support, and efforts are taken to maintain physical fitness through adulthood (21). Hence the importance being physical active early in life and maintaining regular exercise into adulthood provides a lifetime of benefits.

Initiating a routine that includes physical activity during adolescence is much easier if a strong support system is in place at home and with peers (17). Kalakanis and colleagues (39) showed that increasing parental knowledge and practice of regular physical activity helped improve youth's participation in regular physical activity. Other studies (39;40) have shown that familial influences (e.g. including parental activity, support, and beliefs) are very important when implementing change among youth. In

contrast, many minority youth may not feel safe being active within their neighborhood, and often do not have a community recreation center, or access to a safe environment (18;85). Often these youth are left with limited options for exercise. For many minorities, school activities or physical education are the only opportunities for regular physical activity (37;83). Therefore, the barriers to a lifestyle that includes regular physical activity may be great, especially for some minority youth.

Some of the most successful physical activity intervention programs include *Paving the way for Physically Fit and Healthy Children* (86) and *Promoting Better Health for Young People Through Physical Activity and Sports* (87). *Paving the way for Physically Fit and Healthy Children* is a program that focuses on the development of physical activity habits and healthy nutrition practices through school and community awareness (86). *Promoting Better Health for Young People Through Physical Activity and Sports* promotes physical activity through education for parents, school physical education, after-school programs, and sports/recreation participation to help prevent cardiovascular disease and other health problems (87). Both of these programs support overall physical fitness and focus less on weight loss, an important point to consider with youth who are still growing. Other successful programs include *Shapedown* (88) and *Just for Kids* (89). The *Shapedown* program and the *Just for Kids* program promote physical activity along with healthy eating habits through moderate changes in daily behaviors. As evidenced by these successful programs, the importance of a support system that includes family, schools, and peers as should be considered (29).

## Nutrition and Weight Management

As previously mentioned, nutrition also plays an important role in the management of body weight. A healthy, well-balanced dietary intake has been associated with consumption of nutrients from a variety of food groups, and regular intake of fruits, vegetables, and whole grains. From 1977 and 1996, increases in caloric intake were greatest among fast food with calories from hamburgers increasing by 97 kcal, calories from french fries by 68 kcal, and calories from soft drinks increasing by 49 kcal (11;15). In part, the increase in caloric intake associated with fast food consumptions can be attributed to increases in portion sizes (15).

These increases in food portions were greatest in fast food restaurants and in homes (15). Food norms continue to change today with larger portion sizes becoming more common as the “standard” serving sizes (11;15). For example, the portion sizes at most marketplaces exceed the standard portion size by at least 2-fold (90). The general public becomes accustomed to oversized portion sizes, which may result in underestimate of caloric intake when self-reported dietary assessment is performed. However, the effects of increasing portion sizes at home and at restaurants (11;15) are reflected in increase in dietary fat consumed (6;11;41) and prevalence of overweight adolescents (91).

In addition, the increases in fast food consumption and portion size, there is also a lack of variety in the typical American diet (6). The lack of variety is reflected in distribution of foods consumed from the various food groups. For example, Petrillo and Meyers (41) found that most adolescents did not meet fruit and vegetable recommendations. Furthermore, most of the servings of vegetables the adolescents did consume were in the form of fried potatoes. Twenty-nine percent of adolescents ate less

than one serving of vegetables that was not fried (41). Choosing foods from all food groups, including fruits and vegetables, is an important component in weight management. Even with moderate changes in nutritional intake, great improvements can be made in health risks and weight management (32).

There are many different factors that influence eating habits including food availability, food preferences (14), cultural differences (12), and the perceived purpose of food (46). Food preferences of adolescents are most closely linked with the convenience and availability (i.e. foods purchased by the parent and available in the home are the food consumed) (14). Youth are also subject to cultural influences and beliefs. In some cultures sweet foods are used as a reward at home or school (12). Foods may also serve various purposes for different individuals. For example, some individuals may overeat because of an emotional tie to food, while others may eat to reward themselves for having a good day (46). Along those same lines some individual's dietary intake may be affected by a preexisting health condition such as lactose intolerance, celiac sprue, or the inability to tolerate acidic foods (46). The variety of influences on dietary habits make personalized eating plans essential.

Successful nutrition interventions have included those that use peer educators, adequate numbers or lessons, a behavioral base, and developmentally appropriate strategies (92). Interventions that have behavioral focus tend to be more successful at behavior change, with the goal being to enhance health by reducing risk factors (92). These programs encourage slow, gradual weight loss through lifestyle changes in eating and physical activity (32). Most successful programs that promote long-term weight loss allow gradual weight loss to occur and encourage behavior changes for life (80-82).

Often the focus is on specific health behaviors such as consumption of fruits and vegetables, or decreasing the intake of fried or commercially prepared foods. It is also important to note that programs that focused on a combination of nutrition and physical activity were more successful than interventions focusing on dietary behaviors alone (92;93). Examples of some of the more successful dietary interventions include the *Traffic-Light Program* (94), which helped to develop an awareness of the level of hunger and information on food choices. The *Traffic-Light Program* suggests that green represents “go” for fruits and vegetables and foods that an individual should make up a large part of the diet. Yellow foods are “caution” and should be eaten in moderation and include foods like avocados and 2% milk. Red foods are high in fat and should be eaten on occasion. The red group includes sweets, whole milk and soft drinks. Other successful programs include the *Shape-down Program* (88) and the *5-a-day Program* (95). The *Shape-down Program* focuses on balancing intake of food with physical activity in order to promote healthy lifestyle changes and a gradual loss of weight. The *5-a-day program* focuses on eating a variety of fruits and vegetables throughout the day, most days of the week in order to promote a healthy lifestyle. While these programs have been somewhat successful, they are based on pre-designed curriculums that do not take into account the individual’s current situation and readiness to change.

### Stage of Change and Intervention Success

There are many tools that are available to explain the process of change that results in successful behavioral change (12;96;97). One such tool has been the Stage of



Change or Transtheoretical Model which was developed to better understand the process of making an intentional change in behavior (48). This behaviorally based model identifies an individual as being in one of five of the stages: precontemplation, contemplation, preparation, action or maintenance. In precontemplation, an individual may not even be aware of the potential risk factors associated with their actions. Contemplation is characterized by the individual being aware of the changes that need to be made in order to promote a healthier lifestyle. In the preparation stage an individual may have taken the first steps toward behavior change, while in the action stage an individual is relatively consistent in choosing the healthier behavior. By the time an individual reaches the maintenance stage the new behavior has replaced the previous behavior and behavior modification has been accomplished.

Along with each of the stages in the Transtheoretical Model there are different influential factors that support the behavior change process (48) (**Figure 1**). These processes of change provide the information needed to promote a behavior change and include: consciousness raising, self-reevaluation, self-liberation, counter-conditioning, stimulus control, reinforcement management, helping relationships, dramatic relief, environmental reevaluation, and social liberation (48). For instance, in the pre-contemplation stage, information about the behavior or consciousness raising is often the best approach to promote a behavior change. In contrast, in the maintenance stage, information on reinforcement management or a positive reward system increase the likelihood of behavior maintenance.

The Transtheoretical Model was first designed as a linear mode, where progress from one stage to the next was simple and failure was the exception rather than the rule

(48). However, trends to relapse proved to be the rule rather than the exception and so the model was revised to a spiral shape. The spiral shape implies that behavior change may be attempted several times before reaching the action or maintenance stage (48). For example, people who attempt to quit smoking often fail on their first try and then after a period of time try to quit smoking again. Although the individual may have a number of successes and relapses, eventually the concept is that they will meet their goal (48).

The stage of change format has been used successfully in adults. Steptoe and colleagues (54) found that interventions based on stage of change increased physical activity in participants compared to those receiving an intervention alone. Stages of change questionnaires have been developed for smoking cessation (54) and even for nutritional change in adults (53). Campbell and colleagues (51) found that using the stage of change model was applicable to determining fruit and vegetable consumption as well as indicating attitudes or readiness to change these behaviors in both adults. Van Der Veen and colleagues (49) found that patients at risk for cardiovascular disease had better success with implementing change in nutritional behavior when the counseling was based on stage of change than those subjects receiving counseling alone. Overall, utilization of the Transtheoretical Model appears to be an effective approach for health behavior modification in adult populations.

Few studies have utilized the Transtheoretical Model for health behavior modification in adolescents (49;50;55;98). Lee and colleagues (99) found that the staging framework was valid for measuring readiness for exercise behavior among adolescents. The findings of Fickner and Byrd-Bredbenner (52) support that nutrition interventions based on pre-action stage oriented change promoted a reduction in dietary fat intake.

Pallanon (98) found that adolescents in the pre-contemplation and contemplation stages were less likely to make successful changes in behavior. The author (98) suggests that intervention programs should be developed specifically for the pre-contemplation stage. Other studies (49;50;55) have supported these findings by indicating that adolescents in the pre-contemplation and contemplation stages were much more likely to make changes when interventions based on the stage of change were used. Even though there are a limited number of reports of intervention programs with adolescents based on the Transtheoretical Model, the available evidence supports the potential effectiveness of this model with the target population in the current study.

Figure 1. Processes of Change associated with the Transtheoretical Model

PRE-CONTEMPLATION	CONTEMPLATION	PREPARATION	ACTION	MAINTENANCE
Consciousness Raising	Consciousness Raising			
Social Liberation	Social Liberation	Social Liberation	Social Liberation	
Helping Relationships	Helping Relationships	Helping Relationships	Helping Relationships	Helping Relationships
	Dramatic Relief	Dramatic Relief		
	Self Reevaluation	Self Reevaluation		
		Self Liberalization		
			Reinforcement Management	Reinforcement Management
			Counter Conditioning	Counter Conditioning
			Environmental Reevaluation	Environmental Reevaluation

## CHAPTER THREE

### METHODS

This study was designed as part of the CYFAR program sponsored by the USDA. The purpose of the program was to provide education to at-risk children and their families through the OSU Cooperative Extension Services. This CYFAR project entitled, *Oklahoma New Communities Project*, focused on promoting healthy lifestyle behaviors in order to reduce the incidence of overweight youth in two Oklahoma counties with high numbers of low-income Native American families.

The purpose of this study was to begin to develop a Stage of Change Questionnaire that could be used to address the specific needs of the target population (i.e. seventh and eighth grade boys and girls) and to provide a means of monitoring change over time. First, a Health Behavior Questionnaire was developed and the stability assessed, to address the CYFAR program targeted health behaviors (i.e. nutrition, physical activity and food safety). Next, select questions from the Health Behaviors Questionnaire were modified into a stage of change format and evaluated using group interviews. All procedures in the study protocol were approved by the Oklahoma State University Institutional Review Board (Appendix A).

## Participants

For the purpose of developing a Stage of Change Questionnaire, the study participants (n=50), included English-speaking seventh and eighth graders living in the state of Oklahoma. Participants were recruited through school, extracurricular activities, and other community-sponsored events. The seventh and eighth graders were informed of the opportunity to participate in the study and then given a parental consent form (Appendix B) to take home to be signed by their parents. Upon return of the parental consent form the following day, the participants were asked to give affirmation of their willingness to participate in the study. An alternate activity was provided for the youth who did not wish to participate in the study.

The study was divided into two parts. Part I, consisted of fifty seventh and eighth graders who participated in the test-retest evaluation of the Health Behavior Questionnaire. Six participants were eliminated because they did not fully complete both the test and retest portions of the questionnaire. Part II of the study was aimed at evaluating the Stage of Change Questionnaire. Ten of the seventh and eighth graders who had completed the Health Behavior Questionnaire, approximately one month earlier were asked to complete the Stage of Change Questionnaire. Immediately following the completion of the Stage of Change Questionnaire, the group interviews were conducted.

## Health Behavior Questionnaire Development

First, questions related to nutrition, physical activity and food safety were reviewed from Hargreaves et al. (53) and Lee et al. (99) studies. The questions were modified so that they were at an age-appropriate reading level. Questions from these two

studies were chosen because they had been previously validated and used for determining Stage of Change in a study design similar to the current study. All questions were formatted so that a multiple-choice answer would indicate the frequency of the behavior. Although similar questionnaires for adults often ask about behavior over the previous six months, the cognitive ability of the target population in this study required the assessment of more recent behavior. Thus, the multiple-choice responses included: never, rarely (1-2 times a week), sometimes (4 times a week), often (once a day), usually (2-3 times a day), always (4 times a day).

Scores were assigned to each question as follows. Questions were reviewed and determined to be either a positive or negative health behavior. For example, those questions asking about fruit and vegetable consumption were considered positive health behaviors and those asking about soft drinks and candy consumption were considered negative health behaviors. Once the questions were determined as either a positive or negative health behavior a point system was assigned. Each set of possible answers was assigned a point value so that questions that were associated with a positive health behavior added to the participant's cumulative score while negative behavioral questions reduced the cumulative score. For an answer of never, no points were added or taken away. For an answer of rarely or sometimes a point was added for a positive health behavior, and one was removed for a negative health behavior. For an answer of sometimes or often, two points were added for positive health behaviors and two points were taken away for negative health behaviors. Finally for a response of always, three points were added for a positive behavior and three points were taken away for a negative

health behavior. These composite scores were then used to determine the behavior patterns of the subjects.

The test-retest format involved participants taking the Health Behavior Questionnaire an average 2 weeks apart. Participant recollection of answers from the first to second time the questionnaire is completed can be a problem associated with the test-retest method (100). To minimize the influence of recollection participants were asked to complete the questionnaire no less than 1 week and no more than 1 month apart. Study participants were not provided with information or education regarding nutrition, food safety, and physical activity behavior in the interim. Other tools used to minimize bias were to ask more than one questions about a specific behavior to look for consistency in answering. Additionally, participants were assured that their individual answers regarding health behavior were not being evaluated, but rather the questionnaire itself.

#### Stage of Change Questionnaire Development

Following evaluation of the Health Behavior Questionnaire, questions were selected from each of the major target areas and revised into a format that could assess the participant's stage of change (Appendix D). Three questions were taken from each of the topic areas (i.e. nutrition, physical activity, and food safety) and modified to assess not only the frequency of behavior (i.e. action stage), but also whether or not the participant "thought" about performing a certain health behavior. These questions were added in order to distinguish between pre-contemplation, contemplation, and preparation.



For example, in order to determine the readiness of the participant to begin changing behavior a behavior question asking, “How often do you choose pop, candy, and chips as snacks,” was followed by the question, “How often do you think about what foods you choose for a snack.” Such questions assessed the action stage followed by contemplation and preparation stage within the Stage of Change Model. Additionally, two separate questions were added to each of the three topic areas. One question was designed to assess previous attempts to change and the other to assess a future desire to change.

### Interviews

Interviews were held with a sub-sample of the participants (n=10) that completed both the Health Behavior Questionnaire and the Stage of Change Questionnaire. After completing the Stage of Change Questionnaire group interviews were conducted to determine their understanding of the questions, concerns regarding formatting, and questions related to the three target areas (See Appendix E for Interview Questions). Questions included whether or not the participants felt they understood the questions, as well as activities and foods that the participants felt should be included in future versions of the questionnaire.

The interviews were conducted by separating the participants into two groups (n=5) and seated in a semi-circle. Each participant was assigned a number to identify their responses to questions. Responses were recorded on each participant’s individual

form. Responses were not altered in any way and both group interviews were conducted by the same interviewer to ensure consistency.

After the completion of the group interviews, the notes were reviewed to assess the appropriateness of the content and format of the Stage of Change Questionnaire for this target population. Notes from the two interviews were collected and typewritten into transcripts. The transcripts were reviewed by three investigators with the OSU CYFAR project to determine common themes from the participants' responses. Following individual evaluation, the investigators then came to agreement on common themes from the data.

### Statistical Analysis

Test-retest data were analyzed using paired T-test using SAS (version 8.02; SAS Institute Inc., Cary, NC). Similar analyses have been previously used in test-retest designs (101);(102). Individual questions were first analyzed comparing the group means for the test to the group mean of the re-test for each question. Next, each of the three topic areas (i.e. nutrition, food safety and physical activity) was assessed using the same comparisons for all questions in a given topic area. Differences between the test-retest means were considered significant at a  $p < 0.05$ .

## CHAPTER FOUR

### RESULTS

The demographic characteristics of the study population completing Part I- the Health Behavior Questionnaire and Part II- the Stage of Change Questionnaire are presented in **Table 1** and **Table 2**, respectively. The study population for Part I and Part II was approximately 60% girls (n=25), and 40% boys (n=19). Participants in Part I and Part II of the study had a mean age of 13 years and their age ranged from 12 to 15 years. No significant difference was found between the age and gender of participants completing the Health Behavior Questionnaire and those completing the Stage of Change Questionnaire (data not shown).

Stability testing using paired T-tests revealed no significant differences between the test and retest responses when all scores in each of the topic areas were combined. Data for questions related to nutrition, physical activity, and food safety are presented in **Tables 3-5**, respectively. Assessment of the stability of individual questions revealed a significant difference in test-retest responses related to one physical activity question (the use of stairs instead of elevators and escalators—question #18) and two food safety questions (rinsing fruits and vegetables—question #28, and determining the sizes of snacks—questions #30). There was also a tendency for the test-retest responses to vary on two questions related to nutrition (question #4  $p=0.0768$ ; question #8  $p=0.0832$ ). These nutrition questions pertained to eating a baked potato versus french fries or potato

chips and the consumption of fruit, juice, crackers and peanut butter for snacks. All other questions were found to be stable in this study population.

### Qualitative Results from Interviews

Compilation of the results from the group interviews revealed that there were three emerging themes related to the Stage of Change Questionnaire. First, the participants indicated basic understanding of the questions. All participants agreed that they understood the questions, which supports the appropriateness of the questionnaire for a seventh and/or eighth graders level of comprehension. The second theme that emerged from the interviews was related to the issue of some questions seeming repetitious. Several of the participants indicated that “questions repeated” or that there seemed to be a lot of repetition. The most likely reason for this sense of repetition was the health behavior questions (i.e. action stage questions) were immediately followed by “contemplation questions” associated with the same health behavior. However, no data are currently available to support this argument. The third and final theme that emerged from the interviews was that there were topics the participants felt were important and should be included in future versions of the Stage of Change Questionnaire. A variety of suggestions were made, however, the most common issues related were the need for questions related to “meat” and “vitamin” intake. Participants also mentioned a number of physical activities they believed should be included such as “volleyball,” “basketball,” “track,” and “tae kwon do”.

Taken together, these three emerging themes indicate that the questions in the Stage of Change Questionnaire were appropriate for seventh and eighth graders in terms

of comprehension. Perhaps specific instructions are warranted when using a questionnaire based on stage of change with this age group. Such instructions or guidelines could assist the adolescent in distinguishing between a question related to the frequency of a health behavior and one that focuses on whether the individual has considered such a health behavior. Furthermore, as modifications are made to the questionnaire, the suggestions related to meat intake and supplement use should be considered.

**Table 1.** Demographic data of participants completing the Health Behavior Questionnaire

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CHARACTERISTICS	VALUE
N	44
FEMALE	57% (n = 25)
MALE	43% (n = 19)
AGE (yrs)	13 ± 0.904
AGE RANGE (yrs)	12-15
MEDIAN AGE (yrs)	13

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**Table 2.** Demographic data of participants completing the Stage of Change Questionnaire

CHARACTERISTICS	VALUE
N	10
FEMALE	60% (n = 6)
MALE	40% (n = 4)
AGE (yrs)	13.3 + 1.1
AGE RANGE (yrs)	12 – 15
MEDIAN AGE (yrs)	13

**Table 3.** Comparisons of test–retest responses for all nutrition questions combined in the Health Behavior Questionnaire and comparisons of responses by individual question.

TOPIC AREA	TEST	RETEST	P-value
Nutrition	12.5682 ± 3.995	12.9545 ± 4.2369	0.4493

QUESTION	TEST	RETEST	P-value
1 - Fruit Juice	2.5000 ± 0.8491	2.6364 ± 0.7803	0.2044
2 - Whole Fruit	2.3409 ± 0.6801	2.3864 ± 0.7538	0.4858
3 - Green Vegetables	2.4091 ± 0.7256	2.4545 ± 0.6631	0.6226
4 - Baked Potato	2.0227 ± 0.7310	2.2500 ± 0.8387	0.0768
5 - Vegetables	2.2955 ± 0.6675	2.4318 ± 0.6611	0.1597
6 - Milk	2.8864 ± 0.8948	2.8864 ± 0.7840	1.0000
7 - Dairy	2.5909 ± 0.6220	2.6364 ± 0.8378	0.6996
8 - Snack Choices	2.4318 ± 0.6954	2.6364 ± 0.7182	0.0832
9 - Junk Food	2.7727 ± 0.8030	2.7727 ± 0.8589	1.0000
10 - Fried Foods	2.4545 ± 0.7299	2.5227 ± 0.7621	0.5189
11 - Low-Fat Foods	2.4318 ± 0.6954	2.4318 ± 0.6954	0.5189

Data represent means ± standard deviation.



**Table 4.** Comparisons of test–retest responses for all physical activity questions combined in the Health Behavior Questionnaire and comparisons of responses by individual question.

<b>TOPIC AREA</b>	<b>TEST</b>	<b>RETEST</b>	<b>P-value</b>
Physical Activity	8.2727 $\pm$ 3.7871	7.7955 $\pm$ 3.1812	0.2426
<b>QUESTION</b>	<b>TEST</b>	<b>RETEST</b>	<b>P-value</b>
12 - Vigorous Act	3.0909 $\pm$ 0.8016	3.0455 $\pm$ 0.7138	0.6880
13 - Moderate Act	2.5227 $\pm$ 0.8029	2.5681 $\pm$ 0.8183	0.7890
14 – Calisthenics	2.7954 $\pm$ 0.7947	2.7500 $\pm$ 0.8387	0.5987
15 - Stretching	2.7500 $\pm$ 0.7913	2.8182 $\pm$ 0.7857	0.5378
16 – Television	3.0227 $\pm$ 0.8209	3.0227 $\pm$ 0.7621	1.0000
17 - Video Games	2.5454 $\pm$ 0.8478	2.5227 $\pm$ 0.7309	0.8441
18 – Stairs	3.0000 $\pm$ 1.0996	2.5681 $\pm$ 1.1693	0.0378*
19 - Walking	2.1818 $\pm$ 0.8428	2.1590 $\pm$ 0.8337	0.8376
20 - Group Activities	2.5455 $\pm$ 0.8748	2.5682 $\pm$ 0.8463	0.8441

Data represent means  $\pm$  standard deviation. \*Indicates statistical significance at  $p < 0.05$ .

**Table 5.** Comparisons of test–retest responses for all food safety questions combined in the Health Behavior Questionnaire and comparisons of responses by individual question.

TOPIC AREA	TEST	RETEST	P-value
Food Safety	13.8409 ± 3.5236	13.9773 ± 3.0154	0.7333

QUESTION	TEST	RETEST	P-value
21 - Diet Choices	1.5455 ± 0.7911	1.6136 ± 0.7804	0.5378
22 - Washing hands	3.2500 ± 0.9432	3.2272 ± 0.9612	0.8761
23 - Washing hands	3.3182 ± 0.8289	3.2045 ± 0.7649	0.2803
24 - Washing hands	3.0455 ± 0.9872	2.9318 ± 0.8463	0.3025
25 - Reheating foods	2.8182 ± 0.8148	2.7727 ± 0.8856	0.6427
26 - Leftovers	2.3864 ± 0.8413	2.5227 ± 0.9019	0.4166
27 - Reheating foods	3.2955 ± 0.9042	3.3182 ± 0.8832	0.8216
28 - Rinsing foods	2.5909 ± 1.0851	2.3182 ± 1.1159	0.0441*
29 - Raw foods	2.7500 ± 1.0593	2.7727 ± 0.9851	0.8301
30 - Serving size	1.8182 ± 1.0625	2.0909 ± 1.1375	0.0168*
31 - Sharing utensils	1.4545 ± 0.7611	1.7045 ± 0.9296	0.0937

Data represent means ± standard deviation. \*Indicates statistical significance at p<0.05.

## CHAPTER FIVE

### DISCUSSION

This study involved the initial development of a Stage of Change Questionnaire to assess behavior change related to nutrition, physical activity, and food safety in seventh and eighth graders. Previously, the Transtheoretical Model has been used effectively with adults (49), but few studies have been published utilizing this model for health behavior change in youth. Walton and colleagues (103) reported using the Transtheoretical Model in an exercise program with a population as young as 5<sup>th</sup> and 6<sup>th</sup> graders. They determined that interventions targeted at specific stages of change could enable a child to move along the continuum towards a more active lifestyle (103). Recently, Frenn and co-workers (104) employed a combination of the Health Promotion and Transtheoretical Models to reduce middle school students' intake of dietary fat. The authors indicated that although their data were cross-sectional and could not imply causality, they found that students in the Stage of Change intervention group had a greater reduction in fat intake and increased duration of physical activity. While these studies (103;104) have effectively utilized Stage of Change in programs related to health behavior modification in adolescents, the instrument designed in this study was the first to focus on the combination of nutrition, physical activity and food safety behaviors.

In order to determine the current health practices related to nutrition, physical activity and food safety a Health Behavior Questionnaire was developed. The development of a set of age- and topic-appropriate questions for seventh and eighth graders was important due to the critical importance of balancing nutritional intake and physical activity with regard to prevention in overweight youth (2;20;44) and long-term weight management (44;80). Assessment of the stability of the questionnaire revealed that it was a relatively stable instrument, although two of the food safety questions and one of the physical activity questions may require further modification.

The two food safety questions that were not stable in the test-retest design (i.e. “rinsing” fruits and vegetables, and the determination of the “serving size of chips, pretzels, or snack cake”), may have been a result of the phrasing and formatting of the questions. For instance, more adolescents may have identified with the term “washing” fruits and vegetables rather than “rinsing”. Furthermore, the format of the choices or options on the question related to determination of a serving size of a snack may have been problematic. Options such as “I choose the smallest bag” and “I eat until I am not hungry” may have been confusing when most questions on the instrument had choices based on frequency (e.g. never, rarely, sometimes or always). Future revisions of the Health Behavior Questionnaire should take these factors into account.

In addition to a lack of stability with the two aforementioned food safety questions, one physical activity question related to the use of escalators and elevators was also found to be unstable. This question will likely be omitted in the revised Health Behavior Questionnaire. The two communities targeted in the OSU CYFAR program are both rural low income communities. There are no known multi-level buildings in either

of these communities making the choice of stairs over an escalator or elevator an unlikely contributor to daily physical activity.

The Stage of Change Questionnaire was based on a similar format used in two previous studies by Hargreaves et al. (53) and Lee et al. (99). This format involved asking current health behavior questions as well as questions addressing the intent to change. Other studies (50;54;55) have utilized a similar format. For example, a questionnaire to assess the Stage of Change in adults often asks questions about current behaviors, attempts at behavior changes within the past six months, and intent to make a behavior change within the next six months. Due to the age of the target population questions in the present study, referring to the intention to change behavior in the next six months or the attempted behavior change within the past six months was not a realistic expectation. The timeframe was reduced due to adolescent's more limited ability to recall. The qualitative data suggest that this format for some adolescents was somewhat confusing based on the perception that they were answering the same question more than once. Inclusion of pre-assessment instructions that explain the difference in behavior frequency (i.e. action) and "considering or think" about a behavior change (i.e. contemplation) may help to alleviate this concern.

Another consideration during adolescents is individuals are developing a sense of identity and independence (56). While this process occurs throughout the life-cycle, adolescence is characterized by a substantial reorganization and restructuring of the individuals sense of self (56). For the first times individuals have the ability to understand and appreciate the significance of behavioral changes. As a result, adolescents are more self-conscious of changes than they previously were in childhood. During this time,

adolescents are also better able to understand the long-term effects of their behavior and thus able to determine the consequences of choosing one behavior over another (56). Steinberg (56) also indicates that adolescents are able to determine a person's perspective. For example, individuals are beginning to be able to determine if the person providing information has expertise in the area or biases towards one choice over another. Cognitively, the development of behavior and the ability to modify a behavior becomes. These same concepts are also important in order to be able to recollect changes in behavior, or previous and future attempts/plans to change behavior. Thus adolescence is likely one of the earliest developmental stages at which a stage of change can be utilized.

Using tailored messages based on the Transtheoretical Model has been shown to enhance both short-term and long-term behavior change (49;52). While these findings support the use of this model in behavior in the "action" stage, stage-specific interventions have also been shown to provide additional support for those participants in the "pre-action" stages (i.e. precontemplation, contemplation, and preparation) (52;103). Additionally, the maintenance of behavior change is further improved when the intervention is family-based (49), provides both general and specific information (50), and involves peers (92;93). The Transtheoretical model provides a conceptual framework that seems to work effectively during youth. Further research is needed to determine the effects of an adolescent's cognitive development of independence and identity during this time in order to improve the effectiveness of interventions based on Stage of Change.

## CHAPTER SIX

### CONCLUSION

The increase in the incidence of overweight among American youth over the past two decades has highlighted the need for better weight management interventions (2;105). This seems to be especially true of youth in low income, minority groups, which have experienced some of the greatest increases in the prevalence of overweight (5;91). This study targeted health behaviors related to weight management (i.e. nutrition, physical activity and food safety) and was designed to begin to develop a Stage of Change Questionnaire that could be used with youth,. The two-part study was set up to: 1) develop and test the stability of a Health Behavior Questionnaire; and 2) revise select questions from the Health Behavior Questionnaire into a Stage of Change format.

The data indicate that Hypothesis 1, which stated there will be no difference in the test and retest means for the Health Behavior Questionnaire, was not rejected. Although there were significant differences in the test-retest means of two food safety and one physical activity questions (i.e. question #18, #28 and #30), no other differences were observed. As previously discussed, the question related to snack portion size (i.e. question #30) may have been problematic because of the coding scheme for the responses. The question asking about rinsing of fruits and vegetables (question #28) may simply need to be reworded to be appropriate for used within this population.

Interviews following completion of the Stage of Change Questionnaire indicated that the participants understood the questions. Issues related to the perceived repetitiveness of Stage of Change questions need to be addressed with this particular age group. Pre-evaluation instructions may provide a means of addressing this concern. Additional questions will be considered in the next revision of the Stage of Change Questionnaire related to the consumption of meat as well as vitamin and mineral supplements. Based on these findings, Hypothesis 2, which indicated that the interviews will provide qualitative information regarding the appropriateness of the Stage of Change Questionnaire and determine the questions that require further modification, was not rejected.

### Implications

As a result of this study, the Health Behavior Questionnaire was determined to be relatively stable to evaluate the target behavior areas of the *Oklahoma New communities CYFAR project*. Despite the overall stability, some minor modifications are needed. This project demonstrated that a questionnaire based on the Transtheoretical Model could be understood by seventh and eighth grade students. The focus group provided valuable insight into the Stage of Change Questionnaire. Participants reported adequate comprehension of the questions, but some alterations in the questionnaire format may be beneficial.



## Recommendations

Future studies are needed to revise the questions on the Health Behavior Questionnaire found to be unstable in this study so that reliability and validity be performed. The Stage of Change Questionnaire should be modified so that evaluation instructions are available to assist participants with differentiation questions and “thinking or contemplation” questions. Furthermore, evaluation of a revised Stage of Change Questionnaire in a population that more closely resembles the actual CYFAR project target audience is warranted.

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APPENDIX A

Oklahoma State University  
Institutional Review Board

Protocol Expires: 12/2/2003

Date: Tuesday, December 03, 2002

IRB Application No HE0317

Proposal Title: DEVELOPMENT AND VALIDATION OF AN OKLAHOMA COOPERATIVE EXTENSION  
SERVICE SURVEY DESIGNED TO ASSESS CHILDREN'S HEALTH BEHAVIORS

Principal  
investigator(s):

Lisa Tauer  
2728 S. 116th Ave  
Tulsa, OK 74129

Brenda Smith  
423 HES  
Stillwater, OK 74078

Reviewed and  
Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

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Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. 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.

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 projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact Sharon Bacher, the Executive Secretary to the IRB, in 415 Whitehurst (phone: 405-744-5700, sbacher@okstate.edu).

Sincerely,



Carol Olson, Chair  
Institutional Review Board

Oklahoma State University  
Institutional Review Board

Protocol Expires: 12/2/2003

Date : Thursday, September 04, 2003

IRB Application No HE0317

Proposal Title: DEVELOPMENT AND VALIDATION OF AN OKLAHOMA COOPERATIVE EXTENSION  
SERVICE SURVEY DESIGNED TO ASSESS CHILDREN'S HEALTH BEHAVIORS

Principal  
Investigator(s) :

✓  
Lisa Tauer  
2728 S. 116th Ave  
Tulsa, OK 74129

Brenda Smith  
416 HES  
Stillwater, OK 74078

Reviewed and  
Processed as: Exempt

Approval Status Recommended by Reviewer(s) : Approved

**Modification**

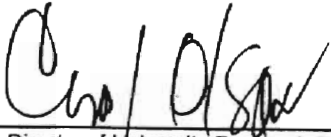
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Please note that the protocol expires on the following date which is one year from the date of the approval of the original protocol:

**Protocol Expires: 12/2/2003**

This approval is to expand the population pool, but not the size of sample.

Signature :



\_\_\_\_\_  
Carol Olson, Director of University Research Compliance

Thursday, September 04, 2003  
\_\_\_\_\_  
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX B

Dear Parent,

The Oklahoma Cooperative Extension Service has developed a questionnaire to evaluate Oklahoma Cooperative Extension Service youth programs related to physical activity, nutrition, food selection and food safety. In order to evaluate the questionnaire reliability we would like your permission for your child to complete the questionnaire on two separate occasions. The purpose of this is to evaluate the questionnaire reliability, not to evaluate your child's personal physical activity, nutrition, food selection or food safety behaviors. Your child's participation is voluntary and an alternative activity will be provided for those who do not volunteer to participate in evaluating the questionnaire reliability.

Your child's name will be on the questionnaire only for purposes of matching the two questionnaires. I will match the two questionnaires by name, staple the questionnaires together and then remove the names from the questionnaires. The stapled questionnaires without any personal identification will then be sent to the Oklahoma Cooperative Extension Service Nutrition Education Specialist.

If you agree to let your child to participate please sign the following consent form. Please note that your child will be asked to participate only if they choose to do so.

Sincerely,

Janice Hermann  
OCES Nutrition Specialist

I, \_\_\_\_\_ hereby authorize my child \_\_\_\_\_  
to participate in the Oklahoma Cooperative Extension Service survey involving questions  
with regard to food safety, self-esteem, food preparation, and nutrition.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_



Name: \_\_\_\_\_

The Oklahoma Cooperative Extension Service would like your help in evaluating a questionnaire developed to evaluate Oklahoma Cooperative Extension Service youth programs related to physical activity, nutrition, food selection and food safety.

In order to evaluate the questionnaire we would like you to complete the questionnaire on two separate occasions. The purpose is to evaluate the questionnaire, not your personal behaviors.

There are no right or wrong answers. Please mark the answer that best describes your current behavior.

Your name is on a separate page only for purpose of matching the two questionnaires. I or your physical education teacher will match the two questionnaires by name, staple the two questionnaires together and then remove the names from the questionnaires.

Thank you in advance for your time and help.



Age \_\_\_\_\_

Gender \_\_\_\_\_

### Sample Physical Activity, Nutrition, Food Selection and Food Safety Questions

1. How often do you drink 100% fruit juices such as apple, orange, or grape juice (not counting kool-aid or punch)?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
2. How often do you eat whole fruit such as apples, bananas, peaches, strawberries, and oranges?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
3. How often do you eat green vegetables such as green beans, broccoli, peas or spinach?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
4. How often do you eat a baked potato not including French fries, or potato chips?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)

5. How often do eat other vegetables such as squash, corn, carrots, tomatoes or cabbage?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
6. How often do you drink milk?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
7. How often do you eat cheese, yogurt, or cottage cheese?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
8. How often do you choose fruit, juice, crackers, and peanut butter for snacks?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
9. How often do you choose pop, candy and chips for snacks?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)

10. How often do you choose foods high in fat such as fry bread, butter, ice cream and fried foods?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
11. How often do you choose low-fat foods (fruit, juice and vegetables) over high-fat foods (fry bread or chips)?
  - a. Never
  - b. Rarely
  - c. Sometimes
  - d. Often
  - e. Usually
  - f. Always
  
12. How often do you do activities that make you sweat and breathe hard such as running, swimming laps, bicycling, dancing or lacrosse?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
13. How often do you do activities that do not make you sweat or breathe hard such as fast walking, mopping, or gardening but not including watching T.V.?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
14. How often do you do activities that build your muscles such as push-ups, sit-ups or weight lifting?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)

15. How often do you stretch your muscles such as touching your toes?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
16. How often do you watch T.V.?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
17. How often do you play video games, or watch movies?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
18. How often do you take the stairs instead of riding the escalator or elevator?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
19. How often do you walk somewhere instead of having someone drive you?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)

15. How often do you stretch your muscles such as touching your toes?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
16. How often do you watch T.V.?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
17. How often do you play video games, or watch movies?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
18. How often do you take the stairs instead of riding the escalator or elevator?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
19. How often do you walk somewhere instead of having someone drive you?
- a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)

20. How often are you active in other ways such as going to the park, going to the mall, or playing in the pool?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
21. Have you ever chosen to diet, exercise or use pills to change your weight?
- Never
  - Rarely
  - Sometimes
  - Often
  - Usually
  - Always
22. How often do you wash your hands before eating a meal?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
23. How often do you wash your hands before eating a snack?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)

24. How often do you wash your hands after you touch your face, hair or sneeze when you are cooking or eating?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
25. How often do you reheat leftover foods such as stew, soup, macaroni and cheese, meat or pizza until they are steamy hot?
- Once
  - Twice
  - Three or more times
  - I don't keep track
  - Never
26. How often do you put leftovers into the refrigerator within two hours of cooking or buying them?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
27. How often do you reheat the same food?
- Once
  - Twice
  - Three or more times
  - I don't keep track
  - Never

28. Do you rinse off fresh fruits and vegetables before you cut and eat them?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
29. Do you separate your raw foods from your cooked foods?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
30. When you are going to get a snack of chips, pretzels, or snack cake, how do you determine a serving size?
- I choose the smallest bag
  - I choose the middle size bag
  - I choose the largest bag
  - I look at the label on the back to decide how much I eat (or buy)
  - I eat until I am not hungry
  - I choose the amount I can afford to buy
31. Do you share plates, utensils, cups or straws with others before they are washed?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)



APPENDIX D

Name: \_\_\_\_\_

The Oklahoma Cooperative Extension Service would like your help in evaluating a questionnaire developed to evaluate Oklahoma Cooperative Extension Service youth programs related to physical activity, nutrition, food selection and food safety.

In order to evaluate the questionnaire we would like you to complete the questionnaire on two separate occasions. The purpose is to evaluate the questionnaire, not your personal behaviors.

There are no right or wrong answers. Please mark the answer that best describes your current behavior.

Your name is on a separate page only for purpose of matching the two questionnaires. The 4-H Youth Development Educator will match the two questionnaires by name, staple the two questionnaires together and then remove the names from the questionnaires.

Thank you in advance for your time and help.

Age \_\_\_\_\_

Gender \_\_\_\_\_

### Sample Physical Activity, Nutrition, Food Selection and Food Safety Questions

1. How often do you choose fruit, juice, crackers, and peanut butter for snacks?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
2. How often do you think about eating fruits and vegetables instead of ready made foods such as chips and candy?
  - a. Never
  - b. Rarely (once a week)
  - c. Sometimes (2-3 times a week)
  - d. Often (most days of the week)
  - e. Usually (once a day)
  - f. Always (2 or more a day)
  
3. How often do you choose pop, candy and chips for snacks?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
4. How often do you think about eating how much fat you are eating?
  - a. Never
  - b. Rarely (once a week)
  - c. Sometimes (2-3 times a week)
  - d. Often (most days of the week)
  - e. Usually (once a day)
  - f. Always (2 or more a day)

5. How often do you drink milk?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)
  
6. How often do you think about the amount of milk you drink?
  - a. Never
  - b. Rarely (once a week)
  - c. Sometimes (2-3 times a week)
  - d. Often (most days of the week)
  - e. Usually (once a day)
  - f. Always (2 or more a day)
  
7. In the past month have you tried to change what types of foods you eat?
  - a. Yes
  - b. No
  
8. In the next month are you planning on changing the types of foods you eat?
  - a. Yes
  - b. No
  
9. How often do you do activities that make you sweat and breathe hard such as running, swimming laps, bicycling, dancing or lacrosse?
  - a. Never
  - b. Rarely (once a week)
  - c. Sometimes (2-3 times a week)
  - d. Often (most days of the week)
  - e. Usually (once a day)
  - f. Always (2 or more a day)
  
10. How often do you think about doing activities that make you sweat and breathe hard such as running, swimming laps, bicycling, dancing or lacrosse?
  - a. Never
  - b. Rarely (a few times a week)
  - c. Sometimes (four times a week)
  - d. Often (1 a day)
  - e. Usually (2 a day)
  - f. Always (2 or more a day)

11. How often do you do activities that build your muscles such as push-ups, sit-ups or weight lifting?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
12. How often do you think about doing activities that build your muscles such as push-ups, sit-ups or weight lifting?
- Never
  - Rarely (once a week)
  - Sometimes (2-3 times a week)
  - Often (most days of the week)
  - Usually (once a day)
  - Always (2 or more a day)
13. How often do you stretch your muscles, such as touching your toes?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
14. How often do you think about stretching your muscles such as touching your toes?
- Never
  - Rarely (once a week)
  - Sometimes (2-3 times a week)
  - Often (most days of the week)
  - Usually (once a day)
  - Always (2 or more a day)
15. In the past month have you tried to change the amount of physical activity you do?
- Yes
  - No
16. In the next month are you planning to change the amount of physical activity you do?
- Yes
  - No

17. How often do you wash your hands before eating a meal or snack?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
18. Do you rinse off fresh fruits and vegetables before you eat or cut them?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
19. How often do you think about washing fruits and vegetables before you eat them?
- Never
  - Rarely (once a week)
  - Sometimes (2-3 times a week)
  - Often (most days of the week)
  - Usually (once a day)
  - Always (2 or more a day)
20. When you are going to get a snack of chips or pretzels, how do you determine which size to get?
- Never
  - Rarely (a few times a week)
  - Sometimes (four times a week)
  - Often (1 a day)
  - Usually (2 a day)
  - Always (2 or more a day)
21. How often do you think about the amount of food you buy or eat?
- Never
  - Rarely (once a week)
  - Sometimes (2-3 times a week)
  - Often (most days of the week)
  - Usually (once a day)
  - Always (2 or more a day)

22. In the past month have you tried to change the way you prepare food?

- a. Yes
- b. No

23. In the next month are you planning on changing the way you prepare food?

- a. Yes
- b. No

APPENDIX E



## INTERVIEW QUESTIONS

1. Did you find any questions confusing in the questionnaire?
2. What specific questions were confusing?
3. Did you understand the questions?
4. Did you understand your options for answers to the questions?
5. Were there questions that weren't asked that you thought were important?
6. Are there physical activities or sports that you participate in that were not asked about in this questionnaire?
7. Were there foods that you commonly eat that were not mentioned in the questionnaire?

VITA

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Lisa Ann Cherry

Candidate for the Degree of

Master of Science

**Thesis: TESTING THE STABILITY OF A HEALTH BEHAVIOR  
QUESTIONNAIRE IN SEVENTH AND EIGHTH GRADE STUDENTS**

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