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EXAMINING THE IMPACT OF PARTICIPATING IN A NUTRITION-EDUCATION AND  
CULINARY SKILLS-BUILDING PROGRAM ON INTRINSIC MOTIVATION TO PREPARE  
HEALTHY FOODS AND DIET QUALITY IN HIGH SCHOOL ADOLESCENTS

A Dissertation

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

in

The Department of Nutrition and Food Sciences

by  
Derek Charles Miketinas  
B.S., Louisiana State University, 2013  
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## ABBREVIATIONS

AMCQ	Adolescent Motivation to Cook Questionnaire
BMI	Body Mass Index
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
DGA	Dietary Guidelines for Americans
EFA	Exploratory Factor Analysis
EFNEP	Expanded Food and Nutrition Education Program
KMO	Kaiser-Meyer-Olkin
IM	Intrinsic Motivation
PC	Perceived Competence
RMSEA	Root-Mean-Square Error of Approximation
SCT	Social Cognitive Theory
SDT	Self-Determination Theory
SRMR	Standardized Root-Mean-Square Residual
TLI	Tucker-Lewis Index

## ABSTRACT

The objective of these studies was to develop a questionnaire that could measure the psychosocial constructs identified by the Self Determination Theory (SDT) as they relate to adolescents' food preparation attitudes and their learning environment. The questionnaire included items that measured intrinsic motivation (IM), perceived competence (PC), relatedness, autonomy, and autonomy support. These studies explored the questionnaire's validity, reliability, and ability to measure construct changes.

The Adolescent Motivation to Cook Questionnaire (AMCQ) was developed in the first study to measure high school students' IM and PC to prepare healthy foods, and their relatedness, autonomy and autonomy support within the classroom. High school students ( $n = 788$ ) were recruited to complete the questionnaire. After non-respondents were removed, responses from 245 students were analyzed using exploratory factor analysis, which returned a five-factor model ( $R^2 = 65.3\%$ ). A confirmatory factor analysis was performed on the remaining 315 responses. There was evidence that the five-factor model demonstrated a better fit ( $\chi^2 = 524.97$ ; Root Mean Squared Error of Approximation (RMSEA) = 0.056; Comparative Fit Index (CFI) = 0.93, Tucker-Lewis Index (TLI) = 0.92 Standardized Root-Mean-Square Residual (SRMSR) = 0.04) compared to a single-factor model ( $\chi^2 = 2253.58$ ; RMSEA = 0.151; CFI = 0.49, TLI = 0.44 SRMR = 0.18). Cronbach's alpha coefficients were calculated for each factor: IM:  $\alpha = 0.94$ ; PC:  $\alpha = 0.92$ ; autonomy support:  $\alpha = 0.94$ ; relatedness:  $\alpha = 0.90$ ; and autonomy:  $\alpha = 0.85$ .

The AMCQ's internal consistency, IM's test-retest reliability, and the instrument's ability to measure changes in adolescents' IM and PC as a result of participation in a culinary skills-building program were examined in the second study. The AMCQ was administered to high-



school students on two occasions two weeks apart for the test-retest analysis of IM. The nutrition education and culinary skills-building program was offered to high-school students as a school-based or summer program. Intrinsic motivation demonstrated test-retest reliability ( $r = 0.81$ ). After the program, students reported significant changes from baseline for IM ( $p < 0.0001$ ) and PC ( $p < 0.001$ ). Further investigation of the AMCQ needs to be conducted to determine its associations with dietary behavior outcomes.

## **CHAPTER 1 INTRODUCTION**

Youth who lack sufficient food preparation skills, have misconceptions about food group recommendations, and do not appreciate the health benefits of a healthy diet may consume poor quality diets and be at risk for becoming overweight or obese (Larson, Perry, Story, & Neumark-Sztainer, 2006a; Lichtenstein & Ludwig, 2010). Those who lack food preparation skills are more likely to depend on fast food and convenience foods, which tend to be high in sodium, saturated fatty acids, and added sugars, and low in essential nutrients and food groups (Powell & Nguyen, 2013; Poti, Duffey, & Popkin, 2014). The most recent estimates indicate that 31.8% of adolescents 12-19 years of age are classified as overweight or obese (Ogden, Carroll, Kit, & Flegal, 2014). Adolescents who are overweight or obese are more likely to be overweight or obese as adults (Singh, Mulder, Twisk, van Mecheln & Chinapaw, 2008). This places a severe burden on the medical system; healthcare costs associated with obesity in adults are as high as \$209.7 billion or 20.6% of U.S. health expenditures (Cawley & Meyerhoefer, 2012). To combat this public health problem, the Academy of Nutrition and Dietetics, the Centers for Disease Control and Prevention, and the National Academy of Medicine support the implementation of school-based interventions that focus on improving dietary intake (Hoelscher, Kirk, Ritchie & Cunningham-Sabo, 2013; Centers for Disease Control and Prevention, 2011; Institute of Medicine, 2005).

Adolescents are at a unique stage of development as they transition between childhood and adulthood (Alberga, Sigal, Goldfield, Prud'Homme, & Kenny, 2012). They develop a sense of autonomy, learn necessary skills for adulthood, cultivate relationships with peers and adults, and begin to make their own decisions (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008). Habits that form during this time can be difficult to change and are likely adopted as

adults (Singh et al., 2008; Nelson, et al., 2008; Laska, Larson, Neumark-Sztainer, & Story 2012). Behavioral change theories like the Self Determination Theory (SDT) can be used to develop successful intervention strategies to improve health behaviors (Schosler, de Boer, Boersema, 2014; Shaikh, Vinokur, Yaroch, Williams, & Resnicow, 2011; McSpadden et al., 2014).

The SDT explores the nature of human motivation and the three psychological needs necessary for its cultivation: relatedness, competence, and autonomy. The theory postulates that when these needs are met, motivation to perform a behavior is sustained (Deci & Ryan, 1985; Ryan & Deci, 2000). Interventions based upon the SDT have shown promise in influencing healthy eating habits and weight loss (Teixeira et al., 2006; Palmeira et al., 2007, Shaikh et al., 2011; McSpadden et al., 2014). Currently, there are no known studies that have utilized the SDT as a behavioral model for nutrition education and culinary skills-building programs.

### **Justification**

Nutrition education and culinary skills-building intervention programs guided by behavioral change theories have the potential to improve adolescents' dietary behaviors. However, there is no consistent theory used across programs; likewise, programs use varying evaluation instruments, which make it difficult to compare their effectiveness. A promising behavioral change theory for this setting is the SDT; however, there are no studies that have examined its applicability in this setting, or instruments to measure its constructs.

### **Objectives**

1. Develop a questionnaire to measure adolescents' sense of autonomy, autonomy support, and relatedness within the classroom setting and perceived competence and intrinsic motivation to prepare healthy foods.

2. Determine the construct validity of the questionnaire by performing exploratory and confirmatory factor analyses.
3. Test for internal consistency and reliability of the questionnaire.
4. Evaluate the changes in adolescents' intrinsic motivation and perceived competence to prepare healthy foods as a result of participating in a nutrition education and culinary skills-building program.
5. Measure the relationships between adolescents' sense of autonomy, autonomy support, perceived competence, and relatedness with their intrinsic motivation to prepare healthy foods.

## **Hypotheses**

### Study 1: Determine construct validity of the AMCQ

1. The exploratory factor analysis will return a 5-factor model that consists of the five SDT constructs.
2. The confirmatory factor analysis will provide evidence for acceptable model fit for the 5-factor model compared to a single-factor model.
3. The factors will demonstrate acceptable ( $\alpha > 0.70$ ) internal consistency.

### Study 2: Test the reliability of the AMCQ and measure the impact of a nutrition education and culinary skills-building program

1. The factors will demonstrate acceptable ( $\alpha > 0.70$ ) internal consistency.
2. Intrinsic motivation will demonstrate good test-retest reliability ( $r > 0.80$ ).
3. Students will report increases in intrinsic motivation and perceived competence to prepare healthy foods as a result of participating in a nutrition education and culinary skills-building program.

4. Intrinsic motivation to prepare healthy foods will be positively associated with perceived competence, relatedness, and autonomy.

### **Limitations**

1. All samples were convenience samples and could not be generalized to larger populations.
2. These studies underrepresented certain racial and ethnic groups.
3. All measures were self-reported, which relied on the participants' honesty.
4. The nutrition education and culinary skills-building program lacked a control group.
5. Dietary intake, food safety practices, and nutrition education instruments were limited in their frames of reference.

## **CHAPTER 2 REVIEW OF LITERATURE**

### **Overweight and Obesity**

The United States has seen a four-fold increase in adolescent obesity rates from 4.6% in 1963-1965 to 20.6% in 2013-2014 (Fryar, Carroll, & Ogden 2014; Ogden et al., 2016). Left unabated, adolescents are likely to carry their weight status into adulthood (Singh et al., 2008). In response to this growing problem, the American Medical Association House of Delegates has recognized obesity as a disease (2013), and other professional organizations have made obesity a top public-health priority (Krebs, Jacobson, & American Academy of Pediatrics Committee on Nutrition, 2003; Koplan, Liverman, & Kraak, 2005).

Body Mass Index (BMI) is a proxy measure of adiposity and is defined as the ratio of an individual's weight in kilograms to their square height in meters. Childhood and adolescence encompasses a range of growth and maturation which makes raw BMI values alone inadequate for assessing weight status (Kuczmarski et al., 2002). Rather, BMI for youth need to be to the Centers for Disease Control and Prevention BMI for age and sex growth charts (Kuczmarski et al., 2002). Pediatric overweight is defined as having a BMI at or above the 85<sup>th</sup> percentile and below the 95<sup>th</sup> percentile for age and sex; and pediatric obesity is defined as having a BMI at or above the 95<sup>th</sup> percentile (Barlow & The Expert Committee, 2007).

Weight gain occurs when a person consumes more energy than they expend (Hall et al., 2012). Energy expenditure however, can be influenced by a range of variables including: race, age, sex, environment, medication, genetics, physical activity, and diet (Hall et al., 2012; Kelly et al., 2013; Centers for Disease Control and Prevention, 2016). Chronic elevated energy intake can lead to excessive adiposity, which in turn increases an individual's risk for developing chronic diseases.

Obesity is a multifaceted, complex disease that negatively impacts many of the human body's organ systems. Excessive adiposity in children and adolescents has been associated with stiffening of the arterial walls (Urbina, Kimball, Khoury, Daniels, & Dolan, 2010), decreased endothelial cell function (Meyer, Kundt, Steiner, Schuff-Werner, 2006) and increased blood pressure (Steinberger & Daniels, 2003; Norris et al., 2011). These conditions increase an adolescents' risk for developing cardiovascular disease as an adult (Kelly et al., 2013). Adolescents who are obese are more likely to develop some form of insulin resistance in their lifetime (American Diabetes Association, 2000; Weiss et al., 2004; Morrison, Friedman, & Gray-McGuire, 2007). Further, elevated blood sugar levels may also increase an individual's risk for cardiovascular disease (Coutinho, Gerstein, Wang, & Yusuf, 1999).

These health problems are exacerbated by an accompanied reduced quality of life and mental health problems compared to healthy weight adolescents (Schwimmer, Burwinkle, & Varni, 2003). Teasing by peers and family can lead to disordered eating behaviors low self-esteem, depression, and suicidal thoughts in overweight and obese adolescents (Neumark-Sztainer et al., 2002; Eisenberg, Neumark-Sztainer, & Story, 2003). For the sake of adolescents' physical, mental, and social health, preventative strategies to improve healthy eating behaviors and food choices need to be implemented.

### **Dietary behaviors and food preparation**

American dietary behaviors have changed drastically over the recent decades. Since 1965, there has been an overall decline in time spent cooking and home meal preparation (Smith, Ng, & Popkin, 2013). Food consumption away from home has increased across all age groups (Guthrie, Lin, & Frazao, 2002), and portion sizes have increased for foods that are high in calories, added sugars, and sodium (Nielsen & Popkin, 2003; Piernas & Popkin, 2011). These

changes in consumer habits and lifestyle have made it increasingly difficult for people to meet the Dietary Guidelines for Americans (DGA) (Nicklas et al., 2013).

The DGA document provides a collection of evidence-based dietary guidelines for the general population, ages 2 years of age and older (Dietary Guidelines Advisory Committee, 2015). The guidelines provide intake goals for food groups and nutrients that are expected to reduce the risk for chronic diseases. Most Americans fail to meet the recommendations for specific food groups and micronutrients including calcium, vitamin C, vitamin D, potassium, magnesium, and dietary fiber (Dietary Guidelines Advisory Committee, 2015). Chronic underconsumption of these nutrients can increase an individual's risk for specific nutrient deficiencies and chronic diseases (Dietary Guidelines Advisory Committee, 2015). All Americans can benefit from increasing diet quality; however, adolescents ages 14-18y have a significantly lower average Healthy Eating Index 2010 score compared to other age groups (Banfield, Liu, Davis, Chang, & Frazier-Wood, 2016).

Adolescence is a time of influential behavioral and physiological changes for youth, which can impact health into adulthood (Alberga et al., 2012). Changes in hormonal regulation, body composition, and psychological development can lead to an increased risk of chronic diseases if healthy eating behaviors are not adopted (Alberga et al., 2012; Todd, Street, Ziviani, Byrne, & Hills, 2015). Improving dietary intake for adolescents may attenuate excessive weight gain and reduce risk for chronic diseases into adulthood (Mikkilä, Räsänen, Raitakari, Pietinen, & Viikari, 2004; Pan & Pratt, 2008).

Healthy behaviors formed during adolescence tend to persist into young adulthood. In a 10-year longitudinal study of adolescents' cooking attitudes and behaviors, those who cooked during adolescence were more likely to prepare food, create grocery lists, and shop for fresh



produce as young adults (Laska, Larson, Neumark-Sztainer, & Story 2012). A 5-year longitudinal reported that family meal frequency and peer support for healthy eating during adolescence were positively associated with calcium intake into adulthood (Larson, Neumark-Sztainer, Harnack, Wall, Story, & Eisenberg, 2009). Targeting the home food environment may be an effective way to make lasting improvements to adolescents' dietary intake.

Parents appear to have a stronger influence on an adolescent's food choices compared to peers (Story, Neumark-Sztainer, & French, 2002; Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003; Pedersen, Grønhøj, & Thøgersen, 2015). Maternal hours spent working and reported stress levels have been inversely associated with family meal frequency and time spent cooking by the mother (Devine et al., 2009; Bauer, Hearst, Escoto, Berge, & Neumark-Sztainer, 2012). A decline in family meal consumption may compromise adolescents' intake of nutrients including: calcium, folate, iron, vitamin C, and dietary fiber (Gillman et al., 2000). A study that analyzed data collected by the National Health and Nutrition Examination Survey 2007-2010 reported that those who prepared food at home 6-7 times per week consumed 573 fewer kilojoules per day compared to those who only cooked 0-1 times per week (Wolfson & Bleich, 2015). Daily dietary fiber consumption was also higher in the high cooking category (16.9 g) compared to the low cooking category (15.9 g). Time spent cooking has been inversely associated with BMI in females (Zick, Stevens, & Bryant, 2011). Parents have a profound influence on their children's health behaviors (Lau, Quadrel, & Hartman, 1990; Pedersen et al., 2015); however, it should be the emphasis of parents and teachers to empower youth to make healthy food choices autonomously.

### **Nutrition Education and Culinary Skills-Building Programs**

Adolescents involved in home meal preparation consume better quality diets compared to those who have limited involvement in cooking (Larson, Story, Eisenberg, & Neumark-Sztainer, 2006b; Berge, MacLehose, Larson, Laska, & Neumark-Sztainer, 2016). Through home meal preparation, adolescents learn valuable cooking skills and are less likely to rely on foods prepared away from home, which tend to be high in sodium, saturated fatty acids, and added sugars (Powell & Nguyen, 2013; Poti et al., 2014). Changing home food environments have led to a decline in cooking skills learned at home (Lang & Caraher, 2001; Lyon et al., 2011). Home economics programs have provided adolescents with culinary education in schools; however, participation in these courses has declined since the 1980's (Planty et al., 2007).

Adolescents frequently report time constraints, lack of food preparation skills, and perceived taste as barriers to eating healthy foods (Rasmussen et al., 2006; Krølner et al., 2011). Programs that improve adolescents' meal planning behaviors, competence to prepare healthy foods, and exposure to healthy foods may help overcome these barriers. The majority of nutrition education and cooking programs incorporate these strategies into their curricula; however, these programs differ dramatically in their duration, outcome measures, application of behavioral change theories, and curriculum design.

The *Gimme 5* program was a 4-year intervention that delivered nutrition lessons, taught participants how to cook with microwaves, and incorporated healthy messages into the school environment (O'Neil & Nicklas, 2002). This multifaceted program was delivered at six high schools and included six control schools; it aimed to improve adolescents' knowledge, attitudes, and consumption of fruits and vegetables. Nutrition knowledge, self-efficacy to consume fruits and vegetables, and fruit and vegetable intake increased in the intervention group compared to the control.

After participation in a two-month cooperative extension cooking program, adults and youth reported significant increases in fruit and vegetable intake, and food safety practices (Brown & Hermann, 2005). The program was composed of eight classes which provided hands-on cooking experience for the participants. These cooking principles included a variety of heat application techniques and fruits and vegetables were incorporated into the recipes. A similar program called *Culinary Camp* was an 8-day summer program which aimed to increase adolescent home food preparation frequency, to improve self-efficacy, and to develop cooking competence. The program emphasized food preparation skills including cutlery use, heat application, and food selection; proper food safety skills were also promoted. Weekly home meal preparation, attitudes, self-efficacy and parent perceptions did not increase; however, knowledge and perceived cooking ability increased significantly (Beets, Swanger, Wilcox, & Cardinal, 2007).

Theory-guided interventions can be especially effective at improving behavior changes; they offer a framework for eliciting desired behavior outcomes (Hoelscher, Evans, Parcel, & Kelder, 2002; Brooks & Begley, 2013). A culinary pilot program based upon the Social Cognitive Theory taught basic cooking skills and healthy diet practices to adolescents (n=22) 12-14 years of age twice weekly for six weeks taught basic cooking skills and healthy diet practices (Cheesen, 2008). Primary outcome measures were cooking self-efficacy, knowledge, and barriers. There was a significant increase in self efficacy but knowledge and barriers did not change. Although the authors did not define “barriers,” it could be inferred that they referred to cooking barriers since the program’s primary aim was to increase cooking self-efficacy.

Nutrition education alone may have a profound influence on adolescents’ dietary self-efficacy, attitudes, and behaviors. In a quasi-experimental design, middle school students who

participated in a 6-week constructivist-guided nutrition education program reported increases in dietary knowledge, self-efficacy, and intake of fruits, vegetables, and whole grains. Although increases in dietary knowledge (e.g. how many vegetable servings should be consumed daily) were reported, knowledge of food's role in the prevention of chronic diseases did not increase (McCaughy, Fahlman, Martin, & Shen, 2011).

Nutrition education and culinary skills-building programs have the potential to make a meaningful impact on adolescents' food choices. The available literature provides limited evidence of consistent results across programs due to inconsistencies in curricula, duration, setting, study sample, and presence of a behavior change theory. Future programs need to apply appropriate evaluation methods, incorporate environmental changes, address the needs of the study population, and include one or more appropriate behavioral change theories (Hoelscher et al., 2002; Brooks & Begley, 2013).

## **The Self-Determination Theory**

### **Overview**

Adolescents are at a unique life stage as they transition into adulthood. Their brains are still developing structurally (Paus, 2005) and adolescents they may engage in risky behaviors such as violence, and drug and alcohol use (Arnett,1992). Adolescence is an especially vulnerable stage of development, but it is not without its opportunities. Adolescents are also thinking abstractly, becoming autonomous, and beginning to understand the consequences of their actions (Sturdevant, & Spear, 2002). Satisfying the psychological needs that facilitate adolescents' motivation to engage in healthy behaviors is paramount to improving well-being and possibly attenuating engagement in reckless behaviors.

The Self-Determination Theory (SDT) is a macrotheory of human motivation that postulates that motivation to perform a behavior or task for the sake of inherent interest and enjoyment is sustained when three psychological needs are satisfied: the need for competence, relatedness, and autonomy (Deci & Ryan, 1985; Ryan & Deci, 2000). Like the SDT, earlier theories of motivation distinguish between amotivation and intrinsic motivation; however, the SDT inserts another type of motivation between the two: extrinsic motivation (Deci, Vallerand, Pelletier, & Ryan, 1991). These forms of motivation exist along a continuum, and are accompanied by additional loci of causality, regulatory styles, and regulatory processes, which will be discussed later.

### **Competence**

Theorists have asserted that the need for competence is an integral element of human motivation. This drive for humans to change their environment may be a rudimentary component of human nature (White, 1959) in which mastery of a skill elicits affective arousal, and consequently maintains interest (McClelland 1953). The SDT's concept of competence is rooted in Robert White's theory of effectance motivation. White asserted that the need for competence arises from effectance motivation- the purely hedonistic desire to manipulate one's environment (White, 1959). Effectance motivation neither seeks to accrue skills for their own sake nor for survival advantages, but just to experience the immediate reward of performing the behavior. This effectance contributes to a person's competence, or their actual ability to perform a task, as opposed to their perceived ability to perform a task.

Within the SDT, competence is an "innate, multidimensional need" with strong effects on an individual's personality and well-being (Deci & Ryan, 2002). It is the degree to which a person is capable of effectively performing a behavior or task; like effectance motivation, it is

accompanied by a sense of enjoyment and satisfaction. Fulfilling this need drives a person's motivation to practice their skill for its own sake.

An individual is intrinsically motivated when they perform a task for its enjoyment; therefore, to experience the resulting satisfaction, one must feel competent to perform said task. Thus, intrinsic motivation and competence are inextricable constructs that strengthen each other as they develop in a feedback loop. Although competence is a vital component for intrinsic motivation, it alone is inadequate for motivation. For competence to influence intrinsic motivation, it requires autonomy, which is a sense of internal locus of causality (Ryan & Deci, 2000).

### **Autonomy**

Autonomy describes the phenomenon of self-initiated and regulated actions that are congruent with personal identity, expression, and values. It is a fragile enterprise, easily influenced by internal psychological constraints and external pressures from peers, parents, and environment. Autonomous functioning has profound influence on psychological integration, value systems, and intrinsic motivation (Ryan, Sheldon, Kasser, & Deci, 1996; Ryan, Kuhl, & Deci, 1997). Autotelic individuals are concerned with self-extension and regulation; their actions are self-deriving, exhibiting an internal perceived locus of causality (Csikszentmihalyi, 1975).

Ryan underlined the important symbiosis among autonomy, autonomy support, and relatedness with parents and caregivers in early childhood (1993). Developing a sense of the self as an individual and locus of causality is necessary for cultivating intrinsic motivation. Without the supportive conditions and subsequent autonomous functioning, the child's psychological, social, and overall well-being are diminished (Grolnick & Ryan 1989; Egeland & Farber, 1984).

## **Relatedness**

Relatedness is the need for strong interpersonal relationships with family, peers, and authoritative figures and for a general sense of belonging in one's own milieu (Deci et al., 1991). People are more likely to internalize their behaviors or shared values of a group they admire and to whom they feel close (Ryan and Deci, 2000). Other theorists like Lev Vygotsky (Vygotsky, 1925) agree that social interactions are crucial for human development; further, he asserts that learning necessitates interpersonal relationships with peers and teachers (Tudge & Scrimsher, 2003).

Relatedness and autonomous functioning may appear to be juxtaposed concepts; autonomy requires independence while relatedness emphasizes connectedness. Within the context of the SDT, however, the two share a unique relationship. First, autonomy is not characterized by emotional detachment and social independence; rather, it is a person's intention to act of their own volition (Ryan & Deci, 2000). An individual's relatedness with family, friends, and peers is posited to facilitate internalization of values, the development of personal identity, and intellectual functioning. Additionally, students' relatedness with their teachers and parents are associated with learning motivation and functioning in school (Ryan, Stiller, and Lynch, 1994).

## **Autonomy Support**

The needs for competence, autonomy, and relatedness are necessary for intrinsic motivation but are not self-sustaining. They require supportive conditions that foster their development. In educational settings, autonomy support is derived from teachers' and their ability to support the expression of students' innate motivation, internalization of values, and engagement in the classroom (Deci et al., 1991; Reeve, 2006). Likewise, parents and guardians

are responsible for providing a needs-supportive environment at home (Deci & Ryan, 1987; Deci et al., 1991).

Traditional means for encouraging a behavior include close supervision and manipulative strategies such as imposing deadlines and offering rewards or punishments. These may result in a desired behavior outcome, but tend to undermine intrinsic motivation because interest in the behavior declines after the reward is received or fear of punishment has subsided (Deci, Nezlek, & Sheinman, 1981; Deci, et al., 1991). Surveillance and manipulation are said to be controlling as they do not allow for an individual to truly operate autonomously.

An autonomy-supportive environment does not rely on extraneous pressures; instead, it supports conditions that allow an individual to operate independently and requires the person in the supporting role to reciprocate positive feedback (Deci, et al., 1991). This environment must be non-controlling and delivered in a framework relatable with the recipient. Otherwise, he or she may feel manipulated, thus diminishing internalization and consequently intrinsic motivation (Deci, et al., 1991).

### **Nature of Motivation and Regulatory Styles**

The SDT proposes a continuum of motivation (Figure 1) from amotivation, to intrinsic motivation with four types of extrinsic motivation spanning the gap between the two (Ryan & Deci, 2000). Some tasks are not performed for their enjoyment; external regulators such as rewards, fear of punishment, or perceived benefits compel an individual to act (Deci et al., 1991). Through a process called internalization, individuals actively integrate external stimuli into internal regulation (Deci et al., 1991).

Within extrinsic motivation there are four regulatory styles in varying degrees of autonomy: external, introjected, identified, and integrated regulation (Ryan & Deci, 2000). The



theory does not assert that individuals must move through each stage of the continuum to become intrinsically motivated. For example, value systems can be integrated while there are still interjected contingencies like reward, punishment, or deadlines. Over time, however, people tend to assimilate behaviors and develop more autonomous regulatory styles.

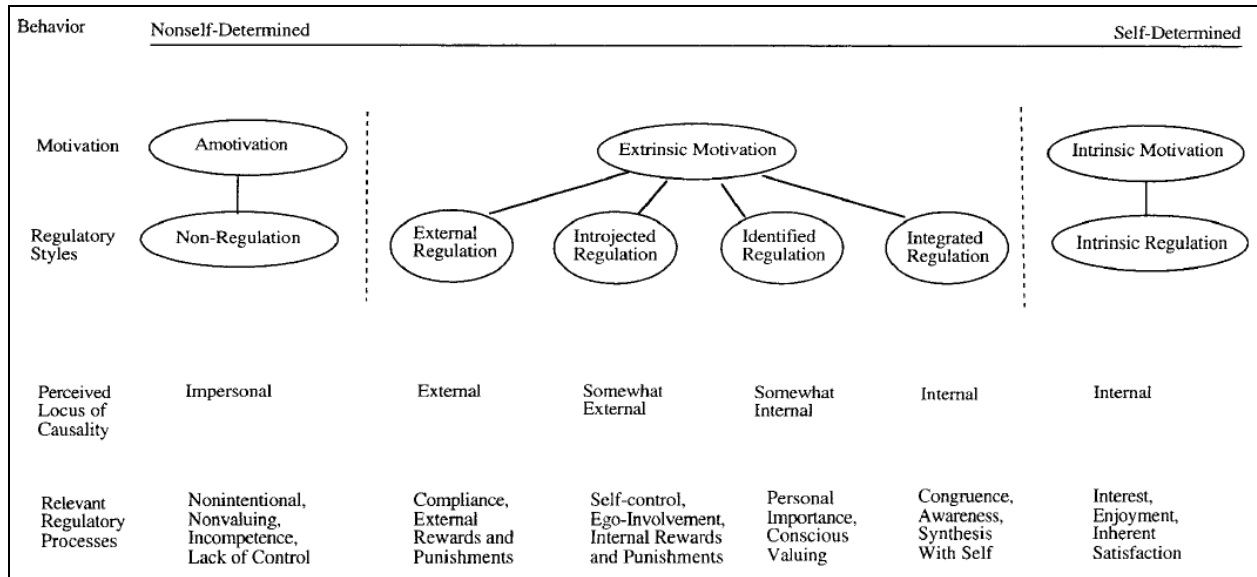


Figure 1. The Self-Determination Continuum Showing Types of Motivation With Their Regulatory Styles, Loci of Causality, and Corresponding Processes. Reprinted from “Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being.” By R. Ryan & E. Deci, 2000, *American Psychologist*, 55(1), 72. Copyright 2000 by the American Psychological Association. Reprinted with permission.

The two regulatory styles that exhibit external perceived loci of causality are external and introjected regulation. External regulation is the least autonomous of the extrinsic regulatory styles; behavior under this style is performed because of promise of rewards or fear of punishment (Deci et al., 1991). This type of regulation is perceived as controlled, often making the person feel void of autonomy (Ryan & Deci, 2000). When the constraints that contribute to external regulation become internalized without additional coercion, this is known as introjected

regulation. At this stage, the behavior is performed to satisfy the ego or to avoid guilt, anxiety, or other negative consequences.

The two regulatory styles accompanied by internal perceived loci of causality are identified and integrated regulation. Identified regulation occurs after the regulatory process has been accepted and the behavior is valued. The individual recognizes the importance of the behavior and accepts it as a part of their value system. Lastly, integrated regulation, which is the closest to intrinsic motivation, occurs when the regulation process is fully integrated and there is internal congruence of ideals; however, the behavior is still performed for the perceived value of the outcome (Deci et al., 1991).

### **The SDT in practice**

The SDT has only recently been explored as a guiding behavior change theory within physical health and nutrition, and has shown promising results (Silva, Marques, & Teixeira, 2014). Intrinsic motivation to exercise has been identified as a predictor of short- and long-term weight loss for women participating in a weight-control program (Teixeira et al., 2006; Palmeira et al., 2007). Autonomous motivation to eat fruits and vegetables has been positively associated with fruit and vegetable intake (Shaikh et al., 2011; McSpadden et al., 2014). The SDT has also been proposed as a framework to address disordered eating (Verstuyf, Patrick, Vansteenkiste, & Teixeira, 2012).

As discussed earlier, nutrition education and culinary skills-building programs have the potential to positively influence dietary behaviors. However, among other limitations, these programs lack a unifying behavior change theory. The SDT has not yet been integrated into these programs despite its promise in other health-behavior programs. Instruments need to be developed that can measure the SDT constructs in order to investigate the usefulness of the SDT

in nutrition education and culinary skills-building programs. Currently, there are no instruments tailored to these programs.

### **CHAPTER 3**

## **EXPLORATORY AND CONFIRMATORY FACTOR ANALYSIS OF THE ADOLESCENT MOTIVATION TO COOK QUESTIONNAIRE: A SELF DETERMINATION THEORY INSTRUMENT\***

### **Introduction**

Adolescents and young adults who report more frequent food preparation are more likely to have better diet quality and consume fewer convenience foods (Larson et al., 2006a; Larson et al., 2006b); yet, over the past few decades the number of adolescents participating in school-based cooking classes has decreased (Planty et al., 2007). Not surprisingly, studies suggest that adolescents lack food preparation skills (Lang & Caraher, 2001). As a result, youth transitioning into adulthood may lack competence to prepare meals or individual foods.

Currently, 31.8% of US adolescents are categorized as overweight or obese (Ogden, Carrol, Fryar, & Flegal, 2015), and participation in culinary skill-building programs may be an effective way to lower risk for unhealthy weight status (Davis, Ventura, Cook, Gyllenhammer, & Gatto, 2011). A recent cohort study that followed women and men for eight years found that individuals who prepared more meals at home had better quality diets and experienced less weight gain (Zong, Eisenberg, Hu, & Sun, 2015). Although some studies show improvement in outcome measures like diet quality and weight status following participation in a cooking class, the evidence is equivocal. A recent review of the benefits of culinary skills-building programs identified several limitations within the literature: the lack of long-term studies, inconsistent evaluation tools, and limited sample size (Reicks, Trofholz, Stang, & Laska, 2014).

Organizations including the Academy of Nutrition and Dietetics, the Center for Disease

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\*This chapter previously appeared as: Miketinas, D., Cater, M., Bailey, A., Craft, B., & Tuuri, G. (2016). Exploratory and confirmatory factor analysis of the Adolescent Motivation to Cook Questionnaire: A Self-Determination Theory instrument. *Appetite*, *105*, 527-533. Reprinted under license agreement from Elsevier.

Control and Prevention, and the Institute of Medicine recommend that interventions be based upon one or more behavioral change theories (Hoelscher et al., 2013; Centers for Disease Control and Prevention, 2011; Koplan et al., 2005). These theories offer a systematic approach to understanding behaviors and processes for a wide range of phenomena. They define specific concepts and constructs, and the relationships between them. A theory must address desired outcomes and be applicable to the population of interest within a specific environment (Rimer & Glanz, 2005).

The Self Determination Theory (SDT) is an appropriate behavioral change theory to use with adolescents in a school-based setting because of its focus on fostering important psychosocial constructs in preparation for adulthood. These constructs include competence, autonomy, autonomy support, and relatedness (Ryan & Deci, 2000; Deci & Ryan, 2008). Competence is an individual's ability to efficiently complete a task, autonomy is the sense of independence an individual has when making decisions, autonomy support describes the environment that allows for the expression of autonomous behavior, and relatedness refers to the general feeling of closeness to others (Ryan & Deci, 2000; Deci & Ryan, 2008). According to the SDT, motivation to perform a task is sustained when these needs are met.

The SDT has been used to address personality development and behavioral self-regulation across many disciplines including sports, education, and healthcare (Ryan & Deci, 2000; Deci & Ryan, 2008). The SDT has provided a theoretical framework for improving food choices, regulating eating, smoking cessation, and increasing physical activity (Schösler, de Boer, & Boersema, 2014; Vertsuyf, Paariak, Vansteenkiste, & Teixeira, 2012; Williams et al., 2006; Landry & Solomon, 2002). To our knowledge, the SDT has not yet been applied to a culinary skill-building program, but motivation and competence to cook have been implicated as

possible drivers of positive food choices (Schösler et al., 2014). Shösler and colleagues (2014) reported that those who were intrinsically motivated to select foods were more likely to choose vegetable-based snacks compared to those whose motivation was described as “introjected.” Although the applicability of the SDT in a culinary skills-building program is not established, an instrument to measure this theory’s constructs within this setting is necessary to evaluate its appropriateness. Therefore, the purpose of this research was to develop a questionnaire, based upon the theoretical framework provided by the SDT that was capable of measuring the psychological needs that elicit and support motivation to prepare healthy foods (Ryan & Deci, 2000).

### **Development of the items for the Adolescent Motivation to Cook Questionnaire**

The Adolescent Motivation to Cook Questionnaire (AMCQ) was developed to measure high school adolescents’ intrinsic motivation and perceived competence to cook healthy foods and the relevant psychosocial constructs identified by the SDT. To reflect the key recommendations of the Dietary Guidelines for Americans 2010 (McGuire, 2011), the AMCQ described examples of healthy foods as, “fruits, vegetables, low-fat milk and milk products, and whole grains” and less healthy foods as “foods high in sodium (salt), solid fats, and added sugars.” The AMCQ included statements pertaining to intrinsic motivation and perceived competence to prepare healthy foods, autonomy to make decisions in class, autonomy support within the classroom, and relatedness with peers. Each statement was accompanied by a five-point Likert-type scale response including: “disagree a lot,” “disagree,” “neither agree/disagree,” “agree,” and “agree a lot.”

The statements used to assess intrinsic motivation measured interest or enjoyment to prepare healthy foods. These statements were adapted from the Intrinsic Motivation Inventory,

developed by Deci and Ryan and validated by McAuley and colleagues (McAuley, Duncan, & Tammen, 1989). The perceived competence statements are intended to assess an individual's perception and satisfaction of their own food preparation skills. Global, rather than domain-specific, competence is addressed in this study. These statements included concepts of personal satisfaction with cooking skills and competence to cook compared to peers. These items were also adapted from the Intrinsic Motivation Inventory (McAuley et al., 1989). The syntax for the intrinsic motivation and perceived competence items were adjusted to pertain to food preparation and to be at an appropriate reading level. 'Food preparation' was used rather than 'cooking' because cooking may imply heat application and exclude other culinary techniques necessary for meal preparation.

Autonomy support statements addressed the instructor's ability to foster an autonomous learning environment. They included feelings of teacher empathy, support, and personal empowerment. These statements were adapted from the six-item version of the Learning Climate Questionnaire, developed by Williams, Geoffrey, and Deci (1996). Item syntax was adjusted for comprehension and to be in present tense.

An individual's sense of independence and confidence when making decisions was estimated from statements about personal autonomy. These statements contained items relevant to class participation, freedom to participate, and personal expression. The autonomy statements were adapted from Weinstein and colleague's index of autonomous functioning (Weinstein, Przybylski, & Ryan, 2012). Statements were adapted to pertain to the classroom setting and for comprehension.

Statements addressing relatedness examined a general feeling of closeness, sense of belonging, and the quality of an individual's relationships with their peers. These statements

were adapted from the Intrinsic Motivation Inventory (McAuley et al., 1989). Items were adjusted to refer to classmates and for comprehension.

## **Study 1: Questionnaire Development**

### **Methods**

A convenience sample of five schools from East Baton Rouge and Ascension Parishes in the U.S state of Louisiana participated in the preliminary analyses. Students were recruited with the help of teachers and administrators at each school to voluntarily complete the questionnaire. Students who were younger than 13 years of age, older than 19 years of age, not currently enrolled in grades 9<sup>th</sup> -12<sup>th</sup>, or pregnant were excluded from participating. Researchers provided the students with the questionnaires within their classrooms and responses were kept anonymous.

Twenty-nine statements were included on the initial version of the AMCQ. The numbers of statements for each psychosocial construct were as follows: six for intrinsic motivation, five for perceived competence, six for autonomy support, six for relatedness, and six for autonomy. Examples of healthy and less healthy foods were described at the top of the questionnaire. The questionnaire was reviewed for structure, reading level, comprehension, and applicability and approved by a committee of nutrition educators prior to distribution. Iterative feedback from 9<sup>th</sup> – 12<sup>th</sup> grade students was gathered to assess cognitive understanding of the items. Parental consent and adolescent assent were obtained prior to analysis. The study was approved by the Louisiana State University Agricultural Center Institutional Review Board.

One hundred seventy students (47% female) representing grades 9<sup>th</sup> – 12<sup>th</sup> (44%, 16%, 11%, and 29%, per grade respectively) were recruited. One hundred sixty-one students completed the survey for a response rate of 94.7%. Race and ethnic groups represented included: African American (48%), Caucasian (39%), Hispanic (8%), and Other or Mixed Race.



Exploratory factor analysis (EFA) with a promax (oblique) rotation was performed on the 29 statements to identify latent factors. The correlation matrix was examined for items exhibiting extreme multicollinearity (i.e.  $r > 0.90$ ) (Field, 2009). No extreme multicollinearity was observed. Items were considered retained if loadings on both the factor and structure matrices were greater than 0.4 (Guadagnoli & Velicer, 1988). The factor inclusion criterion was based on eigenvalues greater than 1 and the scree plot point of inflection. Factors with two or fewer loaded items were not considered interpretable (Velicer & Fara, 1998). Analyses were conducted using SPSS (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp).

## **Results**

After performing the exploratory factor analyses (EFA), one intrinsic motivation, one relatedness, and two autonomy statements were removed to create the final version of the AMCQ (see Appendix A). The intrinsic motivation and relatedness items were removed because they had coefficients less than 0.40. The two autonomy statements factored together and were deemed uninterpretable. These two items were negatively phrased, which may explain why they did not factor with the other autonomy statements. The final analysis returned five factors which described each of the five psychosocial constructs and explained 55.4% of total variance. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.852, indicating a good sample size. Bartlett's test of sphericity was significant ( $p < 0.000$ ) which indicated the variables were not uncorrelated.

## **Study 2: Exploratory and Confirmatory Factor Analysis of the AMCQ**

The final version of the AMCQ consisted of 25 items and was reviewed by a committee of nutrition educators and approved for use with a high school audience. The survey included

statements about: intrinsic motivation and perceived competence to prepare healthy foods, autonomy support, autonomy, and relatedness (See Appendix A). The same five-point Likert-type scale was used to evaluate each statement. The description of healthy and less healthy foods previously provided was included to reflect the key recommendations of the Dietary Guidelines for Americans 2010 (McGuire, 2011).

## **Methods**

Parental consent to complete a survey was obtained prior to student participation, and the study was approved by the Louisiana State University Agriculture Institutional Review Board. Participants were asked to provide demographic information and complete the AMCQ indicating on a five-point Likert-type scale how much they agreed or disagreed with each statement. The questionnaire was mailed to 788 high school students residing in 64 different parishes in the U.S. state of Louisiana who were enrolled in a 4-H summer camp. Five hundred ninety-three high school students completed surveys for a 75.3% response rate. For the purposes of conducting both an EFA and CFA, participants were randomly assigned to one of two, approximately equal groups. Confirmatory factor analysis requires more observations compared to the exploratory factor analysis. Due to the available sample size, equal grouping would have oversupplied observations for the EFA and deprived observations for the CFA. Two hundred sixty-six participants were randomly assigned to Group 1 for the EFA, the remaining 327 were assigned to Group 2 for the CFA.

Exploratory factor analysis with a promax (oblique) rotation was performed on responses in Group 1. Sample size was measured using the KMO Measure of Sampling Adequacy. Items were retained if factor loadings on both the factor and structure matrices were greater than 0.4 (Guadagnoli & Velicer, 1988). The factor inclusion criterion was based on eigenvalues greater

than 1 and scree plot point of inflection. Additionally, factors with two or fewer loaded items were not considered interpretable (Velicer & Fara, 1998). Cronbach's  $\alpha$  was computed for each factor to measure factor internal consistency. Analyses were conducted using SPSS (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp).

### **Results: Exploratory Factor Analysis**

The responses for 245 participants remained for analysis after missing data were excluded. Fifty-seven percent of participants were female. Racial/ethnic representation included: 80% Caucasian, 14% African American, and 6% Other or Mixed Race. The distribution of the respondents' grade levels were as follows: 28%, 28%, 22%, and 22% for grades 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup>; respectively.

One EFA was performed. This analysis had a good sample size ( $KMO = 0.89$ ) and significant sphericity (Bartlett's Test  $< 0.000$ ). The correlation matrix was examined for items exhibiting extreme multicollinearity (i.e.  $r > 0.90$ ) (Field, 2009). No extreme multicollinearity was observed. Five factors were returned that explained 65.3% of the variance; for variance explained by each factor, see Table 1. Cronbach's alphas were 0.92, 0.92, 0.92, 0.88, and 0.85 for Factors 1, 2, 3, 4 and 5 respectively. Table 1 details the correlation coefficients and communalities for each factor. This five-factor model identified by the EFA served as the hypothesized model for the subsequent CFA.

### **Results: Confirmatory Factor Analysis**

After removing participants with no responses, those randomly assigned to Group 2 served as the sample for the CFA ( $N = 315$ ). Sixty-seven percent of the participants were female. Racial/ethnic representation included: 82% Caucasian, 11% African American, and 7%

Other or Mixed Race. The distribution of the respondents' grade levels were as follows: 30.5%, 29%, 23%, and 17.5% for grades 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup>; respectively.

Table 1. Exploratory Factor Analysis Pattern and structure matrices with communalities and explained variance by each factor

Items by Factor	Pattern Matrix	h <sup>2</sup>	Structure Matrix	Explained Variance
Factor 1: Autonomy Support				34.0%
My instructor provides me with choices and options.	0.75	0.53	0.72	
I feel my instructor understands me.	0.82	0.68	0.82	
My instructor expresses confidence in my ability to do well in the course.	0.82	0.71	0.84	
My instructor encourages me to ask questions.	0.78	0.63	0.79	
My instructor listens to how I would like to do things.	0.79	0.69	0.83	
My instructor considers how I see things before suggesting a new way to do things	0.83	0.68	0.82	
Factor 2: Intrinsic Motivation				13.8%
I enjoy preparing healthy food very much.	0.73	0.67	0.81	
I think it is fun preparing healthy food.	0.74	0.72	0.84	
Preparing healthy food holds my attention well.	0.89	0.75	0.86	
I would describe preparing healthy food as very interesting.	0.83	0.67	0.82	
Preparing healthy food is quite enjoyable.	0.90	0.73	0.85	
Factor 3: Perceived Competence				9.1%
I think I am pretty good at preparing healthy food.	0.69	0.69	0.82	
I do pretty well preparing healthy food compared to other people my age.	0.83	0.75	0.86	
I feel pretty confident about my food preparation skills.	0.79	0.55	0.73	
I am satisfied with my ability to prepare healthy foods.	0.82	0.77	0.88	
I am pretty skilled at preparing healthy food.	0.93	0.78	0.88	

(Table 1. Continued)

Factor 4: Relatedness				5.0%
I can really trust my classmates.	0.63	0.42	0.65	
I'd like a chance to interact with my classmates more often.	0.77	0.61	0.77	
It is likely that my classmates and I could become friends if we interacted a lot.	0.76	0.58	0.76	
I feel close to my classmates.	0.83	0.65	0.80	
I really enjoy interacting with my classmates.	0.81	0.69	0.82	
Factor 5: Autonomy				3.4%
If I had the choice, I would choose to take this class.	0.80	0.59	0.76	
I feel comfortable participating in class.	0.78	0.59	0.77	
I feel free to make my own decisions in class.	0.66	0.55	0.74	
I feel free to express myself, my opinions, and my concerns in class.	0.76	0.66	0.81	

Data ( $N = 315$ ) were assessed for influential univariate and multivariate outliers.

Univariate outliers were identified by examining z-scores for each construct; scores greater than 3.29 (two-tailed) were considered outliers ( $p < 0.001$ ). Multivariate outliers were identified by using the Mahalanobis distance;  $\chi^2$  values greater than 19.46 ( $p < 0.001$ ) were considered outliers.

Six youth had scores on autonomy support that were identified as univariate outliers, and one youth's autonomy score was an outlier. In all seven cases, the scores were extremely low and were well beyond the criterion for identifying univariate outliers. While it is unclear from the data why the youth felt such a low sense of autonomy or autonomy support, the decision was made to delete their data from further analysis. Multivariate outliers were assessed, and five cases with values exceeding the critical chi-square value were discovered. Dummy coding of each case allowed further examination of the causes of the outlying cases. Regression revealed that autonomy, autonomy support, perceived competence, and relatedness were significant predictors of each case. Since little information was lost, the cases were deleted from the

analysis. After outliers were excluded, 303 participants remained for analysis. While observations were independent, the data for all five constructs exhibited non-normality; thus, maximum likelihood with standard errors and a chi-square test that was robust to non-normality (MLR) was selected for the confirmatory factor analysis (Kline, 2005). Analysis of missing data revealed that data were missing completely at random. Full information maximum likelihood was used to handle missing data.

Mplus (Muthén & Muthén, 2012) was used to conduct the CFA. A single-factor solution was estimated first to test the hypothesis of the fit of the items on a unidimensional latent construct. This model was a very poor fit of the data as indicated by the fit indices (see Table 2).

Table 2. Goodness-of-Fit Indicators of Models for the Adolescent Motivation to Cook Questionnaire (n = 303)

Model	$\chi^2$	df	RMSEA	CFI	TLI	SRMR
Single Factor	2253.58***	275	.151 [.145 to .157]	.49	.44	.18
Five Factor	524.97***	265	.056 [.049 to .063]	.93	.92	.04

RMSEA, Root-Mean-Square Error of Approximation; CFI, Comparative Fit Index; TLI, Tucker-Lewis Index; SRMR, Standardized Root-Mean-Square Residual.

\*\*\*p < .001

The next step in the analysis was to test the hypothesized five factor model that emerged from the EFA. Support for adequate fit of the hypothesized five factor model was found. The chi-square statistic was reduced, though it was still statistically significant. Given the small *N* and non-normality of the data, common practice advised the examination of alternative fit indices like RMSEA, CFI, TLI, and SRMR (Brown, 2006). Hu and Bentler (1999) suggested a cutoff value close to .06 for a well-fitted model. The RMSEA value and confidence interval (see Table 2) for the present model imply that the model is a fit for the data. Both the CFI and TLI values were slightly less than the .95 criteria suggested by Hu and Bentler (1999). The SRMR value falls well within the .08 standard recommended by Hu and Bentler and meets Geiser's (2013) guideline that values below .05 are indicative of a good fit. The standardized parameter

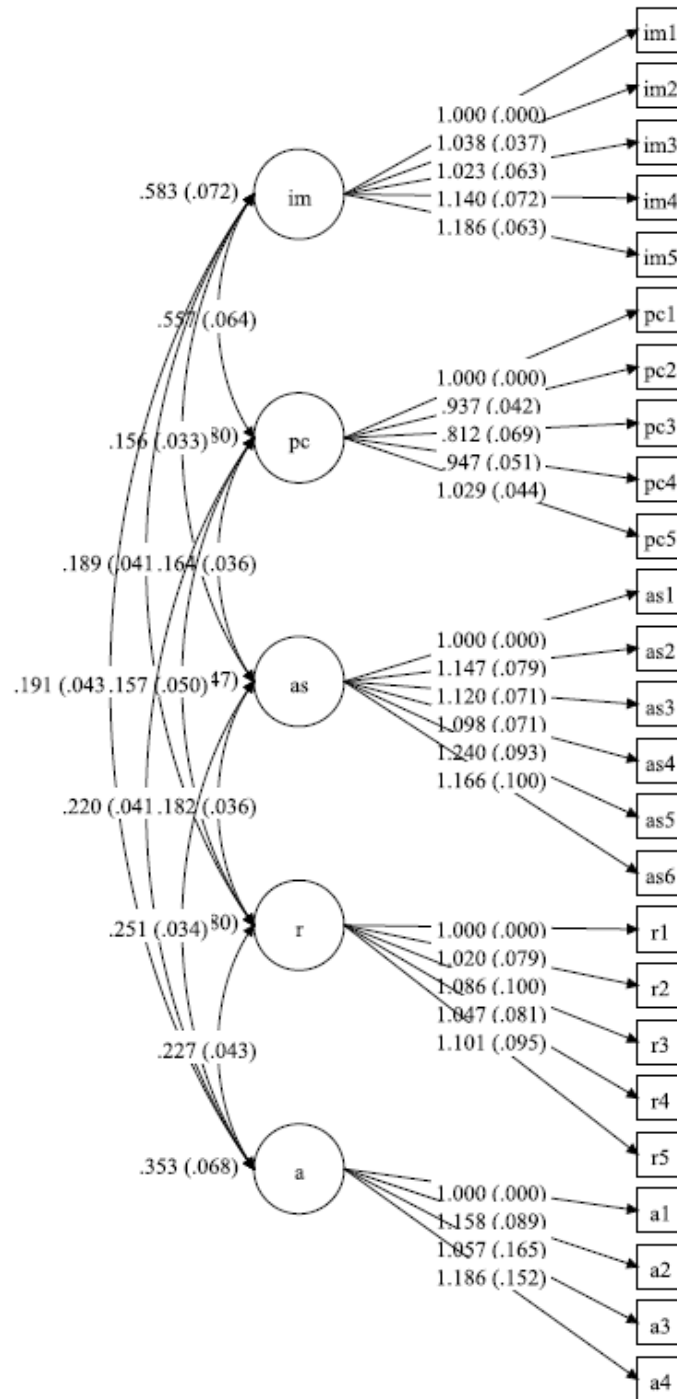


Figure 1. Confirmatory factor analysis of the five-factor Adolescent Motivation to Cook Questionnaire. Parameter estimates are included for each path with standard errors provided in parenthesis for each estimate. *Note:* im = intrinsic motivation, pc = perceived competence, a = autonomy, as = autonomy support, r = relatedness

estimates and error terms are presented in Figure 1.

Next, correlations among factors were examined. Strong relationships between perceived competence and intrinsic motivation ( $r = .79$ ) and autonomy and autonomy support ( $r = .72$ ) were returned (see Table 3), supporting prior research (Weinstein et al., 2012). Relatedness and perceived competence were weakly related. All other factors shared a moderate relationship.

Table 3.  
Correlations among Adolescent Motivation to Cook Factors

	1	2	3	4	5
1. Intrinsic Motivation (IM)	1.00				
2. Perceived Competence (PC)	.79***	1.00			
3. Autonomy Support (AS)	.35***	.31***	1.00		
4. Relatedness (R)	.34***	.24***	.43***	1.00	
5. Autonomy (A)	.42***	.40***	.72***	.53***	1.00

Cronbach's alpha: Intrinsic Motivation:  $\alpha = .94$ ; Perceived Competence:  $\alpha = .92$ ; Autonomy Support:  $\alpha = .94$ ; Relatedness:  $\alpha = .90$ ; Autonomy:  $\alpha = .85$ ;

\*\*\* $p < .001$

## Discussion

The results of this study provide preliminary evidence for the validity of the AMCQ for use with high school adolescents. Currently, no questionnaires exist that attempt to measure the psychosocial constructs of the SDT with respect to motivation and competence to cook in the high school population. With further development, it may be used to examine the SDT constructs of intrinsic motivation and perceived competence to cook healthy foods, autonomy support from teachers, relatedness to peers, and autonomy in a high school classroom setting.

While studies have supported the effectiveness of cooking intervention programs (Nelson, Corbin, & Nickols-Richardson, 2013; Cunningham-Sabo & Lohse, 2014; Robson, Crosb, & Stark, 2016), more research is needed. To our knowledge, culinary skill-building programs have not used the SDT as the guiding theory for behavioral change. Instead, the Social



Cognitive Theory (SCT) (Rimer & Glanz 2005) has been most frequently used. The SCT and SDT have underlying similarities but are built upon distinctly different constructs.

The SCT postulates that personal and environmental factors affect an individual's behavior (Rimer & Glanz 2005). To modify behavior, SCT proposes targeting external regulators such as the home environment, goals, and perceived benefits of performing a behavior or task. Additionally, personal factors like knowledge and self-efficacy are addressed to modulate behavior.

The SDT differs from the SCT because of its focus on building autonomous rather than controlled motivation to perform a behavior or task. Autonomous motivation is a function of intrinsic motivation and the extrinsic factors identified by an activity's perceived value. Conversely, controlled motivation is characterized by external regulation, where behavior is influenced by reward or punishment, and interjected regulation of behavior by social pressures (Ryan & Deci, 2000). Autonomous and controlled motivation may both result in behavior change; however, the former has been shown to yield greater psychological health, and more effective performance (Ryan & Deci, 2000). Because of its emphasis on performing a behavior for the enjoyment rather than reward or punishment, the SDT may be more appropriate for use with an adolescent population.

The ability of the AMCQ to measure autonomy within the classroom allows for researchers to identify whether students' motivation to participate, make decisions, and express themselves is internally regulated or not (e.g. controlled). The inclusion of autonomy support items is useful to measure if autonomy is being fostered or diminished within the classroom. An autonomy-supportive environment is crucial to fostering autonomous motivation, and

subsequently, intrinsic motivation (Ryan & Deci, 2000). By measuring these two, distinct constructs researchers can better identify barriers of a student's autonomous motivation.

The strong relationship observed in this study between perceived competence and intrinsic motivation is reflective of the SDT's argument that competence can enhance intrinsic motivation for a task. Studies in the Physical Education domain have found that competence appears to exhibit a strong influence on intrinsic motivation (Goudas, Biddle, & Fox, 1994; Cury et al., 1996; Ntoumanis, 2001). Previous studies have also observed a positive relationship between autonomy and autonomy support; additionally, the SDT postulates that autonomous regulation can only be achieved within an autonomy-supportive environment (Weinstein et al., 2012; Ryan & Deci, 2000).

The strengths of this study include the diversity of the samples, adequate sample sizes, and high internal consistency of the sub-scales; however, there are several limitations. Adolescent boys, Hispanics, and African Americans were under-represented, and participants were from only one U.S. state. As with any self-reported measurement, this study is also limited by the truthfulness of participant response. Further studies should examine this instrument's validity in other age groups, geographical regions, settings, and against independent measures of cooking. Additionally, this questionnaire needs to be tested for convergent and divergent validity.

Preventative measures from the individual to the community level must be implemented to combat the obesity epidemic especially for susceptible groups like adolescents, who are at critical stage of development. A focus on education and positive behavioral change for adolescents is crucial to influence habits that will be sustained into adulthood. Since adolescents spend most of their daytime at school, high schools can serve as a conduit for these health-

promoting programs. Therein is the need for a SDT-guided tool like the AMCQ to measure change in behavior within the intervention setting. Initial testing suggests that this questionnaire is useful; however, the reader is cautioned that additional testing is needed before it can be used to measure behavioral change.

## Acknowledgements

This work was supported in part by United States Federal Hatch Act Funds Lab # 93846 and the Louisiana 4-H program.

## Appendix A

Adolescent Motivation to Cook Questionnaire Factors, Variable names, Order, Items, Response Options, and Instructions.

Factor	Variable name	Order (#)	Items	Response Options
Intrinsic Motivation <sup>a</sup>	IM1	1	I enjoy preparing healthy food very much.	Disagree a lot
	IM2	2	I think it is fun preparing healthy food.	Disagree
	IM3	3	Preparing healthy food holds my attention well.	Neither
			I would describe preparing healthy food as very interesting.	Agree/Disagree
			Preparing healthy food is quite enjoyable.	Agree
Perceived Competence <sup>a</sup>	IM5	5	Preparing healthy food is quite enjoyable.	Agree a lot
	PC1	6	I think I am pretty good at preparing healthy food.	
	PC2	7	I do pretty well preparing healthy food compared to other people my age.	
	PC3	8	I feel pretty confident about my food preparation skills.	
	PC4	9	I am satisfied with my ability to prepare healthy foods.	
Autonomy Support <sup>b</sup>	PC5	10	I am pretty skilled at preparing healthy food.	
	AS1	11	My instructor provides me with choices and options.	
	AS2	12	I feel my instructor understands me.	
	AS3	13	My instructor expresses confidence in my ability to do well in the course.	
	AS4	14	My instructor encourages me to ask questions.	

(Appendix A. Continued)

	AS5	15	My instructor listens to how I would like to do things.
	AS6	16	My instructor considers how I see things before suggesting a new way to do things
Relatedness <sup>c</sup>	R1	17	I can really trust my classmates.
	R2	18	I'd like a chance to interact with my classmates more often.
	R3	19	It is likely that my classmates and I could become friends if we interacted a lot.
	R5	21	I really enjoy interacting with my classmates.
Autonomy <sup>d</sup>	A1	22	If I had the choice, I would choose to take this class.
	A2	23	I feel comfortable participating in class.
	A3	24	I feel free to make my own decisions in class.
	A4	25	I feel free to express myself, my opinions, and my concerns in class.

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Fruits, vegetables, low-fat milk and milk products, and whole grains were considered healthy foods while foods high in sodium (salt), solid fats, and added sugars are considered less healthy.

<sup>a</sup> Instructions: The following sentences refer to your overall experiences preparing healthy food.

Using the 5-point scale below, please indicate the extent to which you agree with the statements by completely filling in your response.

<sup>b</sup> Instructions: Please indicate how much you agree or disagree with the following statements about your instructor in this class:

<sup>c</sup> Instructions: Please indicate how much you agree or disagree with the following statements about your fellow classmates in this class:

<sup>d</sup> Instructions: Please indicate how much you agree or disagree with the following statements about your actions in this class:

## **CHAPTER 4**

# **RELIABILITY MEASUREMENTS AND APPLICATION OF THE ADOLESCENT MOTIVATION TO COOK QUESTIONNAIRE IN A NUTRITION EDUCATION AND CULINARY SKILLS-BUILDING PROGRAM**

### **Introduction**

Adolescents who assist their family in home meal preparation are more likely to consume higher quality diets (Larson et al., 2006b; Berge et al., 2016). This is due to increased fruit, vegetable, and dietary fiber consumption and a decreased intake of foods high in sodium, saturated fatty acids, and added sugars (Larson et al., 2006b; Berge et al., 2016). However, it has been reported that more than half of families prepare meals at home five or fewer times per week (Virudachalam, Long, Harhay, Polsky, & Feudtner, 2014) and adolescents are not learning food preparation skills at home (Lang & Caraher, 2001; Lyon et al., 2011). Culinary skills-building programs were once a part of home economics curricula; however, the number of students who have participated in these programs has decreased dramatically in recent decades (Planty, et al., 2007). Professional and government agencies have advocated for the implementation of theory-guided school- and community-based nutrition education and culinary skills-building programs to promote healthful behaviors like home-meal preparation. (Hoelscher et al., 2002; Centers for Disease Control and Prevention, 2011; Koplan et al., 2005; Krebs et al., 2003).

Although adolescents who have participated in nutrition education and cooking programs have demonstrated limited and inconsistent changes in dietary behaviors, knowledge and self-efficacy outcomes are generally achieved. Increases in fruit and vegetable consumption have also been reported by several programs (O'Neil, & Nicklas, 2002; Brown & Herrman, 2005; McAleese, & Rankin, 2007; Condrasky, Quinn, & Cason, 2008). Other interventions that found no differences in intake have reported changes in a range of knowledge, attitudes, and health

behaviors (Beets et al., 2007; Cheesen, 2008; Meehan, Yeh, & Spark, 2008; Evans et al., 2012). These programs, however, are difficult to compare due to differences in underlying study designs, behavior-change theories chosen, participant demographics, program duration, and data collection methods.

Behavior-change theories provide a framework useful for targeting and measuring the successes of desired behavioral outcomes (Rimer & Glanz, 2005). The Social Cognitive Theory, which focuses on the complex interplay between psychological enterprise and societal constructs, has been the most commonly used theory by these programs to promote health-related behavioral change (Hoelscher et al., 2002; Bandura, 2001). In contrast, the Self-Determination Theory (SDT) posits that motivation to perform a desirable behavior is supported by autonomous functioning, and is diminished by external regulators (Ryan, & Deci, 2000; Deci, & Ryan, 2008).

To our knowledge, no nutrition and culinary skills-building program has used the SDT as a framework for behavior change despite its demonstrated promise as a theoretical framework for health-related interventions. Teixeira and colleagues (Teixeira et al., 2006) demonstrated that after participating in a four-month, lifestyle modification and weight-reduction program, subjects who reported high levels of intrinsic motivation for physical activity had greater weight loss at the one-year follow-up examination compared to those who reported low levels. Additionally, adults who indicated high levels of autonomous motivation to eat fruits and vegetables reported greater fruit and vegetable intake compared to those who indicated high levels of controlled motivation (McSpadden et al., 2014). Although there is evidence for the SDT's applicability as a guiding theory for adult-targeted nutrition programs, few research studies have integrated the SDT into nutrition programs for adolescents.

The Adolescent Motivation to Cook Questionnaire (AMCQ) has the potential to measure changes in the SDT constructs as a result of participating in nutrition education and culinary skills-building programs. The instrument's construct validity and internal consistency have been reported (Miketinas, Cater, Bailey, Craft, & Tuuri, 2016), but the AMCQ has not been evaluated for test-retest reliability of intrinsic motivation. This useful measure of an instrument's accuracy (Furr & Bacharach, 2013) requires a test of the correlations between factor scores across two time points (Carmines & Zeller, 1979). Test-retest reliability, however, is only useful for constructs that are stable over time (Meyer, 2010). Intrinsic motivation is relatively stable in a short time period in comparison to the remaining SDT constructs (Gottfried, Fleming, & Gottfried, 2001). Competence, relatedness, autonomy, and autonomy support are fluctuating, interrelated constructs, and therefore are not suitable for test-retest reliability (Guay, Boggiano, & Vallerand, 2001; Standage, Duda, & Ntoumanis, 2006). Rather, internal consistency measures of reliability are more appropriate for such constructs.

This paper reports on two studies conducted using the AMCQ. The objective for study 1 was to examine reliability of the AMCQ by analyzing Cronbach's alpha coefficients for the five constructs using responses from two groups and to conduct a test-retest evaluation of intrinsic motivation within a third group. The primary objective for study 2 was to examine if the instrument could measure changes in the SDT constructs as a result of participating in a nutrition-education and culinary skills-building program. Secondary objectives of study 2 were to increase food preparation at home, food safety behavior practices, nutrition knowledge, and servings of fruits, vegetables, and dairy consumed.

### **Study 1: reliability testing**

#### **Methods**

Three groups of adolescents in grades 9-12 were recruited by teachers and the primary investigators to participate. Parent consent and child assent were collected for students who were 17 years of age or younger. Adult consent was collected from the one participant who was 18 years of age. One trained investigator administered the questionnaires using a standard protocol. Students were given instruction to read the directions carefully and respond to each item honestly. The participants were not allowed to communicate with their classmates during the testing period. Responses were kept anonymous from the teachers, other students, and parents. Responses from groups 1 and 2 were used to examine internal consistency of the constructs. Group 3 was used to examine test-retest reliability of intrinsic motivation. The students in groups 1 and 2 completed the survey at one time-point while group 3 completed the survey on two occasions two weeks apart.

### **Instrument**

The AMCQ measures five constructs including: intrinsic motivation and perceived competence to prepare healthy foods, relatedness with peers in the classroom, perceived autonomy support from the instructor, and autonomy to act within class. Responses were based on a 5-point Likert-type scale (Likert, Roslow, & Murphy, 1934) and were assigned a numerical value. Responses ranged from 1 = “disagree a lot,” 2 = “disagree,” 3 = “neither agree/disagree,” 4 = “agree,” and 5 = “agree a lot.” All responses within each factor were then summated to give composite factor scores.

### **Statistical Analyses**

Descriptive information collected included: age, gender, grade level, and race/ethnicity. Cronbach’s alpha correlation coefficients were calculated as a measure of internal consistency for the constructs. Pearson’s correlation coefficients were calculated to estimate test-retest



reliability for intrinsic motivation. The analyses were performed using SAS<sup>®</sup> software (version 9.4, SAS Institute, Inc, Cary, NC, 2013). All procedures were approved by the Institutional Review Board.

## Results

Group 1 consisted of 19 African American participants (66.7% female) with a mean age of  $15.2 \pm 0.8$  years. Group 2 included 48 students (60% female) with a mean age of  $14.9 \pm 0.9$  years; the distribution of ethnicities for group 2 was: 84.4% African American, 6.7% Hispanic, and 8.9% “other.” For group 3, 50 students completed the test-retest analysis; 52% were female and the mean age of all participants was  $16.0 \pm 0.7$  years. The distribution of ethnicities for group 3 was: 72% white, 16% black, 4% Hispanic and 8% “other.”

Cronbach’s alpha coefficients for group 1 ranged from 0.826 to 0.943 and the coefficients for group 2 ranged from 0.867 to 0.926. Table 1 details the cronbach’s alpha coefficients with 95% confidence intervals for each construct. The intrinsic motivation test-retest reliability

Table 1. Cronbach's alpha ( $\alpha$ ) and 95% confidence intervals of the Adolescent Motivation to Cook Questionnaire’s constructs responses for groups 1 and 2

Construct	$\alpha$	95% Confidence Interval	
<b>Group 1 (n = 19)</b>			
Intrinsic Motivation	0.899	0.808	0.956
Perceived Competence	0.934	0.875	0.971
Autonomy Support	0.943	0.893	0.975
Relatedness	0.870	0.753	0.943
Autonomy	0.826	0.664	0.923
<b>Group 2 (n = 48)</b>			
Intrinsic Motivation	0.882	0.822	0.927
Perceived Competence	0.888	0.831	0.931
Autonomy Support	0.910	0.864	0.944
Relatedness	0.926	0.888	0.954
Autonomy	0.867	0.797	0.919

correlation coefficient for group 3 was 0.814 (95% confidence interval: 0.693, 0.891).

## **Study 2: intervention program**

### **Methods**

Two cohorts were recruited for the nutrition education and culinary-skills building program: a school semester and a summer cohort. Participants for the school semester cohort were recruited at a local high school by teachers and stakeholders in the program. Participants enrolled in the summer pilot program were recruited by community leaders, through the mail, and with fliers. The majority of participants in this study lived in low-income neighborhoods in East Baton Rouge Parish, Louisiana. Descriptive information collected included: age, gender, grade level, and race/ethnicity. All procedures were approved by the Institutional Review Board.

The nutrition education and culinary skills-building classes were delivered once weekly for six weeks. They were part of a comprehensive personal and professional development program that also included instruction in physical health and workforce readiness. The classes from the three areas were delivered on different days of the week by discipline-specific instructors from nutrition, kinesiology, and human resource education & workforce readiness; this paper discusses only the nutrition and culinary skills-building portion of the program. The nutrition education and culinary classes were delivered to the school session cohort at a public high school during regularly scheduled class periods and to the summer cohort at two different community centers. The curriculum included six lessons that promoted the key messages of the Dietary Guidelines for Americans (DGA) 2010. Each lesson included a 15-minute lecture followed by a 35-45 minute culinary skills-building lab in which the students prepared recipes that reflected the recommendations of the DGA 2010. All lessons were delivered by the same lead nutrition educator with assistance from graduate and undergraduate students. Following

each lesson, students were provided with fresh vegetables to prepare at home using the techniques learned in class. Community center leaders requested a lesson devoted to proper hydration; therefore, in the summer program, a hydration lesson plan replaced lesson six of the school curriculum. Figure 1 describes the topic and learning objectives for each of the lessons.

Lesson	Title	Learning Objectives
1	Overview of Nutritional Health	<ol style="list-style-type: none"> <li>1. State the amounts recommended by MyPlate for each of the 5 food groups.</li> <li>2. Identify foods in each of the 5 food groups.</li> <li>3. Demonstrate how to properly cut fresh fruit with appropriate cutlery.</li> <li>4. Demonstrate how to measure dry and wet ingredients.</li> <li>5. Demonstrate proper hand washing and food washing techniques.</li> </ol>
2	Energy Balance	<ol style="list-style-type: none"> <li>1. Define energy density and distinguish between high &amp; low energy dense foods.</li> <li>2. Define nutrient density and distinguish between high &amp; low nutrient dense foods.</li> <li>3. Determine calorie needs based on height, weight, age, gender, and activity level.</li> <li>4. Apply method of heat application: Sauté</li> <li>5. Demonstrate how to slice, dice, and chop.</li> <li>6. Demonstrate proper food safety technique: avoid cross-contamination.</li> </ol>
3	Foods to Reduce	<ol style="list-style-type: none"> <li>1. Recall the Dietary Guidelines message to reduce consumption of sodium, solid fat, saturated and trans-fatty acids and added sugars.</li> <li>2. Identify foods high in sodium, solid fat, saturated and trans-fatty acids and added sugars.</li> <li>3. Describe possible negative health outcomes of overconsumption of these foods.</li> <li>4. State healthy alternatives to popular foods that are high in sodium, solid fats and trans-fats and added sugars.</li> <li>5. Apply method of heat application: Pan fry</li> <li>6. Identify and demonstrate healthy methods of flavor enhancement.</li> <li>7. Demonstrate proper food safety technique: avoid cross-contamination.</li> </ol>
4	Foods to Increase	<ol style="list-style-type: none"> <li>1. Recall the Dietary Guidelines message to increase consumption of vegetables, fruits, whole grains, milk and milk products.</li> <li>2. Identify foods rich in whole grains and high in fiber compared to refined grains and low-fiber foods.</li> <li>3. Identify low-fat dairy foods and describe their role in a healthy diet.</li> </ol>

(Figure 1 continued)

		<ol style="list-style-type: none"> <li>4. Describe the protective roles of fruits and vegetables on overall health.</li> <li>5. Recognize and state the names of fresh produce.</li> <li>6. Explain the characteristics of fresh produce desirable for purchase.</li> <li>7. Demonstrate how to estimate weights of foods by using proper measurement techniques.</li> <li>8. Explain proper food storage techniques.</li> <li>9. Demonstrate proper food and cutlery safety techniques.</li> </ol>
5	Building Healthy Eating Patterns	<ol style="list-style-type: none"> <li>1. Identify barriers to making healthy food choices.</li> <li>2. Distinguish between valid and false health claims made by food and supplement producers.</li> <li>3. Apply method of heat application: sweat, sauté, and boil</li> <li>4. Prepare a recipe that uses 3 of the 5 food groups of the Dietary Guidelines while demonstrating proper food preparation and safety techniques.</li> </ol>
6*	Making Healthy Choices	<ol style="list-style-type: none"> <li>1. Explain how individual factors, environmental settings, sectors of influence, and social and cultural norms and values influence nutrition decisions.</li> <li>2. Recall personal examples of influences within each domain.</li> <li>3. Prepare a recipe that incorporates all 5 food groups of the Dietary Guidelines while demonstrating proper food preparation and safety techniques.</li> </ol>
6**	Hydration	<ol style="list-style-type: none"> <li>1. Explain why hydration is important and identify problems of inadequate hydration.</li> <li>2. Discuss the importance of beverages low in added sugars.</li> <li>3. Identify beverages that are low in added sugars.</li> </ol>
<p>Each lesson lasted between 50 – 60 minutes            * Lesson delivered to students enrolled in the high-school-based program            **Lesson delivered to students enrolled in the summer enrichment program</p>		

Figure 1. Lesson titles and learning objectives for the nutrition education curriculum designed to improve adolescents' intrinsic motivation and perceived competence to cook healthy foods

The curriculum format directly addressed each of the psychological needs described by the SDT with the exception of autonomy, which had to be indirectly addressed by building an autonomy-supportive environment. Perceived competence was targeted each week through teaching and reinforcing food preparation skills to students. Relatedness was addressed by placing the students in groups where they had to delegate and coordinate tasks to complete the assigned recipes. An autonomy-supportive environment was cultivated by interacting with the

students before and after class, encouraging suggestions for edits to the recipes (e.g. inclusion/exclusion of ingredients for flavor development), and allowing the students to delegate tasks within their groups.

### **Instruments**

The psychosocial constructs of the SDT were measured using the AMCQ (Miketinas et al., 2016). This is the only known instrument for examining the psychosocial constructs of the SDT as they relate to food preparation in adolescents. All responses within each factor were then summated to give composite factor scores.

The Expanded Food and Nutrition Education Program (EFNEP) 9<sup>th</sup> - 12<sup>th</sup> Grade Nutrition Education Survey was used to measure dietary intake, food safety practice, and food insecurity (Burney, 2014). Four questions inquired about dietary intake. Questions asked how many times vegetables (not counting French fries), fruits (not counting juice), non-fat and 1% low fat milk, and sweetened drinks were consumed over the past day. These responses were based on a 5-point Likert-type scale ranging from “none,” “1 time,” “2 times,” “3 times,” and “4 + times.” Each response was accompanied by a numerical score on the questionnaire. A composite score for recommended dietary intake was calculated by adding the number of times vegetables, fruits, and milk were consumed and subtracting the number of times sweetened drinks were consumed. Four questions inquired about food safety practices. Participants were asked how often they washed their hands before cooking, washed produce before eating, checked expiration dates, and put foods back into the refrigerator within two hours of removal. These responses were based on a 5-point Likert-type scale ranging from “never,” “once in a while,” “sometimes,” “most of the time,” and “always.” Each response is accompanied by a numerical score on the questionnaire. A food safety composite score was calculated by adding the values of each of the four questions.

One question inquired about the family's food insecurity. The question was phrased: "In the last month, if your family did not have enough food, how often did you help by going to a food pantry or finding other free or low-cost food resources?" These responses were based on a 6-point Likert-type scale; responses included: "does not apply," "never," "1 time," "2 times," "3 times," and "4 or more times." Those who indicated "never" to "4 or more times" were considered to have some level of food insecurity.

Additional measurements examined included cooking frequency at home and nutrition knowledge. Cooking frequency was assessed by asking students how often they prepared foods at home the previous day. Choices for cooking frequency included: "none," "1 time," "2 times," and "3 or more times." Nutrition knowledge questions were developed and reviewed by a team of experts including registered dietitians, EFNEP agents, and professors. The nutrition knowledge questions were multiple-choice style and inquired about the key messages and recommendations of the DGA 2010. The knowledge questions were analyzed as a composite score of the percentage of correct answers.

### **Statistical Analyses**

Differences between groups were examined using Pearson's Chi-Squared tests for categorical variables and Student's t-test for continuous variables. Effect sizes were calculated using Cohen's  $d_z$  (Rosenthal, 1991). Relationships among variables were explored with Pearson's correlation coefficients. Analysis of Variance (ANOVA) was used to explore possible differences in the attitude and behavior changes between the school and the summer programs. Statistical significance was considered to be  $p < 0.05$  unless otherwise indicated. All analyses were performed using SAS<sup>®</sup> software (version 9.4, SAS Institute, Inc, Cary, NC, 2013).

### **Results**

Of the sixty-nine participants who were recruited to participate in the nutrition education and culinary skills-building pilot program, forty-seven (68%) attended at least four of the six lessons and provided data before and after enrollment. Participants were predominately female (59.6%) and African American (84.4%). There was a significant difference in racial demographics between the school and summer curricula ( $p = 0.04$ ); the school curriculum included a majority of African American participants while the summer program consisted exclusively of African American participants. At baseline, more than half of the participants reported they experienced some level of food insecurity within the past month. Participant demographics and food insecurity indicators are reported in Table 2. The behavior and attitude scores between the school-based and the summer enrichment programs did not differ with the exception of the relatedness scores ( $p = 0.017$ ).

Changes in scores for the SDT constructs, dietary intake, and food safety are reported in Table 3. To correct for multiple comparisons, the Bonferonni adjustment was used for the seven comparisons; thus, the adjusted level of significance was  $p < 0.0071$ . Significant increases in intrinsic motivation and perceived competence to cook healthy foods were observed after participating in the program. Participants in the school-based curriculum reported no change in relatedness, while those in the summer program reported a significant increase in relatedness scores ( $2.41 \pm 0.9$ ,  $p = 0.003$ ). There were no significant changes in dietary intake ( $p = 0.33$ ) or food safety practices ( $p = 0.31$ ). Lastly, nutrition knowledge did not increase from baseline to the post-program assessment ( $0.034 \pm 0.2$ ;  $p = 0.304$ ). Correlations among changes in the SDT constructs were explored and are presented in Table 4. Change in intrinsic motivation was positively associated with changes in perceived competence ( $r = 0.42$ ,  $p = 0.003$ ) autonomy ( $r = 0.42$ ,  $p = 0.004$ ) and autonomy support ( $r = 0.33$ ,  $p = 0.02$ ). Change in autonomy was positively

Table 2. Demographics of participants who completed the study

	Total (N=47)	School Curriculum (N=25)	Summer Curriculum (N=22)	p-value
	n (%)	n (%)	n (%)	
Gender				0.51
Female	28 (59.6)	16 (64.0)	12 (54.6)	
Age (y)				0.10
14	15 (32.6)	9 (36.0)	6 (28.5)	
15	20 (43.5)	13 (52.0)	7 (33.3)	
16	7 (15.2)	3 (12.0)	4 (19.1)	
17	4 (8.7)	0 (0.0)	4 (19.1)	
Race				0.04
African American	38 (84.4)	18 (72.0)	20 (100)	
Hispanic	3 (6.7)	3 (12.0)	0 (0.0)	
Other	4 (8.9)	4 (16.0)	0 (0.0)	
Food Insecurity*				0.53
Does not apply	21 (46.7)	11 (47.8)	10 (45.5)	
Never	9 (20.0)	4 (17.4)	5 (22.7)	
Once Monthly	4 (8.9)	1 (4.3)	3 (13.6)	
Twice Monthly	5 (11.1)	4 (17.4)	1 (4.6)	
Thrice Monthly	5 (11.1)	2 (8.8)	3 (13.6)	
Four or more times monthly	1 (2.2)	1 (4.3)	0 (0.0)	
* Food Insecurity Question: In the last month, if your family did not have enough food, how often did you help by going to a food pantry or finding other free or low-cost food resources?				
** Does not apply indicates that the participants' family had enough food within the past month				

associated with change in perceived competence ( $r = 0.32, p = 0.03$ ). Although change in autonomy was not related to changes in autonomy support, there was a significant association between the two constructs at post-intervention ( $r = 0.53, p = 0.0001$ ). Similarly, perceived competence was positively associated with autonomy support at post-intervention ( $r = 0.53, p = 0.0001$ ). No significant associations were observed between changes in the SDT constructs and behavior change. However, adolescents who indicated that during the past month they and their



Table 3. Change in pre-program- and post-program scores for outcome variables from the Adolescent Motivation to Cook Questionnaire and the 9<sup>th</sup> - 12<sup>th</sup> Nutrition Education Survey (n=47)

	Pre	Post	Change	Effect Size
Intrinsic Motivation	17.9 ± 3.3	20.6 ± 3.2	2.57 ± 3.3 <sup>a</sup>	0.77
Perceived Competence	17.5 ± 4.2	20.6 ± 3.3	3.1 ± 3.8 <sup>a</sup>	0.83
Autonomy	16.2 ± 2.5	16.8 ± 2.4	0.7 ± 2.8	0.22
Autonomy Support	24.2 ± 3.4	25.1 ± 3.4	0.9 ± 3.2	0.28
Relatedness	18.0 ± 4.5	19.1 ± 3.6	1.1 ± 3.6	0.31
Dietary Intake*	1.44 ± 2.5	1.0 ± 2.6	-0.4 ± 2.6	0.16
Food Safety**	17.6 ± 2.1	17.2 ± 2.8	-0.4 ± 2.5	0.14

Values are reported as mean ± standard deviation  
 To correct for multiple comparisons, the Bonferonni adjusted significance level is 0.0071  
<sup>a</sup> Significant change from pre- to post-program, p < 0.0001  
 Effect size was calculated using Cohen's  $d_z$  equation  
 \* Dietary Intake score reflects the reported intake of fruits, vegetables, and dairy products minus the consumption of sweetened beverages  
 \*\* Food Safety score reflects the reported practices of hand and food washing, checking expiration dates and care of refrigerated items.

Table 4.  
 Correlations among changes in constructs from the Adolescent Motivation to Cook Questionnaire

	1	2	3	4	5
1. Intrinsic Motivation	1.00	0.42**	0.33*	0.14	0.42**
2. Perceived Competence		1.00	0.19	0.05	0.32*
3. Autonomy			1.00	0.07	0.28
4. Autonomy Support				1.00	0.11
5. Relatedness					1.00

Changes in the constructs were calculated by subtracting the pre-score from the post-score  
 \* p < 0.05, \*\*p < 0.01

family had sought food from a free or low-cost resource reported a greater change in intrinsic motivation to prepare healthy foods compared to those who indicated no food insecurity ( $4.07 \pm 3.1$  vs.  $1.87 \pm 3.2$ ;  $p = 0.031$ ). No difference was seen in baseline intrinsic motivation scores between food secure and food insecure adolescents ( $18.2 \pm 3.1$  vs.  $17.9 \pm 3.5$ ;  $p = 0.76$ ).

## **Discussion**

Study 1 provides evidence for acceptable internal consistency of the AMCQ constructs (Nunnally & Bernstein, 1994) and intrinsic motivation's test-retest reliability (Colton & Colvert, 2007). Further, study 2 provides evidence that the AMCQ is able to measure change in intrinsic motivation and perceived competence to prepare healthy foods as a result of participating in a nutrition education and culinary skills-building program.

Test-retest reliability can be a useful analysis for evaluating construct stability of static constructs; however, when constructs are expected to change over time, the correlation coefficients will likely be smaller because of the increased variation (Meyer, 2010). It was expected that intrinsic motivation to prepare healthy foods would be a relatively stable construct as opposed to perceived competence, relatedness, autonomy and autonomy support.

Chronbach's alpha is therefore a useful statistic for estimating the reliability of constructs that are expected to change. The AMCQ Cronbach's alpha scores observed in this study are comparable to the scores previously reported by this research group (Miketinas et al., 2016).

The associations between perceived competence, relatedness, and autonomy with intrinsic motivation observed in the present study are in congruence with the relationships proposed by the SDT (Ryan, & Deci, 2000; Deci, & Ryan, 2008). There was a positive association between autonomy support at post-intervention and improvements in perceived competence and intrinsic motivation. These associations are consistent with the findings from Black & Deci (2000) in which organic chemistry students reported greater perceived competence and interest/enjoyment in the class when they perceived their teacher to be autonomy supportive. While the relationships between the constructs are consistent with the SDT and with previous

research, more sophisticated analyses, such as structural equation modeling, need to be performed to understand the structure of the interrelationships.

This study did not find an association between changes in IM and PC to prepare healthy foods and reported food preparation frequency at home. Food preparation at home did not increase from baseline in this group of adolescents; other cooking programs with youth have reported similar findings (Beets et al., 2007; Cheesen, 2008). Lack of time is frequently reported as a barrier to cooking along with a perceived lack of food preparation skills and the ease of convenience foods (Rasmussen et al., 2006; Krølner et al., 2011; Lavelle et al., 2016). Students in this study reported that time constraints (e.g. homework, work, and extracurricular conflicts) and lack of permission from their parents or guardians to use the kitchen were barriers to home food preparation. Cooking programs that have targeted these barriers have failed to overcome them despite reporting improvements in self-efficacy to cook at home (Cheesen, 2008). Culinary skills-building programs may not be able to improve adolescents' home meal preparation without overcoming barriers to home meal preparation.

Dietary intake, food safety practices, and nutrition knowledge did not change significantly from baseline in the program participants. The EFNEP questionnaire has not been evaluated as measure of diet quality or food safety, rather its questions address specific goals identified by the organization. Although the curriculum addressed the knowledge questions, it is unclear why significant improvements in knowledge scores were not observed. While some programs have reported increases in nutrition knowledge (O'Neil & Nicklas, 2002; Beets et al., 2007), others have not (Brown & Hermann, 2005; Chesson 2009).

Previous research has suggested that food insecure youth do not appreciate healthy eating and consume family meals less often compared to food-secure youth (Widome, Neumark-

Sztainer, Hannan, Haines, & Story, 2009; Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003). The present study found that students who indicated some level of food insecurity and who had helped their family procure food from a reduced-cost source reported greater intrinsic motivation to prepare healthy foods compared to students who did not help or reported no food insecurity. Although the EFNEP question regarding food insecurity has not been compared to other validated measures, these results suggest that the skills and motivation to prepare healthy foods are valued by food insecure individuals who are involved in the meal-planning process.

This pilot program had several limitations. The program's effectiveness could not be compared with a control group. In addition, the content of the sixth curriculum lesson differed between the school-based and summer programs. However, when the students' AMCQ scores were compared from those enrolled in the school-based program to those in the summer program, they differed only by reported changes in relatedness. Additionally, the cooking frequency question asked participants to indicate how often they prepared food only over the past 24 hours and it may not have accurately captured usual food preparation habits.

This study testing the AMCQ suggests that the questionnaire has test-retest reliability and is able to detect changes in the theory constructs as they apply to cooking foods recommended by the DGA 2010. These findings also suggest that the theory constructs are interrelated in accordance with the SDT. The AMCQ offers a consistent measurement tool that can be used to evaluate the impact of participating in nutrition education and culinary skills-building programs on adolescents' intrinsic motivation and perceived competence to cook healthy foods. The application of the SDT as the guiding theory for such nutrition and cooking programs is in its infancy; however, the associations among the psychosocial constructs observed in this study reflect the SDT theoretical framework thereby supporting its use in this setting.



## **CHAPTER 5**

### **SUMMARY AND CONCLUSIONS**

Initial testing of the AMCQ provides evidence of its construct validity using responses from a geographically diverse sample of high school students in Louisiana. As hypothesized, the EFA identified five latent constructs whose respective manifest variables are consistent with the psychological constructs described by the SDT. Further, the CFA provided support of adequate model fit for the hypothesized five-factor model compared to a single-factor model. Additional criteria (e.g. RMSEA & SRMR) for the five-factor model met independent recommendations for model fit (Hu & Bentler 1999; Geiser, 2013). Although CFI and TLI fit indices were slightly lower than the suggested 0.95 criteria (Hu & Bentler, 1999) for the five-factor model, they were considerably greater than the values for the single factor. Cronbach's alpha coefficients demonstrated each acceptable internal consistency ( $\alpha > 0.70$ ) for each factor. While the large sample size and geographical diversity were strengths of these analyses, the AMCQ required further testing in underrepresented racial groups; therefore, reliability measures were conducted using responses from predominantly African American high school students. In two separate samples, the AMCQ demonstrated adequate internal consistency for all five factors. Additionally, test-retest analysis demonstrated IM's stability over a two-week period ( $r > 0.80$ ).

Lastly, participants who participated in a nutrition education and culinary skills-building program reported significant increases in IM and PC to cook as hypothesized. Greater improvements in IM were reported by food insecure adolescents who were involved in their family's food procurement process compared to those who were not involved or reported no food insecurity. These findings suggest food insecure youth are more receptive to culinary skills-building programs compared to food secure youth. Previous studies have reported that food insecure adolescents do not appreciate healthy eating and consume meals at home less frequently

compared to food-secure youth (Neumark-Sztainer et al., 2003; Widome et al., 2009). These associations may not be for a lack of interest in healthy eating, but rather, a lack of nutrition and culinary education. Relationships were observed between the five psychosocial constructs that are consistent with the SDT (Deci & Ryan, 2008). As expected, changes in PC, relatedness, and autonomy scores were positively associated with changes in IM.

Secondary objectives of this study were to increase adolescents' reported home food preparation frequency, consumption of fruits and vegetables, nutrition knowledge, and food safety behaviors were not achieved. Significant differences may not have been captured because of the limited, 24-hr time frame captured by the testing instruments. Upon further development of the curriculum, an inclusion of a control group, and a refinement of the testing instruments, this program has the potential to positively influence healthy attitudes and behaviors of high school adolescents.

Additional studies are needed to further develop the AMCQ. While the results from this pilot program are encouraging, more sophisticated multivariate analyses such as structural equation modeling and path analyses are needed to test the theory-based relationships between constructs. Further, the AMCQ needs to be tested for convergent validity; for example, IM scores need to be compared to home food preparation frequency and PC scores could be compared to independent measures of cooking competency.

The AMCQ has the potential to be used as an evaluation tool for nutrition education and culinary skills-building programs guided by the SDT. Nutrition education and culinary skills building programs as a whole lack a unified behavioral-change theory, and consistent outcome measures and instruments. Therefore, the strength of the evidence regarding their efficacy in positively influencing healthy behaviors is lacking. If the AMCQ were used to evaluate the

effectiveness of future nutrition education and culinary skills-building programs, this instrument could provide consistency between interventions, allowing for better conclusions to be drawn regarding their efficacy.



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# APPENDIX I PERMISSIONS

1/10/2017

Gmail - Copyright release request (Miketinas)



Derek DHA <dmiket11@gmail.com>

## Copyright release request (Miketinas)

3 messages

dmiket11@gmail.com <dmiket11@gmail.com>

Sat, Jan 7, 2017 at 12:52 PM

To: "permissionshelpdesk@elsevier.com" <permissionshelpdesk@elsevier.com>

Cc: "gtuuri@agcenter.lsu.edu" <gtuuri@agcenter.lsu.edu>

Good afternoon,

The article, "Exploratory and confirmatory factor analysis of the Adolescent Motivation to Cook Questionnaire: A Self-Determination Theory instrument" published in the journal of Appetite is a part of my dissertation for the Doctoral program in Human Nutrition at Louisiana State University. I am writing to request a copyright release from Elsevier so I can use the manuscript in my thesis. I am the first author on the paper and will be defending my dissertation in March 2017.

Please let me know if there is anything I need to do to obtain permission to use the article.

Thank you in advance for your time and help,

Derek Miketinas

Permissions Helpdesk <permissionshelpdesk@elsevier.com>

Mon, Jan 9, 2017 at 9:19 AM

To: "dmiket11@gmail.com" <dmiket11@gmail.com>

Cc: "gtuuri@agcenter.lsu.edu" <gtuuri@agcenter.lsu.edu>

Dear Derek,

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1/10/2017

Gmail - Copyright release request (Miketinas)

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Best of luck with your thesis and best regards,

Laura

**Laura Stingelin**

Permissions Helpdesk Associate

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Contact the Permissions Helpdesk

+1 800-523-4069 x3808 | permissionshelpdesk@elsevier.com

**From:** dmiket11@gmail.com [mailto:dmiket11@gmail.com]

**Sent:** Saturday, January 07, 2017 1:52 PM

**To:** Permissions Helpdesk

**Cc:** gtuum@agcenter.lsu.edu

**Subject:** Copyright release request (Miketinas)

[Quoted text hidden]

Derek DHA <dmiket11@gmail.com>

Tue, Jan 10, 2017 at 1:10 PM

To: Permissions Helpdesk <permissionshelpdesk@elsevier.com>

Thank you Laura, I really appreciate your help!

Sincerely,  
Derek Miketinas

[Quoted text hidden]

<https://mail.google.com/mail/u/0/?ui=2&ik=f9d3b4a5e2&view=pt&search=inbox&th=1597a4a965e8bc06&siml=1597a4a965e8bc06&siml=15983d08b0d9e4c7&si...> 2/2

## APPENDIX II INSTITUTIONAL REVIEW BOARD APPROVAL



LSU AgCenter Institutional Review Board (IRB)  
 Dr. Michael J. Keenan, Chair  
 School of Human Ecology  
 209 Knapp Hall  
 225-578-1708  
 mkeenana@agctr.lsu.edu

### Application for Exemption from Institutional Oversight

All research projects using living humans as subjects, or samples or data obtained from humans must be approved or exempted in advance by the LSU AgCenter IRB. This form helps the principal investigator determine if a project may be exempted, and is used to request an exemption.

- Applicant, please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the LSU AgCenter IRB. Once the application is completed, please submit the original and one copy to the chair, Dr. Michael J. Keenan, in 209 Knapp Hall.
- A Complete Application Includes All of the Following:
  - (A) The original and a copy of this completed form and a copy of parts B through E.
  - (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1 & 2)
  - (C) Copies of all instruments and all recruitment material to be used.
    - If this proposal is part of a grant proposal, include a copy of the proposal.
  - (D) The consent form you will use in the study (see part 3 for more information)
  - (E) Beginning January 1, 2009: Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing and handling data, unless already on file with the LSU AgCenter IRB.  
 Training link: (<http://grants.nih.gov/grants/policy/hs/training.htm>)

1) Principal Investigator: Derek Mketinas Rank: \_\_\_\_\_ Student?  Y  N  
 Dept: Human Ecology Ph: 228 239 4713 E-mail: dmiket1@lsu.edu

2) Co-Investigator(s): Please include department, rank, phone and e-mail for each  
 • If student as principal or co-investigator(s), please identify and name supervising professor in this space  
Dr. Georgianna Tuuri

3) Project Title: Validation of a Questionnaire to Assess Adolescents' Motivation to Prepare Healthy Food

4) Grant Proposal? (yes or no) NO If Yes, Proposal Number and funding Agency \_\_\_\_\_  
 Also, if Yes, either: this application completely matches the scope of work in the grant Y/N \_\_\_\_\_

OR  
 more IRB applications will be filed later Y/N \_\_\_\_\_

5) Subject pool (e.g. Nutrition Students) Highschool Students blw ages 13-19  
 • Circle any "vulnerable populations" to be used: (children < 18) the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI signature Derek M \*\*Date 8/20/14 (no per signatures)  
 \*\*I certify that my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU AgCenter institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at the LSU AgCenter for three years after completion of the study. If I leave the LSU AgCenter before that time the consent forms should be preserved in the Departmental Office.

Committee Action: Exempted  Not Exempted \_\_\_\_\_ IRB# HE14-10

Reviewer Michael Keenan Signature Michael Keenan Date 8-26-2014

**Part 1: Determination of “Research” and Potential for Risk**

- This section determines whether the project meets the Department of Health and Human Services (HHS) definition of research involving human subjects, and if not, whether it nevertheless presents more than “minimal risk” to human subjects that makes IRB review prudent and necessary.

**1. Is the project involving human subjects a systematic investigation, including research, development, testing, or evaluation, designed to develop and contribute to generalizable knowledge?**

(Note some instructional development and service programs will include a “research” component that may fall within HHS’ definition of human subject research)

**Yes**

**No**

**2. Does the project present physical, psychological, social or legal risks to the participants reasonably expected to exceed those risks normally experienced in daily life or in routine physical or psychological examination or testing?**

You must consider the consequences if individual data inadvertently become public.

**Yes Stop.** This research cannot be exempted—**submit application for full IRB review.**

**No Continue** to see if research can be exempted from IRB oversight.

**3. Are any of your subjects incarcerated?**

**Yes Stop.** This research cannot be exempted—**submit application for full IRB review.**

**No Continue** to see if research can be exempted from IRB oversight.

**4. Are you obtaining any health information from a health care provider that contains any of the identifiers listed below?**

A. Names

B. Address: street address, city, county, precinct, ZIP code, and their equivalent geocodes. Exception for ZIP codes: the initial three digits of the ZIP code may be used, if according to current publicly available data from the Bureau of the Census: (1) The geographic unit formed by combining all ZIP codes with the same three initial digits contains more than 20,000 people; and (2) the initial three digits of a ZIP code for all such geographic units containing 20,000 or fewer people is changed to ‘000.’ (Note: The 17 currently restricted 3-digit ZIP codes to be replaced with ‘000’ include: 036, 059, 063, 102, 203, 556, 692, 790, 821, 823, 830, 831, 878, 879, 884, 890, and 893.)

- C. Dates related to individuals
  - a. Birth date
  - b. Admission date
  - c. Discharge date
  - d. Date of death
  - e. And all ages over 89 and all elements of dates (including year) indicative of such age. Such ages and elements may be aggregated into a single category of age 90 or older
- D. Telephone numbers;
- E. Fax numbers;
- F. Electronic mail addresses;
- G. Social security numbers;
- H. Medical record numbers (including prescription numbers and clinical trial numbers);
- I. Health plan beneficiary numbers;
- J. Account numbers;
- K. Certificate/license numbers;
- L. Vehicle identifiers and serial numbers including license plate numbers;
- M. Device identifiers and serial numbers;
- N. Web Universal Resource Locators (URLs);
- O. Internet Protocol (IP) address numbers;
- P. Biometric identifiers, including finger and voice prints;
- Q. Full face photographic images and any comparable images;
- R. Any other unique identifying number, characteristic, or code; except a code used for re-identification purposes and;
- S. The facility does not have actual knowledge that the information could be used alone or in combination with other information to identify an individual who is the subject of the information

**Yes Stop.** This research cannot be exempted—**submit application for full IRB review.**

**No Continue** to see if research can be exempted from IRB oversight.

**Part 2: Exemption Criteria for Research Projects Can be found on the Next Page.**

**Part 2: Exemption Criteria for Research Projects**

Please select any and all categories that relate to your research. Research is exemptible when all research methods are one or more of the following five categories. Check statements that apply to your study:

-----

1. In education setting, research to evaluate normal educational practices.

-----

2. For research not involving vulnerable people [prisoner, fetus, pregnancy, children, or mentally impaired]: that observes public behavior (including participatory observation), or with interviews or surveys or educational tests:

The research must also comply with ONE of the following:

a) The participants cannot be identified, directly or statistically;

or that

b) The responses/observations could not harm participants if made public;

or that

c) Federal statute(s) completely protect all participants' confidentiality.

-----

3. For research not involving vulnerable people [prisoner, fetus, pregnancy, children, or mentally impaired]: that observes public behavior (including participatory observation), or with interviews or surveys or educational tests:

All respondents are elected, appointed, or candidates for public offices.

-----

4. Uses only existing data , documents, records, or specimens properly obtained.

The research must also comply with ONE of the following:

a) Subjects cannot be identified in the research data directly or statistically, and no one can trace back from research data to identify a subject;

or that

b) The sources are publicly available



-----  
\_\_\_\_ 5. Research or demonstration service/care programs, e.g. health care delivery.

The research must also comply with ALL of the following:

\_\_\_ a) It is directly conducted or approved by the head of a US Government department or agency;

and that

\_\_\_ b) It concerns only issues under usual administrative control (48 Fed Reg 9268-9), e.g. regulations, eligibility, services, or delivery systems;

and that

\_\_\_ c) Its research/evaluation methods are also exempt from IRB review.

-----

\_\_\_\_ 6. For research not involving vulnerable people [prisoner, fetus, pregnancy, or mentally impaired; Note that children can participate for an exempt study]: with food to evaluate quality, taste, or consumer acceptance.

The research must also comply with ONE of the following:

\_\_\_ a) The food has no additives;

or that

\_\_\_ b) The food is certified safe by the USDA, FDA or EPA.

**Part 3: Consent Form Information  
Can be Found on the Next Page.**

### Part 3: Information on Consent Forms

- The consent form must be written in non-technical language which can be understood by the subjects. It should be free of any exculpatory language through which the subject is made to waive, or appears to be made to waive any legal rights, including any release of the investigator(s), sponsor, institution or its agents from liability for negligence. (Note: the consent form is not a contract)
- For example consent forms, please refer to the LSU campus IRB website, [http://www.lsu.edu/irb\\_researchers.shtml](http://www.lsu.edu/irb_researchers.shtml)
- The LSU AgCenter IRB prefers using signed informed consent. However, if that is impractical, an application to waive signed consent can be requested below. When this waiver is requested, the **LSU AgCenter IRB must be provided with the consent script** that will present the information about consent to human subjects regarding the study/research. All consent forms or scripts must include a statement that the study was approved by the LSU AgCenter IRB and provide LSU AgCenter IRB contact information to participants: Dr. David Morrison at 225-578-4182. **Note: Parental consent usually cannot be waived for studies with children as subjects.**

#### I am requesting waiver of **SIGNED** Informed Consent because:

\_\_\_ (a) Having a participant sign the consent form would create the **principal risk** of participating in the study

**or that**

\_\_\_ (b) The research presents **no more than minimal risk** of harm to subjects and involves no procedures for which having signed consent is normally required outside of the research environment.

Now that your application is complete, please send two copies of it to the LSU AgCenter IRB for review, at the address listed below.



LSU AgCenter Institutional Review Board  
Dr. Michael J. Keenan, Chair  
209 Knapp Hall  
Baton Rouge, LA 70803  
Ph: 225-578-1708  
Fax: 225-578-4443  
E-mail: [mkeenan@agctr.lsu.edu](mailto:mkeenan@agctr.lsu.edu)

IRB# \_\_\_\_\_ APPROVED BY  
LSU AG CENTER  
IRB AS # HE 14-10  
ON 8-26-2014

**CONSENT FOR CHILD TO COMPLETE THE  
Motivation to Prepare Healthy Foods Safely Questionnaire**  
Parent Consent Form

Dear Parent or Caregiver,

Will you let your child complete a short questionnaire?

This questionnaire should take less than five minutes to complete and will help us find out how motivated people are to prepare healthy foods. There is no cost to you or the child and participation is voluntary. **Your child's responses will remain confidential to researchers and school faculty.**

If you have any questions you can contact either one of the following investigators:

Derek C. Miketinas, BS Graduate Student School of Nutrition and Food Sciences Email: dmiket1@lsu.edu	Georgianna Tuuri, PhD, LDN, RD Associate Professor of Nutrition School of Nutrition and Food Sciences Phone: 225-578-1722
---	--

The study has been explained to me and all of my questions have been answered. I may direct additional questions regarding program specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dr. Phil H. Elzer, Associate Vice Chancellor & Associate Director, LSU AgCenter, (225) 578-4182. I will allow my child to complete the certificate described on the back of this page and acknowledge the investigators' obligation to provide me with a signed copy of this consent form.

Parent's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Information about your child:**

Name: \_\_\_\_\_ (please print)

Gender: \_\_\_\_\_ Grade: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_

Please provide us with your email address in case we need to contact you:

Email: \_\_\_\_\_

APPROVED BY  
IRB# \_\_\_\_\_ LSU AG CENTER  
IRB AS HEIF-10  
ON 8-26-2014

### Description of the Program

**Project Title:** "Validation of a Survey to Assess Adolescents' Motivation to Prepare Healthy Foods"

**Investigators:** The following investigators are available for questions, M-F 8:00 am-4:30 p.m.

Derek C. Miketinas, BS	Georgianna Tuuri, PhD, LDN, RD
Graduate Student	Associate Professor of Nutrition
School of Nutrition and Food Sciences	School of Nutrition and Food Sciences
Email: dmiket1@lsu.edu	Phone: 225-578-1722

**Purpose of the Program:** To assess adolescents' motivation to prepare healthy foods.

**Inclusion Criteria:** Youth 13 to 19 years of age.

**Exclusion Criteria:** People who are younger than 13 years or older than 19 years of age.

**Description of the Program:** Before participating, students 13-17 years old will complete an assent form and students who are 18 or 19 years old will complete a consent form. After the appropriate, required form is completed, the student will anonymously complete the questionnaire. The questionnaire will take approximately five minutes to complete.

**Benefit:** You will help researchers learn more about motivation to cook healthy foods.

**Risks:** There are no known risks involved

**Right to Refuse:** Participation is voluntary. You may withdraw yourself from the program at any time.

**Privacy:** Results of the scores may be published, but no names or identifying information will be included for publication. All responses will remain anonymous to the researchers and school faculty. A student's identity will remain confidential unless disclosure is required by law.

**Financial Information:** There is no cost to complete this program.

APPROVED BY  
IRB# \_\_\_\_\_ LSU AG CENTER  
IRB AS HE14-10  
ON 8-26-2014

**CONSENT TO TAKE A QUESTIONNAIRE**  
Adult Consent Form

Dear student,

We would like to better understand students' motivation to prepare healthy foods. We have developed a questionnaire which aims to assess a student's motivation to prepare healthy foods. The questionnaire will take less than five minutes to complete and will be administered. This will be provided at no cost to the student and participation is voluntary. **Your responses will remain confidential to researchers and school faculty.**

If you have any questions you can contact either one of the following investigators:

Derek C. Miketinas, BS Graduate Student School of Nutrition and Food Sciences Email: dmiket1@lsu.edu	Georgianna Tuuri, PhD, LDN, RD Associate Professor of Nutrition School of Nutrition and Food Sciences Phone: 225-578-1722
---	--

The questionnaire has been explained to me and all of my questions have been answered. I may direct additional questions regarding program specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dr. Phil H. Elzer, Associate Vice Chancellor & Associate Director, LSU AgCenter, (225) 578-4182. I will consent to described on the back of this page and acknowledge the investigators' obligation to provide me with a signed copy of this consent form.

Your Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Information about you:

Name: \_\_\_\_\_ (please print)

Gender: \_\_\_\_\_ Grade: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_

Please provide us with your email address in case we need to contact you:

Email: \_\_\_\_\_

IRB# APPROVED BY  
LSU AG CENTER  
IRB AS HE14-10  
ON 8-26-2014

#### Description of the Program

**Project Title:** "Validation of a Survey to Assess Adolescents' Motivation to Prepare Healthy Foods"

**Investigators:** The following investigators are available for questions, M-F 8:00 am-4:30 p.m.

Derek C. Miketinas, BS	Georgianna Tuuri, PhD, LDN, RD
Graduate Student	Associate Professor of Nutrition
School of Nutrition and Food Sciences	School of Nutrition and Food Sciences
Email: dmiket1@lsu.edu	Phone: 225-578-1722

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**Benefit:** You will help researchers learn more about motivation to cook healthy foods.

**Risks:** There are no known risks involved

**Right to Refuse:** Participation is voluntary. You may withdraw yourself from the program at any time.

**Privacy:** Results of the scores may be published, but no names or identifying information will be included for publication. All responses will remain anonymous to the researchers and school faculty. A student's identity will remain confidential unless disclosure is required by law.

**Financial Information:** There is no cost to complete this program.

APPROVED BY  
LSU AG CENTER  
IRB# \_\_\_\_\_  
IRB AS HE14-10  
ON 8-26-2014

**ASSENT TO COMPLETE A QUESTIONNAIRE**  
Youth Assent Form

Name of Principal Investigator: Derek Miketinas, BS (225-578-1722)  
Name of Co-Investigator: Georgianna Tuuri, PhD, RD, LDN (225-578-1722)

**Name of the Program:** "Validation of a Questionnaire to Assess Adolescents' Motivation to Prepare Healthy Foods"

**Why are they doing this survey?**

To better understand students' motivation to prepare healthy foods.

**What will happen to me?**

If I want to participate, the following things will happen:

- I will complete the Motivation to Prepare Healthy Foods Questionnaire.
- **My name will not be written on the questionnaire, so the researchers and school faculty will not know how I respond.**

**What if I have questions?**

I can ask questions at any time.

**Do I have to be in the program?**

I don't have to participate if I choose not to.

-----  
I, \_\_\_\_\_, agree to complete the Motivation to Prepare Healthy Foods Questionnaire provided by the teachers from Louisiana State University.

\_\_\_\_\_  
Adolescent Signature

\_\_\_\_\_  
Age

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness\*

\_\_\_\_\_  
Date

\*Witness must be present for the assent process, not just for the signature by the minor.



LSU AgCenter Institutional Review Board (IRB)  
 Dr. Michael J. Keenan, Chair  
 School of Human Ecology  
 209 Knapp Hall  
 225-578-1708  
 mkeenana@agctr.lsu.edu

**Application for Exemption from Institutional Oversight**

All research projects using living humans as subjects, or samples or data obtained from humans must be approved or exempted in advance by the LSU AgCenter IRB. This form helps the principal investigator determine if a project may be exempted, and is used to request an exemption.

- Applicant, please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the LSU AgCenter IRB. Once the application is completed, please submit the original and one copy to the chair, Dr. Michael J. Keenan, in 209 Knapp Hall.
- A Complete Application Includes All of the Following:
  - (A) The original and a copy of this completed form and a copy of parts B through E.
  - (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1 & 2)
  - (C) Copies of all instruments and all recruitment material to be used.
    - If this proposal is part of a grant proposal, include a copy of the proposal.
  - (D) The consent form you will use in the study (see part 3 for more information)
  - (E) Beginning January 1, 2009: Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing and handling data, unless already on file with the LSU AgCenter IRB.  
 Training link: (<http://grants.nih.gov/grants/policy/hs/training.htm>)

1) Principal Investigator: Georgianna Tuuri Rank: Associate Professor Student? Y/N   
 Dept: Human Ecology Ph: 578-1722 E-mail: gtuuri@agcenter.lsu.edu

2) Co-Investigator(s): please include department, rank, phone and e-mail for each  
 • If student as principal or co-investigator(s), please identify and name supervising professor in this space: Graduate Student: Derek Miketinas; Supervising Professor: Georgianna Tuuri

3) Project Title: Wellness Ambassador Program

4) Grant Proposal?(yes or no) yes If Yes, Proposal Number and funding agency: Kellogg Foundation  
 Also, if Yes, either: this application completely matches the scope of work in the grant Y/N Y  
 OR  
 more IRB applications will be filed later Y/N    

5) Subject pool (e.g. Nutrition Students) High School Students at Glen Oaks High School  
 • Circle any "vulnerable populations" to be used: (children<18, the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI signature Georgianna Tuuri \*\*Date 7/29/13 (no per signatures)  
 \*\*I certify that my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU AgCenter institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at the LSU AgCenter for three years after completion of the study. If I leave the LSU AgCenter before that time the consent forms should be preserved in the Departmental Office.

Committee Action: Exempted  Not Exempted  IRB# HE13-9

Reviewer Michael Keenan Signature Michael Keenan Date 7-29-2013



**Part 1: Determination of “Research” and Potential for Risk**

- This section determines whether the project meets the Department of Health and Human Services (HHS) definition of research involving human subjects, and if not, whether it nevertheless presents more than “minimal risk” to human subjects that makes IRB review prudent and necessary.

**1. Is the project involving human subjects a systematic investigation, including research, development, testing, or evaluation, designed to develop and contribute to generalizable knowledge?**

(Note some instructional development and service programs will include a “research” component that may fall within HHS’ definition of human subject research)

**Yes**

**No**

**2. Does the project present physical, psychological, social or legal risks to the participants reasonably expected to exceed those risks normally experienced in daily life or in routine physical or psychological examination or testing?**

You must consider the consequences if individual data inadvertently become public.

**Yes Stop.** This research cannot be exempted—**submit application for full IRB review.**

**No Continue** to see if research can be exempted from IRB oversight.

**3. Are any of your subjects incarcerated?**

**Yes Stop.** This research cannot be exempted—**submit application for full IRB review.**

**No Continue** to see if research can be exempted from IRB oversight.

**4. Are you obtaining any health information from a health care provider that contains any of the identifiers listed below?**

A. Names

B. Address: street address, city, county, precinct, ZIP code, and their equivalent geocodes. Exception for ZIP codes: the initial three digits of the ZIP code may be used, if according to current publicly available data from the Bureau of the Census: (1) The geographic unit formed by combining all ZIP codes with the same three initial digits contains more than 20,000 people; and (2) the initial three digits of a ZIP code for all such geographic units containing 20,000 or fewer people is changed to ‘000.’ (Note: The 17 currently restricted 3-digit ZIP codes to be replaced with ‘000’ include: 036, 059, 063, 102, 203, 556, 692, 790, 821, 823, 830, 831, 878, 879, 884, 890, and 893.)

- C. Dates related to individuals
  - a. Birth date
  - b. Admission date
  - c. Discharge date
  - d. Date of death
  - e. And all ages over 89 and all elements of dates (including year) indicative of such age. Such ages and elements may be aggregated into a single category of age 90 or older
- D. Telephone numbers;
- E. Fax numbers;
- F. Electronic mail addresses;
- G. Social security numbers;
- H. Medical record numbers (including prescription numbers and clinical trial numbers);
- I. Health plan beneficiary numbers;
- J. Account numbers;
- K. Certificate/license numbers;
- L. Vehicle identifiers and serial numbers including license plate numbers;
- M. Device identifiers and serial numbers;
- N. Web Universal Resource Locators (URLs);
- O. Internet Protocol (IP) address numbers;
- P. Biometric identifiers, including finger and voice prints;
- Q. Full face photographic images and any comparable images;
- R. Any other unique identifying number, characteristic, or code; except a code used for re-identification purposes and;
- S. The facility does not have actual knowledge that the information could be used alone or in combination with other information to identify an individual who is the subject of the information

**Yes Stop.** This research cannot be exempted—**submit application for full IRB review.**

**No Continue** to see if research can be exempted from IRB oversight.

**Part 2: Exemption Criteria for Research Projects Can be found on the Next Page.**



LSU AgCenter Institutional Review Board (IRB)  
 Dr. Michael J. Keenan, Chair  
 School of Human Ecology  
 209 Knapp Hall  
 225-578-1708  
 mkeenana@agctr.lsu.edu

**Application for Exemption from Institutional Oversight**

All research projects using living humans as subjects, or samples or data obtained from humans must be approved or exempted in advance by the LSU AgCenter IRB. This form helps the principal investigator determine if a project may be exempted, and is used to request an exemption.

- Applicant, please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the LSU AgCenter IRB. Once the application is completed, please submit the original and one copy to the chair, Dr. Michael J. Keenan, in 209 Knapp Hall.
- A Complete Application Includes All of the Following:
  - (A) The original and a copy of this completed form and a copy of parts B through E.
  - (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1 & 2)
  - (C) Copies of all instruments and all recruitment material to be used.
    - If this proposal is part of a grant proposal, include a copy of the proposal.
  - (D) The consent form you will use in the study (see part 3 for more information)
  - (E) Beginning January 1, 2009: Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing and handling data, unless already on file with the LSU AgCenter IRB.  
 Training link: (<http://grants.nih.gov/grants/policy/hs/training.htm>)

1) Principal Investigator: Georgianna Tuuri Rank: Associate Professor Student? Y/N   
 Dept: Human Ecology Ph: 578-1722 E-mail: gtuuri@agcenter.lsu.edu

2) Co-Investigator(s): please include department, rank, phone and e-mail for each  
 • If student as principal or co-investigator(s), please identify and name supervising professor in this space: Graduate Student: Derek Miketinas; Supervising Professor: Georgianna Tuuri

3) Project Title: Wellness Ambassador Program

4) Grant Proposal?(yes or no) yes If Yes, Proposal Number and funding agency: Kellogg Foundation  
 Also, if Yes, either: this application completely matches the scope of work in the grant Y/N   
 OR  
more IRB applications will be filed later Y/N

5) Subject pool (e.g. Nutrition Students) High School Students at Glen Oaks High School  
 • Circle any "vulnerable populations" to be used: (children<18, the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI signature Georgianna Tuuri \*\*Date 7/29/13 (no per signatures)  
 \*\*I certify that my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU AgCenter institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at the LSU AgCenter for three years after completion of the study. If I leave the LSU AgCenter before that time the consent forms should be preserved in the Departmental Office.

Committee Action: Exempted  Not Exempted  IRB# HE13-9

Reviewer Michael Keenan Signature Michael Keenan Date 7-29-2013

**Part 2: Exemption Criteria for Research Projects**

Please select any and all categories that relate to your research. Research is exemptible when all research methods are one or more of the following five categories. Check statements that apply to your study:

-----

1. In education setting, research to evaluate normal educational practices.

-----

2. For research not involving vulnerable people [prisoner, fetus, pregnancy, children, or mentally impaired]: that observes public behavior (including participatory observation), or with interviews or surveys or educational tests:

The research must also comply with ONE of the following:

a) The participants cannot be identified, directly or statistically;

or that

b) The responses/observations could not harm participants if made public;

or that

c) Federal statute(s) completely protect all participants' confidentiality.

-----

3. For research not involving vulnerable people [prisoner, fetus, pregnancy, children, or mentally impaired]: that observes public behavior (including participatory observation), or with interviews or surveys or educational tests:

All respondents are elected, appointed, or candidates for public offices.

-----

4. Uses only existing data , documents, records, or specimens properly obtained.

The research must also comply with ONE of the following:

a) Subjects cannot be identified in the research data directly or statistically, and no one can trace back from research data to identify a subject;

or that

b) The sources are publicly available

-----  
\_\_\_\_ 5. Research or demonstration service/care programs, e.g. health care delivery.

The research must also comply with ALL of the following:

\_\_\_ a) It is directly conducted or approved by the head of a US Government department or agency;

and that

\_\_\_ b) It concerns only issues under usual administrative control (48 Fed Reg 9268-9), e.g. regulations, eligibility, services, or delivery systems;

and that

\_\_\_ c) Its research/evaluation methods are also exempt form IRB review.

-----

\_\_\_\_ 6. For research not involving vulnerable people [prisoner, fetus, pregnancy, or mentally impaired; Note that children can participate for an exempt study]: with food to evaluate quality, taste, or consumer acceptance.

The research must also comply with ONE of the following:

\_\_\_ a) The food has no additives;

or that

\_\_\_ b) The food is certified safe by the USDA, FDA or EPA.

**Part 3: Consent Form Information  
Can be Found on the Next Page.**

### CONSENT TO PARTICIPATE IN A WELLNESS PROGRAM

Adult Consent Form

Dear student,

Will you like to participate in a free, health, wellness and career-readiness program?

We would like to help you eat better, be more physically active and be better prepared to start a career. The program is divided into three parts: 1) food and nutrition, 2) physical activity, and 3) workforce development. The program will take place during 4<sup>th</sup> period in the fall, and 5<sup>th</sup> period in the spring three times per week. You will participate in either the fall or the spring, but not both.

You will help us evaluate the program by completing questionnaires at the beginning and end of each group of classes.

If you have any questions you can contact either one of the following investigators:

Georgianna Tuuri, PhD, LDN, RD  
Associate Professor of Nutrition  
School of Human Ecology  
Phone: 225-578-1722

Derek C. Miketinas, BS  
Graduate Student  
School of Human Ecology  
Phone: 225-578-8816

The Wellness Ambassador Program has been explained to me and all of my questions have been answered. I may direct additional questions regarding program specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dr. Phil H. Elzer, Associate Vice Chancellor & Associate Director, LSU AgCenter, (225) 578-4182. I will consent to participate in the Wellness Ambassador Program described on the back of this page and acknowledge the investigators' obligation to provide me with a signed copy of this consent form.

Your Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Information about you:

Name: \_\_\_\_\_ (please print)

Gender: \_\_\_\_\_ Grade: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_

Food Allergies or any other restrictions: \_\_\_\_\_

Please give us your address and telephone number in case we need to contact you:

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

\_\_\_\_\_

APPROVED BY  
LSU AG CENTER  
IRB# IRB AS #E13-9  
ON 9-1-2015

### Description of the Program

**Project Title:** "Wellness Ambassador Program"

**Investigators:** The following investigators are available for questions, M-F 8:00 am-4:30 p.m.

Georgianna Tuuri, PhD, LDN, RD  
Associate Professor of Nutrition  
School of Human Ecology  
225-578-1722

Derek Miketinas, BS  
Graduate Student  
School of Human Ecology  
225-578-8816

**Purpose of the Program:** To improve the personal health, wellness and career readiness of high school students who participate in the program.

**Inclusion Criteria:** Students in grades 9-12.

**Exclusion Criteria:** Students not in grades 9-12 and girls who are pregnant.

**Description of the Program:** Before participating, the student will complete a consent form. After the required forms are completed, the program will be explained by the program teachers. Students enrolled in the program will attend classes three times per week during 4<sup>th</sup> or 5<sup>th</sup> period for eight weeks to learn about: nutrition, physical health, or personal health and career readiness. When the program is finished, each student will help plan and participate in a community wellness fair where they will demonstrate the knowledge and skills that they have learned. After successfully completing all three program areas, each student will be awarded a Wellness Ambassador Certificate.

**Benefit:** You will learn information and skills to improve your overall health and will be better prepared to enter the workforce.

**Risks:** There are no known risks involved.

**Right to Refuse:** Participation is voluntary. A student will participate in the Wellness Ambassador Program only if you agree to participate. You may withdraw yourself from the program at any time.

**Privacy:** Results of the program may be published, but no names or identifying information will be included for publication. A student's identity will remain confidential unless disclosure is required by law.

**Financial Information:** There is no cost to participate in this program.

## CONSENT FOR CHILD TO PARTICIPATE IN A WELLNESS PROGRAM

### Parent Consent Form

Dear Parent or Caregiver,

Will you let your child participate in a free Health, Wellness, and Professional Development program? We would like to help your child eat better, be more physically active and be better prepared to start a career.

The program is divided into three parts: 1) food and nutrition, 2) physical activity, and 3) workforce development.

In addition to the Health Class, your child will have the opportunity to complete the Wellness Ambassador Program and receive a certificate. For each part of the program, he/she will attend class three times per week for eight weeks during either 4<sup>th</sup> period in the fall or 5<sup>th</sup> period in the spring. Your child will help us evaluate the program by completing questionnaires at the beginning and end of the program.

If you have any questions you can contact either one of the following investigators:

Georgianna Tuuri, PhD, LDN, RD  
Associate Professor of Nutrition  
School of Human Ecology  
Phone: 225-578-1722

Derek C. Miketinas, BS  
Graduate Student  
School of Human Ecology  
Phone: 225-578-8816

The Wellness Ambassador Program has been explained to me and all of my questions have been answered. I may direct additional questions regarding program specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dr. Phil H. Elzer, Associate Vice Chancellor & Associate Director, LSU AgCenter, (225) 578-4182. I will allow my child to participate in the Wellness Ambassador Program described on the back of this page and acknowledge the investigators' obligation to provide me with a signed copy of this consent form.

Your Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Information about your child:

Name: \_\_\_\_\_ (please print)

Gender: \_\_\_\_\_ Grade: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_

Food Allergies or any other restrictions: \_\_\_\_\_

Please give us your address and telephone number in case we need to contact you:

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

\_\_\_\_\_



APPROVED BY  
LSU AG CENTER  
IRB AS #HE13-9  
IRB# ON 9-1-2015

### Description of the Program

**Project Title:** "Wellness Ambassador Program"

**Investigators:** The following investigators are available for questions, M-F 8:00 am-4:30 p.m.

Georgianna Tuuri, PhD, LDN, RD  
Associate Professor of Nutrition  
School of Human Ecology  
225-578-1722

Derek Miketinas, BS  
Graduate Student  
School of Human Ecology  
225-578-8816

**Purpose of the Program:** To improve the personal health, wellness and career readiness of high school students who participate in the program.

**Inclusion Criteria:** Students in grades 9-12.

**Exclusion Criteria:** Students not in grades 9-12 and girls who are pregnant.

**Description of the Program:** Before participating, the parent/caregiver will complete a consent form for the participating child and the child will sign an assent form. After the required forms are completed, the program will be explained to the child by the program teachers. Students enrolled in the program will attend classes three times per week during 4<sup>th</sup> or 5<sup>th</sup> period for eight weeks to learn about: nutrition, physical health, or personal health and career readiness. When the program is finished, each child will help plan and participate in a community wellness fair where they will demonstrate the knowledge and skills that they have learned. After successfully completing all three program areas, each student will be awarded a Wellness Ambassador Certificate.

**Benefit:** Your child will learn information and skills to improve his or her overall health and will be better prepared to enter the workforce.

**Risks:** There are no known risks involved.

**Right to Refuse:** Participation is voluntary. A student will participate in the Wellness Ambassador Program only if both the child and the parent/caregiver agree to the child's participation. A child may be withdrawn at the request of the parent/caregiver or may withdraw himself from the program at any time.

**Privacy:** Results of the program may be published, but no names or identifying information will be included for publication. A child's identity will remain confidential unless disclosure is required by law.

**Financial Information:** There is no cost to participate in this program.

APPROVED  
LSU AG CENTER  
IRB AS #E13-9  
ON 9-1-2015

**ASSENT TO PARTICIPATE IN A WELLNESS PROGRAM**  
Youth Assent Form

Name of Principal Investigator: Georgianna Tuuri, PhD, RD, LDN (225-578-1722)

Name of Co-Investigator: Derek Miketinas, BS (225-578-8816)

**Name of the Program:** "Wellness Ambassador Program"

**Why are they doing this program?**

To improve the personal health and wellness of the students who participate in the program.

**What will happen to me?**

If I want to be in the program the following things will happen:

- I will attend three classes per week for eight weeks either during 4<sup>th</sup> or 5<sup>th</sup> period to learn about: Nutrition, Physical Health, or Personal Health and Workforce Development.
- I will demonstrate the skills and knowledge I have learned to my peers and community at a wellness fair.
- I will complete questionnaires before I begin and after I finish each program.
- When I successfully complete each of the three programs I will be awarded a Wellness Ambassador Certificate.

**What if I have questions?**

I can ask questions at any time.

**Do I have to be in the program?**

I don't have to be in the program if I don't want to and I can quit at any time.

-----  
I, \_\_\_\_\_, agree to participate in the Wellness Ambassador Program provided by the teachers from Louisiana State University.

\_\_\_\_\_  
Adolescent Signature

\_\_\_\_\_  
Age

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness\*

\_\_\_\_\_  
Date

\*Witness must be present for the assent process, not just for the signature by the minor.

APPROVED BY  
LSU AG CENTER  
IRB# IRB AS H213-9  
ON 5-9-2016

## CONSENT FOR CHILD TO PARTICIPATE IN A WELLNESS PROGRAM

Parent Consent Form

Dear Parent or Caregiver,

Will you let your child participate in a free Health, Wellness, and Professional Development program? We would like to help your child eat better, be more physically active, and be better prepared to start a career. The program is divided into three parts: 1) food and nutrition, 2) physical activity, and 3) workforce development.

With your permission, your child will have the opportunity to complete the Wellness Ambassador Program and receive a certificate. For each part of the program, he/she will attend class three times per week for eight weeks from June to July at either of the following locations:

**Dr. Martin Luther King, Jr. Community Center**  
4000 Gus Young Ave.  
Baton Rouge, LA 70802

**Gardere Initiative Headquarters**  
8435 Ned Ave. Apt A.  
Baton Rouge, LA 70802

Your child will help us evaluate the program by completing questionnaires at the beginning and end of the program.

If you have any questions you can contact either one of the following investigators:

Georgianna Tuuri, PhD, LDN, RD  
Associate Professor of Nutrition  
School of Nutrition and Food Sciences  
Phone: 225-578-1722

Derek C. Miketinas, BS  
Graduate Student  
School of Nutrition and Food Sciences  
Email: dmiket1@lsu.edu

The Wellness Ambassador Program has been explained to me and all of my questions have been answered. I may direct additional questions regarding program specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dr. Phil H. Elzer, Associate Vice Chancellor & Associate Director, LSU AgCenter, (225) 578-4182. I will allow my child to participate in the Wellness Ambassador Program described on the back of this page and acknowledge the investigators' obligation to provide me with a signed copy of this consent form.

Your Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Information about your child:

Name: \_\_\_\_\_ (please print)

Gender: \_\_\_\_\_ Grade: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_ Food Allergies or any restrictions: \_\_\_\_\_

Please give us your address and telephone number in case we need to contact you:

Address: \_\_\_\_\_  
\_\_\_\_\_ Phone Number: \_\_\_\_\_

### Description of the Program

**Project Title:** "Wellness Ambassador Program"

**Investigators:** The following investigators are available for questions, M-F 8:00 am-4:30 p.m.

Georgianna Tuuri, PhD, LDN, RD  
Associate Professor of Nutrition  
School of Human Ecology  
225-578-1722

Derek Miketinas, BS  
Graduate Student  
School of Human Ecology  
225-578-8816

**Purpose of the Program:** To improve the personal health, wellness and career readiness of high school students who participate in the program.

**Inclusion Criteria:** Students in grades 9-12.

**Exclusion Criteria:** Students not in grades 9-12 and girls who are pregnant.

**Description of the Program:** Before participating, the parent/caregiver will complete a consent form for the participating child and the child will sign an assent form. After the required forms are completed, the program will be explained to the child by the program teachers. Students enrolled in the program will attend classes three times per week during the summer for eight weeks to learn about: nutrition, physical health, or personal health and career readiness. After successfully completing all three program areas, each student will be awarded a Wellness Ambassador Certificate.

**Benefit:** Your child will learn information and skills to improve his or her overall health and will be better prepared to enter the workforce.

**Risks:** There are no known risks involved.

**Right to Refuse:** Participation is voluntary. A student will participate in the Wellness Ambassador Program only if both the child and the parent/caregiver agree to the child's participation. A child may be withdrawn at the request of the parent/caregiver or may withdraw himself from the program at any time.

**Privacy:** Results of the program may be published, but no names or identifying information will be included for publication. A child's identity will remain confidential unless disclosure is required by law.

**Financial Information:** There is no cost to participate in this program.

APPROVED BY  
LSU AG CENTER  
IRB# \_\_\_\_\_  
IRB AS HE13-9  
ON 5-9-2016

**CONSENT TO PARTICIPATE IN A WELLNESS PROGRAM**  
Adult Consent Form

Dear student,

Will you like to participate in a free, health, wellness and career-readiness program?

We would like to help you eat better, be more physically active and be better prepared to start a career. The program is divided into three parts: 1) food and nutrition, 2) physical activity, and 3) workforce development. The program will take place for eight weeks from June to July, and will be offered at the following locations:

**Dr. Martin Luther King, Jr. Community Center**  
4000 Gus Young Ave.  
Baton Rouge, LA 70802

**Gardere Initiative Headquarters**  
8435 Ned Ave. Apt A.  
Baton Rouge, LA 70802

You will help us evaluate the program by completing questionnaires at the beginning and end of each group of classes. If you have any questions you can contact either one of the following investigators:

Georgianna Tuuri, PhD, LDN, RD  
Associate Professor of Nutrition  
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Phone: 225-578-1722

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Graduate Student  
School of Nutrition and Food Sciences  
Email: dmiket1@lsu.edu

The Wellness Ambassador Program has been explained to me and all of my questions have been answered. I may direct additional questions regarding program specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dr. Phil H. Elzer, Associate Vice Chancellor & Associate Director, LSU AgCenter, (225) 578-4182. I will consent to participate in the Wellness Ambassador Program described on the back of this page and acknowledge the investigators' obligation to provide me with a signed copy of this consent form.

Your Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Information about you:

Name: \_\_\_\_\_ (please print)

Gender: \_\_\_\_\_ Grade: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_ Food Allergies or any restrictions: \_\_\_\_\_

Please give us your address and telephone number in case we need to contact you:

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

\_\_\_\_\_

### Description of the Program

**Project Title:** "Wellness Ambassador Program"

**Investigators:** The following investigators are available for questions, M-F 8:00 am-4:30 p.m.

Georgianna Tuuri, PhD, LDN, RD  
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**Benefit:** You will learn information and skills to improve your overall health and will be better prepared to enter the workforce.

**Risks:** There are no known risks involved.

**Right to Refuse:** Participation is voluntary. A student will participate in the Wellness Ambassador Program only if you agree to participate. You may withdraw yourself from the program at any time.

**Privacy:** Results of the program may be published, but no names or identifying information will be included for publication. A student's identity will remain confidential unless disclosure is required by law.

**Financial Information:** There is no cost to participate in this program.

APPROVED BY  
LSU AG CENTER  
IRB AS HE13-9  
ON 5-9-2016

## ASSENT TO PARTICIPATE IN A WELLNESS PROGRAM

Youth Assent Form

Name of Principal Investigator: Georgianna Tuuri, PhD, RD, LDN (225-578-1722)

Name of Co-Investigator: Derek Miketinas, BS (dmiket1@lsu.edu)

**Name of the Program:** "Wellness Ambassador Program"

**Why are they doing this program?**

To improve the personal health and wellness of the students who participate in the program.

**What will happen to me?**

If I want to be in the program the following things will happen:

- I will attend three classes per week for eight weeks during the summer to learn about: Nutrition, Physical Health, or Personal Health and Workforce Development.
- I will complete questionnaires before I begin and after I finish each program.
- When I successfully complete each of the three programs I will be awarded a Wellness Ambassador Certificate.

**What if I have questions?**

I can ask questions at any time.

**Do I have to be in the program?**

I don't have to be in the program if I don't want to and I can quit at any time.

-----  
I, \_\_\_\_\_, agree to participate in the Wellness Ambassador Program provided by the teachers from Louisiana State University.

\_\_\_\_\_  
Adolescent Signature

\_\_\_\_\_  
Age

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness\*

\_\_\_\_\_  
Date

\*Witness must be present for the assent process, not just for the signature by the minor.

## APPENDIX III ADOLESCENT MOTIVATION TO COOK QUESTIONNAIRE

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

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

Pre Post

### Motivation to Prepare Healthy Food Safely

Fruits, vegetables, low-fat milk and milk products, and whole grains are considered healthy foods while foods high in sodium (salt), solid fats, and added sugars are considered less healthy.

**Instructions:** The following sentences refer to your overall experiences preparing healthy food. Using the 5-point scale below, please indicate the extent to which you agree with statements by completely filling in your response.

	<i>Disagree a lot</i>	<i>Disagree</i>	<i>Neither Agree/ Disagree</i>	<i>Agree</i>	<i>Agree a lot</i>
1. I enjoy preparing healthy food very much.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I think it is fun preparing healthy food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Preparing healthy food holds my attention well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I would describe preparing healthy food as very interesting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Preparing healthy food is quite enjoyable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I think I am pretty good at preparing healthy food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I do pretty well preparing healthy food compared to other people my age.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I feel pretty confident about my food preparation skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I am satisfied with my ability to prepare healthy foods.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I am pretty skilled at preparing healthy food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Instructions:** Please indicate how much you agree or disagree with the following statements about your instructor in this class:

	<i>Disagree a lot</i>	<i>Disagree</i>	<i>Neither Agree/ Disagree</i>	<i>Agree</i>	<i>Agree a lot</i>
11. My instructor provides me with choices and options.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I feel my instructor understands me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. My instructor expresses confidence in my ability to do well in the course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. My instructor encourages me to ask questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. My instructor listens to how I would like to do things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. My instructor considers how I see things before suggesting a new way to do things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**Instructions:** Please indicate how much you agree or disagree with the following statements about your fellow classmates in this class:

	<i>Disagree a lot</i>	<i>Disagree</i>	<i>Neither Agree/Disagree</i>	<i>Agree</i>	<i>Agree a lot</i>
17. I can really trust my classmates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I'd like a chance to interact with my classmates more often.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. It is likely that my classmates and I could become friends if we interacted a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I feel close to my classmates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I really enjoy interacting with my classmates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Instructions:** Please indicate how much you agree with the following statements about your actions in this class:

	<i>Disagree a lot</i>	<i>Disagree</i>	<i>Neither Agree/Disagree</i>	<i>Agree</i>	<i>Agree a lot</i>
22. If I had the choice, I would choose to take this class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. I feel comfortable participating in class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I feel free to make my own decisions in class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. I feel free to express myself, my opinions, and my concerns in class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<b>Grade Level</b>	9th	10th	11th	12th
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Race</b>	African American or Black	Caucasian or White	Hispanic or Latino	Other
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Gender</b>	Male		Female	
	<input type="radio"/>		<input type="radio"/>	

**Please check one of the following statements:**

- I am currently taking a cooking class.
- I have taken a cooking class before.
- I have never taken a cooking class.

# APPENDIX IV

## 9<sup>TH</sup> – 12<sup>TH</sup> GRADE NUTRITION EDUCATION SURVEY

### 9<sup>th</sup>-12<sup>th</sup> GRADE NUTRITION EDUCATION SURVEY

School/Site: \_\_\_\_\_ Grade: \_\_\_\_\_ Educator: \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_  Post

Student's Code Number: \_\_\_\_\_ (Office use only)

**For each question, circle the answer that best describes you.  
The first 4 questions ask about food you ate or drank.**

	0	1	2	3	4
<b>1. Yesterday, how many times did you eat vegetables, not counting French fries?</b> Include cooked vegetables, canned vegetables and salads. If you ate 2 different vegetables in a meal or snack, count them as 2 times.	None	1 time	2 times	3 times	4+ times
<b>2. Yesterday, how many times did you eat fruit, not counting juice?</b> Include fresh, frozen, canned, and dried fruits. If you ate 2 different fruits in a meal or snack, count them as 2 times.	None	1 time	2 times	3 times	4+ times
<b>3. Yesterday, how many times did you drink non-fat or 1% low fat milk?</b> Include low fat chocolate or flavored milk, and low fat milk on cereal.	None	1 time	2 times	3 times	4+ times
<b>4. Yesterday, how many times did you drink sweetened drinks like soda, fruit-flavored drinks, sports drinks, energy drinks and vitamin water?</b> Do not include 100% fruit juice.	None	1 time	2 times	3+ times	

**The next 2 questions ask about how often you choose certain foods.**

	1	2	3	4	5
<b>5. When you eat grain products, how often do you eat whole grains, like brown rice instead of white rice, whole grain bread instead of white bread, and whole grain cereals?</b>	Never	Once in a while	Sometimes	Most of the time	Always
<b>6. When you eat out at a restaurant or fast food place, how often do you make healthy choices when deciding what to eat?</b>	Never	Once in a while	Sometimes	Most of the time	Always

The next 3 questions are about physical activity.

	0	1	2	3	4	5	6	7
7. During the past 7 days, how many days were you physically active for at least 1 hour?	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days

	1	2	3	4	5
8. During the past 7 days, how often were you so active that your heart beat fast and you breathed hard most of the time?	Never	1 time last week	2 times last week	3 times last week	4 or more times last week
9. How many hours a day do you spend watching TV or movies, playing electronic games, or using a computer for something that is not school work?	1 hour or less	2 hours	3 hours	4 hours	5 or more hours

The next 5 questions are about how you handle food.

	1	2	3	4	5
10. How often do you wash your hands before preparing something to eat? Think about preparing snacks or meals.	Never	Once in a while	Sometimes	Most of the time	Always
11. How often do you wash vegetables and fruits before eating them?	Never	Once in a while	Sometimes	Most of the time	Always
12. When you take foods out of the refrigerator, how often do you put them back within 2 hours?	Never	Once in a while	Sometimes	Most of the time	Always
13. How often do you check the expiration date before eating or drinking foods?	Never	Once in a while	Sometimes	Most of the time	Always

	0	1	2	3	4	5
14. In the last month, if your family did not have enough food, how often did you help by going to a food pantry or finding other free or low-cost food resources?	Does not apply	Never	1 time	2 times	3 times	4 or more times

# APPENDIX V

## NUTRITION BEHAVIORAL AND KNOWLEDGE QUESTIONS

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

Pre/Post

### Nutrition Behavioral and Knowledge Questions

1. Before handling food, you should wash your hands with soap and warm water for \_\_\_\_\_?
    - A) 10 seconds
    - B) 15 seconds
    - C) 20 seconds
    - D) 30 seconds
  2. You can better control what you eat by
    - A) Cooking your own food.
    - B) Reading food labels.
    - C) Eating out more often.
    - D) Answers A and B are correct.
  3. You should consume dairy products because
    - A) They are good for your bones
    - B) They are rich in iron
    - C) The calcium in dairy products helps lower your blood pressure
    - D) Answers A and C are correct.
  4. What are the benefits of eating foods high in fiber such as beans, whole grains, fruits, and vegetables?
    - A) They keep your gut healthy.
    - B) They help you feel fuller.
    - C) Some of these high fiber foods lower cholesterol.
    - D) Answers A, B, and C are correct
  5. Potassium helps lower blood pressure and prevents bone loss. Which of the following foods are rich in potassium?
    - A) Fruits such as bananas and oranges
    - B) Vegetables such as potatoes and greens
    - C) Grains such as bread, bagels, and rolls
    - D) Answers A and B are correct
  6. Yesterday, how many times did you prepare food at home (either for yourself or your family)?
    - A) None
    - B) 1 time
    - C) 2 times
    - D) 3 or more times
  7. Yesterday, how many times did you eat vegetables, not counting French fries? Include fresh, cooked, canned and frozen vegetables, and salads.
    - A) None
    - B) 1 time
    - C) 2 times
    - D) 3 or more times
-

8. Yesterday, how many times did you eat fruit, not counting juice? Include fresh, frozen, canned and dried fruits.

- A) None
- B) 1 time
- C) 2 times
- D) 3 or more times

9. Yesterday, how many times did you consume nonfat or low-fat milk, yogurt or cheese?

- A) None
- B) 1 time
- C) 2 times
- D) 3 or more times

10. When you eat grain products, how often do you eat whole grains like brown rice instead of white rice, whole grain bread instead of white bread, and whole grain cereals?

- A) Never
- B) Once in a while
- C) Most of the time
- D) Always

11. How often do you wash your hands before preparing foods?

- A) Never
- B) Once in a while
- C) Most of the time
- D) Always

<b>Please indicate your level of agreement with each statement below.</b>	<b>STRONGLY AGREE</b>	<b>AGREE</b>	<b>DISAGREE</b>	<b>STRONGLY DISAGREE</b>
I am confident that I can perform basic cooking techniques such as chopping, measuring and using the stove.				
It will not be a problem for me to prepare fresh or frozen green vegetables.				
I am optimistic that I will be able to eat fruits and vegetables at every meal every day.				

## **APPENDIX VI PROGRAM CURRICULUM**

### Lesson 1. Overview of Nutritional Health

- Objectives
  - At the end of the session, participants will be able to:
    - State the amounts recommended by MyPlate for each of the 5 food groups.
    - Identify food in each of the 5 food groups.
    - Demonstrate how to cut fresh fruit with proper cutlery equipment and skills
    - Demonstrate how to measure dry and wet ingredients.
    - Demonstrate proper hand washing and food washing techniques
- Homework:
  - Locate serving size and nutrition information (calories, total fat, saturated fat, sodium, sugar & fiber) on the food label and use the label to choose healthier alternatives.
  - Cook this week's vegetable at home and take a picture

### Materials and Supplies

- Projector and screen/white wall
- Markers
- Cooking utensils, supplies, aprons
- Handouts:
  - MyPlate and Food label handout
- Ingredients for recipe
- Cleaning supplies

### Lesson

- Introduction
  - Introduce the instructors, have the students introduce themselves, explain briefly what they will be doing in the program
- The Dietary Guidelines MyPlate
  - Ask who is familiar with MyPlate and the Dietary Guidelines for Americans 2010
  - Explain the nutrition education portion of the curriculum will focus on these guidelines
- Overview of lesson one
  - Learn what the food groups are and the recommended amounts
  - Identify foods in each of the 5 food groups

- Learn how to use the Nutrition Facts Label
- Demonstrate proper hand washing and food washing techniques
- Prepare a healthy snack using proper food preparation and safety techniques
- What is a diet?
  - Explain that a diet is not something a person “goes on” rather, it is their dietary pattern/intake.
- What is a healthy diet?
  - Look for answers
  - Explain that a healthy diet is rich in fruits, vegetables, whole grains, low-fat/non-fat dairy, and lean protein and is low in added sugars, saturated and trans-fats, and sodium.
- What are the food groups? What are examples of foods from each group?
  - Many of the students should be able to describe the food groups.
  - The instructor should also provide examples of foods from each group that the students may have missed, especially unconventional foods.
- How much of each food group do you need?
  - Not an open ended question- can be explained and illustrated using the power point presentation.
- How do you know what is in the packaged food you buy?
  - Look for answers- The nutrition facts label.
  - Many students will know what this is but it is important to explain each part of the label and how to use it.
  - Explain the ingredients list: order of ingredients listed, and explain what certain ingredients are (e.g. enriched vs whole grain flours).
- Food Safety
  - Proper hand washing, food washing, and cross contamination procedures must be established and explained to the students.
  - Hand washing- wash hands with soap and warm water for 20 seconds
  - Food washing- wash all produce thoroughly under cold water and dry with paper towels
  - Cross contamination- avoid using utensils that touched raw animal products on produce and other foods
- Closing
  - Conclude with the key points of the presentation (healthy diet, nutrition facts label, and food safety) and segue into the cooking portion of the class by introducing the recipe.

Prepare the Fruit Salad recipe located on the handout.

- This recipe requires proper measurement techniques, cutlery skills, food safety considerations, and time management.

- Split the students into groups- it will help to have permanent groups so that students become familiar with each other.
- Explain the recipe: key points to consider when cooking/preparing and food safety considerations.
- While the students are working, check on each group and provide assistance or guidance when needed.
- Have the students try their food and prepare samples for the other classmates.
- Clean each unit and all of the cooking equipment and utensils.

## Resources

- MyPlate and Food Label handout (lesson 1)
- Lesson 1 PowerPoint presentation
- The Dietary Guidelines for Americans 2010 Chapter 1

## Lesson 2. Energy Balance

- Objectives
  - At the end of the session, participants will be able to:
    - Define energy density and distinguish between high & low energy-dense foods
    - Determine calorie needs based on height, weight, age, gender, and activity level
    - Apply method of heat application: Sauté
    - Demonstrate how to slice, dice, and chop
    - Demonstrate proper food safety technique: avoid cross-contamination
  - Homework:
    - Use SuperTracker to record food intake for one day and identify energy-dense foods listed in the record.
    - Cook this week's vegetable at home and take a picture
- Materials and Supplies
  - Projector and screen/white wall
  - Cooking utensils, supplies, aprons
  - Handouts:
    - Lesson 2 Handout
  - Ingredients for Vegetable Fried Rice
  - Cleaning supplies

## Lesson

- What is a calorie?



- Look for answers, explain a calorie is a unit of energy used to describe the energy content of foods and beverages.
- What nutrients have calories?
  - Carbohydrates - 4 calories per gram
  - Protein - 4 calories per gram
  - Fat - 9 calories per gram
  - Fat is the most calorie-dense of these nutrients. Reference the nutrition facts label to illustrate where the amounts of each calorie-containing nutrient can be found.
- Energy balance-
  - Energy in- the sum of all the calorie containing foods and beverages consumed per day.
  - Energy out- the amount of calories burned each day. Includes exercising, walking, moving, working, and other activities.
  - Explain that when “energy in” is greater than “energy out,” the result is weight gain
  - Explain that when “energy in” is less than “energy out,” the result is weight loss
  - Explain that when “energy in” is equal to “energy out,” the result is weight maintenance
- Calculating energy needs
  - Explain how to find calorie needs using the chart provided on the handout
    - Identify the appropriate gender/activity level column
    - Locate the calorie needs from the corresponding age level
- Energy density
  - Explain what energy density is
    - Energy Density is the ratio of calories in a food (or beverage) to the gram weight of the food (or beverage)
  - Usually, foods that are energy dense are high in added fats and sugars
  - Energy density can give a good idea of portion size and control but there are some limitations
  - What are some examples of Energy Dense foods?
    - Some examples- fried potato chips, French fries, bacon, butter, shortening, cakes, pastries
- Energy density examples
  - Give energy density examples of three foods: a medium apple, a medium serving of French fries, and one 12oz can of regular soda
  - Explain that energy density can be useful for understanding that certain foods are more “packed” with calories
  - Explain that although some foods may have low energy density, there can be healthier alternatives (example: apple versus regular soda)
- Nutrient density

- Explain what nutrient density is
  - There is no standard definition or calculation
  - Generally speaking, nutrient density is the ratio of nutrients within a food (or beverage) to the gram weight of that food (or beverage)
  - Look for foods rich in vitamins and minerals: fruits, vegetables, whole grain products, low-fat/non-fat dairy products, whole foods, and cereals
- SuperTracker
  - Instruct the participants that for homework, they will need to record their foods and beverages for one day
  - Follow the instructions on the PowerPoint and handout
- Closing
  - Energy balance requires proper diet and exercise
  - Energy Density is a measure of calories per gram weight
  - Nutrient Density is a measure of a food's nutrients per gram weight
  - Choose fruits, vegetables, whole grains, low-fat/non-fat dairy products, and lean protein

Prepare the Vegetable Fried Rice recipe located on the handout

- This recipe requires proper measurement techniques, heat application, cutlery skills, food safety considerations, and time management. It helps to prepare the rice the day prior to the lesson. Can add an additional protein (e.g. grilled chicken)
  - Split the students into groups- it will help to have permanent groups so that students become familiar with each other.
  - Explain the recipe: key points to consider when cooking and the food safety considerations.
  - While the students are working, check on each group and provide assistance or guidance when needed.
  - Have the students try their food.
  - Clean each unit, the cooking equipment, and utensils.
  - Turn off stoves and equipment.
  - Remove any food particles in sinks.
- Resources
  - Lesson 2 Handout
  - Lesson 2 PowerPoint presentation
  - The Dietary Guidelines for Americans 2010 Chapter 2

### Lesson 3. Foods and Nutrients to Reduce

- Objectives
  - At the end of the session, participants will be able to:

- Recall the Dietary Guidelines message to reduce consumption of sodium, solid fat, saturated and trans-fats, and added sugars.
  - Identify foods high in sodium, solid fat, saturated and trans-fats, and added sugars.
  - Describe possible negative health outcomes of overconsumption of these foods.
  - State healthy alternatives to popular foods high in sodium, solid fats and trans-fats, and added sugars.
  - Apply method of heat application: Pan fry
  - Identify and demonstrate healthy methods of flavor enhancement.
  - Demonstrate proper food safety technique: avoid cross-contamination
- Homework:
  - Modify a 24-hour dietary record replacing foods to reduce with healthier alternatives.
  - Cook this week's vegetable at home and take a picture
- Materials and Supplies
  - Projector and screen/white wall
  - Cooking utensils, supplies, aprons
  - Handouts:
    - Lesson 3 Handout
  - Ingredients for Recipe: Honey Garlic Chicken
  - Cleaning supplies

## Lesson

- Recap: Energy Density
  - Explain that choosing less energy-dense foods can be beneficial
  - For the same number of calories, a person can consume more foods (by weight) with lower energy density than foods with higher energy density. These foods with lower energy density also tend to also have more nutrients.
  - Choose fruits, vegetables, whole grains, low-fat/non-fat dairy products, and lean protein
- What are some foods and nutrients to reduce?
  - Foods high in:
    - Sodium
    - Solid fats
    - Saturated and trans-fats
    - Cholesterol
    - Added sugars
    - Alcohol

- For this age group, explain there is no acceptable level of consumption for alcohol. Children and adolescents should abstain from all alcohol consumption.
      - Over-consumption of these nutrients could increase a person's risk for heart disease, diabetes, obesity, hypertension, and other chronic illnesses.
    - In what foods are these nutrients abundant?
      - Sodium
        - French fries, potato chips, pizza, sauces, cured meats, condiments
      - Solid Fats (Saturated and Trans-fats)
        - Butter, margarine, Crisco, meats (small amounts), high-fat milk products
      - Cholesterol
        - Eggs, chicken, beef, other animal products
      - Added Sugars
        - Soft drinks, candy, juices, pastries, desserts, sweetened yogurt, flavored milk
      - Alcohol
    - Why should people decrease their consumption of these foods?
      - Sodium
        - An essential nutrient BUT too much is associated with high blood pressure
        - High blood pressure could lead to heart problems and kidney disease
      - Solid fats
        - Solid fats vs Oils
          - Fats= solid at room temperature
          - Oils= liquid at room temperature
        - Solid fats are associated with a high risk for developing cardiovascular disease
      - Trans-fats are NON-ESSENTIAL! They increase the risk for developing cardiovascular disease
      - Cholesterol
        - Increased risk for cardiovascular disease
      - Added sugars
        - Supply calories, but not nutrients
      - Alcohol
        - No nutritional value
        - Over-consumption can lead to malnourishment, liver damage, increase risk for breast cancer
    - How to locate these foods on a food label
      - Read the ingredients list

- Saturated fat, cholesterol, and sodium are clearly identified by the nutrition facts label; however, added trans-fatty acids and added sugars are not easily identifiable
    - While the nutrition facts label does identify trans-fats, a value of 0g per serving could indicate that the food contains less than 0.5g per serving
      - Check the ingredients list for the word “hydrogenated”
    - Sugars are listed on the nutrition facts label; however, it does not distinguish between sugars that are naturally present in the food and added sugars
      - Look for ingredients: corn syrup, high fructose corn syrup, maltodextrin, molasses, honey, syrup, cane sugar
- Which foods are low in these nutrients?
  - Fruits, vegetables, and whole grains
    - These food groups do not have trans-fats nor cholesterol
    - These food groups are low in sodium
    - Some of these food groups may have added sugars
      - Fruit juices (not 100% fruit juice)
      - Canned fruit in syrup
      - Vegetable juices (not 100% vegetable juice)
      - Whole grain breads
  - Low-fat/non-fat dairy products
  - Lean protein

Prepare the Honey Garlic Chicken recipe located on the handout

- This recipe requires proper measurement techniques, heat application, cutlery skills, food safety considerations, and time management.
  - Split the students into groups- it will help to have permanent groups so that students become familiar with each other.
  - Explain the recipe: key points to consider when cooking and the food safety considerations.
  - While the students are working, check on each group and provide assistance or guidance when needed.
  - Have the students try their food.
  - Clean each unit, the cooking equipment, and utensils.
  - Turn off stoves and equipment.
  - Remove any food particles in sinks.
- Resources
  - Lesson 3 Handout
  - Lesson 3 PowerPoint presentation

- The Dietary Guidelines for Americans 2010 Chapter 3

#### Lesson 4. Foods and Nutrients to Increase

- Objectives
  - At the end of the session, participants will be able to:
    - Recall the Dietary Guidelines message to increase consumption of vegetables, fruits, whole grains, milk and milk products.
    - Identify foods rich in whole grains and high in fiber compared to refined grain and low-fiber foods.
    - Identify low-fat dairy foods and describe their role in a healthy diet.
    - Describe the protective roles of fruits and vegetables on overall health.
    - Recognize and state the names of fresh produce.
    - Explain the characteristics of fresh produce desirable for purchase.
    - Demonstrate how to estimate weights of foods by using proper measurement techniques.
    - Explain proper food storage techniques.
    - Demonstrate proper food and cutlery safety techniques.
  - Homework:
    - Prepare a vegetable 2 ways. Vegetable will be provided.
- Materials and Supplies
  - Projector and screen/white wall
  - Cooking utensils, supplies, aprons
  - Handouts:
    - Lesson 4 Handout
  - Ingredients for Recipe: Tuna/Salmon Sandwich Melt
  - Cleaning supplies

#### Lesson

- Recap:
  - Foods and nutrients to reduce
    - Sodium
    - Solid fats
    - Saturated and trans-fats
    - Cholesterol
    - Added sugars
    - Alcohol
  - Why reduce consumption of these foods?
    - Over-consumption of these nutrients could increase a person's risk for heart disease, diabetes, obesity, hypertension, and other chronic illnesses.
- What are the food groups to increase?
  - Fruits

- Vegetables
- Whole grains
- Low-fat dairy products
- Seafood
- Fruits and vegetables
  - Eat a variety of vegetables, especially dark-green, red, and orange vegetables, and beans and peas.
  - Major sources of nutrients
    - Vitamins A, C and K, and folate, magnesium, potassium, and fiber
  - Consumption of fruits and vegetables could lower a person's risk for chronic diseases such as:
    - Heart attacks, stroke, and certain types of cancer
  - Beans are an excellent source of protein, vitamins, minerals, and fiber
  - What about juice?
    - Read the labels; look for 100% fruit juice
    - Many fruit punch drinks contain juice, but this does not count towards the recommendations for fruit
    - Only 100% fruit juice can count as a serving of fruit
    - 100% vitamin C does not mean 100% fruit
- Whole grains
  - Consume at least half of all grains as whole grains. Increase whole-grain intake by replacing refined grains with whole grains.
  - Benefits:
    - Reduced risk of heart disease, lower body weight, could help reduce risk of type 2 diabetes
  - What is a whole grain?
    - Whole grains include the entire grain seed, usually called the kernel. The kernel consists of three components—the bran, germ, and endosperm.
  - Refined grains
    - Refined grains have been milled to remove the bran and germ from the grain. Must be enriched- nutrients are added back
- Whole grains vs refined grains sources
  - Whole grain sources:
    - Oats, whole grain breads and pasta, quinoa, barley, whole grain cereals, and whole grain granola bars
  - Refined grain sources:
    - White breads, pastries, cakes, muffins, toaster pastries, pizza dough, cookies, and pretzels
- How to identify breads with whole grains
  - White – no whole grains

- Wheat – some whole grains
- 100% whole wheat – all whole grains
- Check the ingredients label
  - Enriched wheat flour- refined grain
  - Whole grain flour- whole grain
- Increase intake of fat-free or low-fat milk and milk products, such as milk, yogurt, cheese, or fortified soy beverages
  - Benefits
    - Improved bone health- Calcium and Vitamin D
    - Reduced risk for cardiovascular disease, type 2 diabetes, and lower blood pressure in adults
  - Pay attention to fat content!
    - Cheeses
    - Low-fat yogurt
    - Skim milk
    - Butter??
- Increase the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry.
  - Seafood contains omega-3 fatty acids which help prevent heart disease
    - Tuna, salmon, trout, tilapia, shellfish
  - Remember to eat these foods with little added fats and oils
    - Instead of deep frying foods, pan fry foods
- Closing
  - Eat a variety of fruits, vegetables, whole grains, low-fat dairy, and lean protein

Prepare the Tuna/Salmon Sandwich Melt recipe located on the handout

- This recipe requires proper measurement techniques, cutlery skills, food safety considerations, and time management.
  - Split the students into groups- it will help to have permanent groups so that students become familiar with each other.
  - Explain the recipe: key points to consider when cooking and the food safety considerations.
  - While the students are working, check on each group and provide assistance or guidance when needed.
  - Have the students try their food.
  - Clean each unit, the cooking equipment, and utensils.
  - Turn off stoves and equipment.
  - Remove any food particles in sinks.
- Resources



- Lesson 4 Handout
- Lesson 4 PowerPoint presentation
- The Dietary Guidelines for Americans 2010 Chapter 4

## Lesson 5. Building Healthy Eating Patterns

- Objectives
  - At the end of the session, participants will be able to:
    - Identify barriers to making healthy food choices.
    - Distinguish between valid and false health claims made by food and supplement producers.
    - Apply method of heat application: sweat, sauté, and boil
    - Prepare a recipe that uses 3 of the 5 food groups of the Dietary Guidelines while demonstrating proper food preparation and safety techniques.
  - Homework:
    - Using the USDA Food Patterns (DGA Appendix 7) for a given calorie requirement level, build a daily meal plan that includes all of the food groups in recommended amounts.
    - Cook this week's vegetable at home and take a picture
- Materials and Supplies
  - Projector and screen/white wall
  - Cooking utensils, supplies, aprons
  - Handouts:
    - Lesson 5 Handout
  - Ingredients for Recipe: Black Bean Burritos
  - Cleaning supplies

## Lesson

- Overview
  - List barriers to making healthy food choices.
  - Distinguish between valid and misleading health claims made by producers.
  - Build a daily meal plan that includes all of the food groups in recommended amounts.
- Identify barriers to healthy eating
  - What is healthy eating?
    - Emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products;
    - Includes lean meats, poultry, fish, beans, eggs, and nuts; and
    - Is low in saturated fats, trans-fats, cholesterol, salt (sodium), and added sugars
  - What are some potential barriers to following a healthy diet?

- How can you overcome these barriers?
- Distinguish between valid and misleading health claims
  - Be on the look-out for claims made by food producers
  - Not everything that is packaged nicely or has positive health claims is good for you
  - Pay attention to the food label!
  - Context is everything
    - Peanut butter example
    - Toaster pastries example
    - Weight loss drink example
    - Calcium supplement example
- Create a meal plan
  - Identify energy needs
  - Determine average daily intake amounts
  - Fill in the blanks
- Choose recipes for lesson 6 in addition to the herb salad with vinaigrette
  - The lesson 6 allows for students to prepare recipes (in addition to the herb salad) of their choice.
  - The recipes must include food groups emphasized in Lesson 4

Prepare the Black Bean Burritos recipe located on the handout

- This recipe requires proper measurement techniques, heat application, cutlery skills, food safety considerations, and time management.
  - Split the students into groups- it will help to have permanent groups so that students become familiar with each other.
  - Explain the recipe: key points to consider when cooking and the food safety considerations.
  - While the students are working, check on each group and provide assistance or guidance when needed.
  - Have the students try their food.
  - Clean each unit, the cooking equipment, and utensils.
  - Turn off stoves and equipment.
  - Remove any food particles in sinks.
- Resources
  - Lesson 5 Handout
  - Lesson 5 PowerPoint presentation
  - The Dietary Guidelines for Americans 2010 Chapter 5

Lesson 6. Helping Americans Make Healthy Choices

- Objectives

- At the end of the session, participants will be able to:
- Explain how individual factors, environmental settings, sectors of influence, and social and cultural norms and values influence nutrition decisions.
- Recall personal examples of influences within each domain.
- Prepare a recipe that incorporates all 5 food groups of the Dietary Guidelines while demonstrating proper food preparation and safety techniques.
- Homework:
  - Generate a personal plan of action to improve each socio-ecological framework's level of influence on food choices, and describe how the nutritional health curriculum has positively impacted eating behaviors and food consumption.
  - Cook this week's vegetable at home and take a picture
- Materials and Supplies
  - Projector and screen/white wall
  - Cooking utensils, supplies, aprons
  - Handouts:
    - Lesson 6 Handout
  - Ingredients for Recipes
  - Cleaning supplies

## Lesson

- Overview
  - Explain how individual factors, environmental settings, sectors of influence and social and cultural norms and values influence nutrition decisions.
  - Recall personal examples of influences within each domain.
- Factors that influence decision making
  - Individual factors
    - Personal factors that influence decisions
      - Age, race, gender, income, genetics, disabilities
  - Environmental setting
    - Social settings that influence decisions
      - School, workplace, faith-based organizations, recreational centers, food/retail establishments
  - Sectors of influence
    - Institutions that influence decision making
      - Government, public health care systems, agriculture, industry, media
  - Social and cultural norms and values
    - Shared assumptions of appropriate behavior based on values of society
      - Types of foods/beverages consumed, when/how foods are consumed, acceptable body weight, physical activity allowance

- Conclusion
  - Ultimately, you can control what you eat
  - Understand that there are some internal and external factors that may influence your decisions
  - Continue to work to make healthy choices
  - Encourage others to do the same

Prepare the Herb salad with vinaigrette located on the handout

- This recipe requires proper measurement techniques, cutlery skills, food safety considerations, and time management. The salad itself doesn't take much time to prepare. The extra time is for preparing additional recipes suggested by the students.
  - Split the students into groups- it will help to have permanent groups so that students become familiar with each other.
  - Explain the recipe: key points to consider when cooking and the food safety considerations.
  - While the students are working, check on each group and provide assistance or guidance when needed.
  - Have the students try their food.
  - Clean each unit, the cooking equipment, and utensils.
  - Turn off stoves and equipment.
  - Remove any food particles in sinks.
- Resources
  - Lesson 6 Handout
  - Lesson 6 PowerPoint presentation
  - The Dietary Guidelines for Americans 2010 Chapter 6

## **VITA**

Derek Miketinas was born in South Mississippi in 1991 and graduated high school from St. Stanislaus College in 2009. He graduated from Louisiana State University in May, 2013 where he received his Bachelor of Science degree in Nutrition and Food Sciences with a concentration in Dietetics. He began the Doctor of Philosophy program in the School of Nutrition and Food Sciences in August, 2013. He is a member of the American Society for Nutrition and the Academy of Nutrition and Dietetics.