AN ANALYSIS OF THE IMPACT OF SOCIAL SUPPORT AND SELECTED DEMOGRAPHICS ON PHYSICAL ACTIVITY, DIETARY BEHAVIOR AND ACADEMIC ACHIEVEMENT AMONG MIDDLE AND HIGH SCHOOL STUDENTS

A dissertation submitted to the Kent State University College and Graduate School of Education, Health, and Human Services in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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AN ANALYSIS OF THE IMPACT OF SOCIAL SUPPORT AND SELECTED DEMOGRAPHICS ON PHYSICAL ACTIVITY, DIETARY BEHAVIOR AND ACADEMIC ACHIEVEMENT AMONG MIDDLE AND HIGH SCHOOL STUDENTS

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Literature based on ecological models confirms that overweight and obesity are a result of individual characteristics as well as, the environmental context in which an individual exists (Bronfenbrenner, 1979). This context includes the environment at home, at school, and in the community. Conflicting evidence exists regarding the role of social support for physical activity and dietary behavior on children and adolescents (Prochaska, Rodgers, & Sallis, 2002). In this study the role of social support as it relates to physical activity, dietary behavior, and academic achievement was explored.

An online survey was administered to middle and high school students enrolled in a Northeast Ohio school. The instrument explored subjects’ perceptions regarding their own physical activity and dietary behaviors, and perceived support from family, friends, and schools for physical activity participation and dietary behaviors. Further, the relationship between these variables and academic achievement was analyzed. Multiple regression and logistic regression analyses were conducted to establish relationships between variables.

A relationship was revealed between school social support for physical activity and physical activity behavior. Once age and gender were introduced into the model, no
statistical significance was revealed. No statistical significance was found among other study variables.

Although the current study did not find a significant relationship between the variables studied, there is consensus in the literature regarding the link between overall health, physical activity, and nutrition on academic achievement. The role of social support is still a growing literature and one that still needs to be explored.
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ever they may take you and to never forget those who went along for the ride! I love you both more than words could say.
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CHAPTER I

INTRODUCTION

With the 1979 publication of Healthy People: The Surgeon General’s Report on Health Promotion and Disease Prevention, the Healthy People initiative was established. The purpose of this agenda was to identify and create goals to address the health needs of the nation. The current iteration, Healthy People 2020: Improving the Health of Americans identifies four overarching goals organized into 42 health related focus areas. Within these the focus areas nearly 600 measurable objectives are specified (Koh, Kumanyika, & Fielding, 2011). The four overarching goals include:

- to attain high-quality longer lives free of preventable disease, disability, injury and premature death;
- to achieve health equity, eliminate disparities and improve the health of all groups;
- to create social and physical environments that promote good health for all;
- to promote quality of life, healthy development and health behaviors across all life stages. (U.S. Department of Health and Human Services [USDHHS], 2013)

These goals (USDHHS, 2013) reflect a commitment to a social determinant approach to health promotion. In such an orientation to health promotion, the individual is seen as part of a community. Further, the environment in which that individual exists is determined to have an impact on their overall health. For this reason, the social determinant, also described as an ecological approach, to health education and promotion
is a sound way to reach the goals and objectives delineated in the Health People initiatives (USDHHS, 2013).

With the publication of “Actual Causes of Deaths in the United States” by Mokdad, Marks, Stroup, and Gerberding in 2004, research documented that half of all deaths in the United States were attributable to preventable causes. Further, these causes were linked to chronic conditions (Mokdad et al., 2004). In this context, there has been a shift in focus away from singular attention to the treatment of infectious disease to the prevention and management of chronic diseases among health professionals in the United States. This shift has occurred over recent decades (Anderson & Horvath, 2004). Unfortunately, attention to important and influential but complex chronic disease management and prevention can be overshadowed by more urgent problems. These pressing problems include the treatment of infectious diseases that have a single and identifiable cause. As a result, the urgent takes precedence over the important (McGinnis & Foege, 2004). According to McGinnis and Foege, “One of the most difficult challenges is to ensure that the urgent does not crowd out the important. In health, this challenge is especially difficult because urgent matters can be so riveting” (p. 1263).

The challenge associated with focusing on prevention versus cure has been an issue in the U.S. for many decades. In part, this is related to the fact that often chronic diseases have multiple potential causes and risk factors. The complexity of chronic diseases makes it difficult to pinpoint a single culprit (Mokdad et al., 2004).

Chronic diseases are defined as those conditions that last a year or more and require ongoing medical attention. Furthermore, chronic diseases limit activities of daily
living (Hwang, Weller, Ireys, & Anderson, 2001). According to Anderson and Horvath (2004),

Quality medical care for people with chronic conditions requires a new orientation toward prevention of chronic disease and provision of ongoing care and care management to maintain their health status and functioning. Specific focus should be applied to people with multiple chronic conditions. (p. 263)

In this context, Mokdad et al. (2004) asserted that physical inactivity and dietary risks were second only to tobacco use in preventable causes of death among Americans. Importantly, the effects of these critical risk behaviors are expected to overtake tobacco use quickly as factors contributing to chronic disease related deaths (Olshansky et al., 2005). Olshansky et al. postulated:

Trends suggest that the relative influence of obesity on the life expectancy of future generations could be markedly worse than it is for current generations. In specific, these researchers suggest that the life-shortening effect of obesity could rise from its current level of about one third to three fourths of a year to two to five years, or more, in the coming decades as the obese who are now at younger ages carry their elevated risk of death into middle and older ages. As a consequence of these findings, health educators, clinicians and other public health professionals have been challenged in their efforts to increase attention and bring action to bear on addressing the consequences associated with preventable chronic disease. (p. 1141)
In an effort to address the impact of risk behaviors associated with chronic disease, Remington and Brownson (2011) described the significant reduction in smoking in the U.S. as one of the most important successes achieved by health professionals since the 1960s. By comparison, such efforts have been less successful when addressing obesity in the US. As a result, the obesity rate in the United States among both adults and children has more than doubled the past four decades (Centers for Disease Control [CDC], 2013c).

According to the CDC (2012e), overweight and obesity are labels used to identify ranges of personal body weights that have shown to fall outside of the range demonstrated to be essential for best health outcomes. Among adults, overweight and obesity are defined using Body Mass Index (BMI) measurements. The body mass index of an individual is calculated by analyzing the height and weight of a person. In specific, BMI is calculated using the formulas shown in Table 1 for weight and height in pounds and inches, as well as in kilograms and meters. Over time, this calculation has been simplified through the use of charts containing BMI scores to reflect the following:

\[
\text{Formula: weight (lb) / [height (in)]^2} \times 703\]
\[
\text{Formula: weight (kg) / [height (m)]^2}\]

For adults, BMI scores can be interpreted as shown in Table 1 (CDC, 2012e).
Table 1

*Body Mass Index*

<table>
<thead>
<tr>
<th>BMI</th>
<th>Weight Status</th>
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<tr>
<td>Below 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>Normal</td>
</tr>
<tr>
<td>25.0-29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>30.0 and Above</td>
<td>Obese</td>
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Public health concerns about overweight and obesity demand attention due to the numerous potential health complications associated with obesity for people at any age. Such potential complications include, but are not limited to hypertension, hypercholesterolemia, cardiovascular disease, and diabetes (Brophy et al., 2009). In this context, more than 25 million Americans have been diagnosed with Type 2 Diabetes Mellitus. In addition, 27 million also have been diagnosed with chronic heart disease and 68 million Americans have been diagnosed with hypertension (Robert Wood Johnson Foundation [RWJF], 2012).

In addition, obesity has been associated with such complications as osteoarthritis and musculoskeletal problems (Anandacoomarasamy, Fransen, & March, 2009) and sleep apnea and other respiratory problems (De Sousa, Cercato, Mancini, & Halpern, 2008). Obesity also has been associated with some forms of cancer including endometrial, breast, prostate, pancreatic, esophageal, kidney, liver, gallbladder, and colon cancers.
(Percik & Stumvoll, 2009). Further, it has been associated with depression, anxiety, and lower quality of life (Fontaine & Barofsky, 2001; Luppino et al., 2010).

Unlike infectious diseases that are caused by specific pathogen or organisms, chronic disease such as overweight and obesity have been shown to be related to lifestyle habits. Such lifestyle habits as physical activity and healthy dietary behaviors have been shown to lower the risk among children and adults of becoming obese (Office of the Surgeon General, 2010).

In recent decades, obesity has become a worldwide epidemic. The World Health Organization reports that overweight and obesity is the fifth leading cause of global deaths (World Health Organization [WHO], 2012). The World Health Statistics Report (2012) produced by the WHO, contains confirmation that the international prevalence of obesity almost has doubled between the years of 1980 and 2008. While five to eight percent of men and women in the world were reported to be obese in 1980, by 2008, these rates had increased to include 10% of men and 14% of women who met obesity criteria. Importantly, the region of the world confirmed to have the highest prevalence of overweight and obesity was in the Americas. In specific, when both males and females in this region are included, 62% of the population was found to be overweight. Further, 26% of this population was found to be obese when both males and females are included. By contrast, the area with the lowest prevalence of overweight and obesity was the South-East Asia Region. In South-East Asia, 14% of the male and female populations are in the overweight category and three percent of the population was in the obese category (WHO, 2005).
With a specific focus on the United States, the work of Ogden, Carroll, Kit, and Flegal (2012) has confirmed that more than one third of adults in the United States (35%) are obese. Importantly however, this study highlighted disparities in rates of overweight and obesity across the U.S. This study clarified that obesity rates also vary based on socioeconomic status. Both non-Hispanic Black and Mexican-American men and women in general with higher income are less likely to be obese than their lower-income counterparts. Further, among women, those with college degrees are less likely to be obese than their less educated counterparts. In addition, research has revealed that between 1988-1994 and 2007-2008, obesity prevalence in adults in the U.S. increased across all incomes and education levels (Ogden, & Carroll, 2010).

In 2011, research demonstrated that obesity rates vary also by geographical area within the U.S. Specific rates of obesity range from a low of 20.7% in the state of Colorado to 34.9 % in Mississippi. Ogden, Lamb, Carroll, and Flegal (2010) also confirmed that obesity rates vary by region of the country. The highest prevalence of obesity found in the U.S. occurs in the south (29.5%). Not far behind is the Midwest region with 29% prevalence. By contrast, the prevalence of obesity in the northeast and west are lower than their counterpart regions with 25.3% and 24.3% of the population in these regions being obese, respectively.

**Obesity in Ohio**

According to the Ohio State Nutrition, Physical Activity and Obesity Profile (2012c) published by the Centers for Disease Control and Prevention, 65% of the adult population in the Midwestern state of Ohio is overweight. In Ohio, it is predicted that in
the next 20 years, obesity will contribute to 1,599,091 new cases of Type 2 diabetes. Further, 3,398,949 new cases of coronary heart disease and stroke will be related to obesity in the state. Finally, it is anticipated that 3,087,951 new cases of obesity related hypertension and 1,969,998 new cases of arthritis will emerge (RWJF and Trust for America’s Future, 2012).

Such evidence confirms that the national overweight and obesity trend is reflected among residents of the state of Ohio. Importantly, with no significant interventions to change this trend, adult obesity in the state is predicted to reach 59.8% of the population by 2030. In 2011, 29.6% of adults are classified as obese. These increasing rates of obesity in the state of Ohio will ultimately mean an increase in obesity-related health care costs (CDC, 2009a). Among those currently falling into the overweight and obese category in the state of Ohio are many children and adolescents. According to the Youth Risk Behavior Survey, 15% of Ohio’s adolescent population was overweight and 12.4% obese (CDC, 2009a).

While overweight and obesity are defined clearly for adults, the same cannot be said for the definitions of overweight and obesity among children. There is a worldwide debate regarding how to accurately measure and define obesity for children. According to Kuczmarski, Ogden, and Grummer-Strawn (2000), there is a need for a unified and consistent definition of childhood obesity and overweight for better analysis of the research data. This lack of consistency is evident when comparing the definitions used in Europe and the United States. Among European children, obesity is based on age and gender specific BMI percentiles calculated from data collected. In this context, the
French recognize the 90th and the 97th percentile as classifications to indicate overweight and obesity in children. In the U.S., the standard has been established by the U.S. 2000 CDC Growth Charts (Kuczmarski et al., 2000) based on data from four national health examinations conducted between 1963 and 1994. The National Health examinations report recommendation is the use of BMI-for-age (body mass index) 85th percentiles for “at risk for overweight” and 95th percentile for overweight for children and adolescents over 2 years old. The WHO (1995) recommends the use of the U.S. BMI 85th percentiles for international use.

Specifically, there is concern about such an upward trend in these diseases in countries that traditionally have had low rates of overweight and obesity among children. This trend is particularly evident in countries in Eastern Europe (Lissau, 2004). For example, in Hungary, reports confirm that 20% of children between 11 and 14 years are obese. Further, 6% of these children already have been diagnosed with hypertension (WHO, 2005). Also, according to WHO estimates (2005), childhood overweight and obesity in Africa in 2010 was 8.5% and expected to reach 12.75% by 2020. Finally, in Asia, overweight and obesity prevalence is 4.9%, although due to the large population, the actual number of children affected reaches 18 million.

According to Ogden, Carroll, Curtin, Lamb, and Flegal (2010) and the CDC (2012e) growth charts, one of every six U.S. children and adolescent aged 2-19 is obese (as defined by CDC growth charts as having BMI greater than or equal to 95th age and gender specific percentiles). Specific to Ohio, the CDC’s Ohio State Nutrition, Physical Activity and Obesity Profile (2012) 15% of Ohio’s adolescent population were
overweight and 12.4% obese (CDC, 2009a). Among Ohio’s children aged 2 years to less than 5 years, 15.8% were overweight and 12.4% were obese (CDC, 2010a).

Childhood obesity alone is credited with accounting for approximately $14.1 billion in costs in the United States (RWJF and Trust for America’s Future, 2012). According to the same report, obesity related costs are at a rate predicted to raise parallel to the increasing rates of obesity. Importantly, if interventions can lower the body mass index of the population successfully, by 5%, this change will approximate health care cost savings of 7.6%. The same report approximates health care cost savings of $26,328,000,000 by 2030 (RWJF and Trust for America’s Future, 2012).

On a more positive note, the Centers for Disease Control and Prevention’s 2012 report on the trends in the prevalence of extreme obesity among U.S. Preschool-Aged children living in low-income families (1998-2010) confirmed that although from 1998-2003 the prevalence of obesity among this population increased from 13.05%–15.21%, from 2003-2010, it decreased slightly from 15.2% to 14.94% (CDC, 2012a).

**Health Consequences of Obesity in Children**

Like among adults, childhood obesity presents a global health concern. In recent years, children worldwide have been diagnosed with increasing rates of obesity related chronic diseases. Previously reserved for the adult population, these conditions include heart disease, hypertension and diabetes (WHO, 2005). In context of escalating prevalence rates, there is significant evidence documenting the deleterious health consequences of overweight and obesity among children. Although chronic diseases
traditionally are associated with the adult population, the risk factors associated with
disease such as hypertension, cholesterolemia, and Type 2 diabetes could originate as
early as childhood (Brophy et al., 2009). Gardner et al. (2009) showed that weight at age
5 can be a predictor of future health issue consequences including diabetes and
cardiocvascular disease (Gardner et al., 2009).

Overweight and obesity consequences and related conditions burden not only the
health care system through its effect on physical health, but also children’s mental and
social health. In this context, research has documented the increasing negative impact of
such mental health concerns as low self-esteem (Strauss, 2000), social discrimination,
depression, and negative body image (Zametkin, Zoon, Klein, & Munson, 2004).

Due to the concerns demonstrated to be related to childhood obesity, Healthy
People 2020 has specified a goal to address childhood obesity. The goal is to reduce
prevalence of obesity by 10% from 2005-2008 levels among youth aged 2-19 years and
to bring overall prevalence down to 14.6% by 2020. More specifically, Healthy People
2020 goals identify age specific targets as 9.6% among children aged 2-5 years, 15.7%
among children aged 6-11 years, and 16.1% among adolescents aged 12-19 years

Specifically, Healthy People 2020 places a spotlight on the priority areas of
adolescent health, physical activity, and nutrition and weight status, as well as early and
middle childhood as some of the new topics of focus in the national 10-year plan. In
addition to the identification of general areas for priority, Healthy People 2020 identified
specific objectives related to youth physical activity, dietary behaviors, academic
achievement, and social support. These objectives relate specifically to the roles of schools in providing support in addressing these issues. Below are some of these objectives (USDHHS, 2013).

- **PA-4**: In the *Healthy People 2020* document specifically states the goal of increasing the proportion of the Nation’s public and private schools that require daily physical education for all students
- **PA-5**: Increasing the preparation of adolescents who participate in daily school physical education
- **PA-6**: Increasing regularly scheduled elementary school recess in the United States
- **PA-10**: Increasing the proportion of the Nation’s public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours

Similar to physical activity, dietary behavior also plays an important role in the development of chronic disease associated with overweight and obesity (CDC, 2011a). An American Academy of Pediatrics (AAP) endorsed report by the American Heart Association (AHA) et al. (2006) provided a series of dietary recommendations for children and adolescents. Among these recommendations is a balance between dietary calories intake and physical activity to maintain growth. Sixty minutes of moderate to vigorous physical activity daily, eating vegetables and fruit daily and limiting juice intake, eating whole grain brands and cereal rather than refined grain products, reducing the intake of sugar-sweetened beverages and foods, using nonfat (skim) or low-fat milk
and other dairy products, eating more oily fish, and reducing dietary salt intake are just some of the recommendations (AHA et al., 2006).

In addition, the above-mentioned 2006 American Heart Association report supports the notion that family, friends, and schools have a role to play in children’s nutrition (AHA et al., 2006). The AHA report suggests that parents choose meal times, not children; provide a variety of nutrient dense foods such as fruits and vegetables, paying attention to portion size; use non-fat daily products; teach about food and nutrition during daily activities such as grocery shopping or cooking meals; and limit snacks as strategies to improve child nutrition. The AHA report suggests also that schools play a role through healthy nutrition programs, identifying and developing policies to promote student health, making healthful foods available at school and school functions, and banning food advertising on school campus (AHA et al., 2006).

Healthy People 2020 specify the following objectives to improve the dietary behaviors among children in the U.S.:

- NWS-2: Increase the proportion of schools that offer nutritious foods and beverages outside of school meals
- NWS-11: (Developmental) Prevent inappropriate weight gain in youth and adults
- NWS-15: Increase the variety and contribution of vegetables to the diets of the population aged 2 years and older
- NWS-17: Reduce consumption of calories from solid fats and added sugars in the population aged 2 years and older
Schools and Obesity

The National Center for Education Statistics (NCES) Digest of Education Statistics (2012) reports published by the U.S. Department of Education that record levels of elementary and secondary school enrollment are being forecasted starting in year 2012 (54.9 million) through at least 2020 (57.9 million), reflecting an increase in the school-age population. The sheer number of students attending schools makes the education enterprise an ideal venue for developing interventions targeting the health issues of children and adolescents. Students are in schools for an average of 6 hours each day, for a span of 13 years. These school-age years, according to the U.S. Department of Education, Institute of Education Sciences (2010), are critical for social, psychological, physical, and intellectual development.

In the Physical Activity Guidelines Advisory Committee Report (2008) published by the U.S. Department of Health and Human Services, physical activity is defined as “any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a resting level. It can be repetitive, structured and planned; leisurely, sports focused; work-related; or transportation-related.” At school physical activity can happen in the form of physical education, recess, and during classroom instruction (Mahar, Kenny, Scales, Shields, & Miller, 2006), as well as before and after school activities (organized or spontaneous, school related or not), transportation to and from school, and play.

The increasing prevalence of adults, adolescents, and children suffering from these diseases has been linked to lifestyle factors and other environmental factors such as
physical inactivity and poor diet (USDHHS, 2008). Strong scientific evidence shows that physically active people have lower rates of various chronic diseases such as mentioned above and that health status of children and youth are enhanced by frequent physical activity (USDHHS, 2008). The report recommends that children obtain one hour or more of physical activity daily consisting mostly of moderate or vigorous intensity aerobic activity (and vigorous intensity physical activity at least 3 days per week) with some part of the 60 minutes of daily physical activity to include muscle-strengthening activity (at least 3 days per week) and some bone-strengthening activity (at least 3 days per week; USDHHS, 2008).

*Healthy People 2020* objectives for educational and community based programs (including school-based programs) related to children’s physical activity and dietary behaviors included:

- **ECBP-2**: Increase the proportion of elementary, middle, and senior high schools that provide comprehensive school health education to prevent health problems in the following areas: unintentional injury; violence; suicide; tobacco use and addiction; alcohol or other drug use; unintended pregnancy, HIV/AIDS, and STD infection; unhealthy dietary patterns; and inadequate physical activity

- **AH 6**: Increase the proportion of schools with a school breakfast program

Healthy eating, including eating breakfast, has been shown to enhance learning and achievement (Rampersaud, Pereira, Girard, Adams, & Metzl, 2005; Taras, 2005). The Centers for Disease Control and Prevention’s School Health Guidelines to Promote
Healthy Eating and Physical Activity Report (2011a) confirms these findings. The CDC’s School Health Guidelines Report also provides general recommendations to schools’ health programs to promote healthy eating and physical activity.

Among these recommendations, the following relate to healthy eating at schools:

• Using a coordinated approach to developing, implementing and evaluation healthy eating and physical activity policies and practices in schools;
• Creating school environments that are supportive of healthy eating and physical activity;
• Providing a quality school meal program and ensuring that students have only appealing, healthy food and beverage choices offered outside of the school meal program;
• Implementing health education programs to provide students with knowledge, attitudes, skills and experiences needed for healthy eating;
• Providing students with health, mental health and social services to address healthy eating related chronic disease prevention;
• Partnering with families and community members in the development and implementation of healthy eating policies, practices and programs;
• Providing a school employee wellness program that includes healthy eating services for all school staff members; and
• Employing qualified persons, and provide professional development opportunities for physical education, health education, nutrition education, nutrition services and health, mental health and social services staff members.
While Raphael (1998) confirmed that schools can play an important role in developing interventions to address the health concerns of children, in fact, it is important to note that schools are academically focused. This academic focus is therefore their main objective. According to the Centers for Disease Control’s Division of Adolescent School Health report on the association between school based physical activity and academic achievement (2010b) and other supporting literature such as Basch’s (2010) “Healthier Students Are Better Learners,” a clear link has been established between physical health and physical activity and the academic achievement, making the health of students an important and relevant issue for schools. A significant concern related to overweight and obesity is the potentially negative effects these conditions exert on academic performance among school-aged youth.

Academic performance traditionally is measured using individual grade point average (GPA) or standardized test performance for each student or school. Links between childhood overweight and obesity and academic achievement have been documented in the literature and are discussed later. Overweight and obesity among children has been shown to not only increase risk for children to present and/or to increase predispositions to many physical health issues later in life, but it has also been linked to mental and social health issues such as low self-esteem, depression, and peer discrimination (Strauss, 2000). These are all issues that can influence a child’s ability to perform both socially and physically and have life-long effects. In recent years, health educators and public health professionals, supported by governmental funding and programming such as the recent First Lady Michelle Obama’s initiative Let’s Move (n.d.)
and Healthy People 2020 initiatives (USDHHS, 2013), have shifted their attention and resources on this very important issue.

*Healthy People 2020 includes also an objective related to academic achievement.*

This objective states as follows:

- AH-5: Increase educational achievement of adolescents and young adults

**Social Support**

According to House (1981), social support is the “functional content of relationships that can be categorized into four broad types of supportive behaviors or acts: emotional support, instrumental support, informational support, and appraisal support” (Glanz, Rimer, & Viwanath, 2008, p. 190). Emotional support involves empathy, love, trust, and caring; instrumental support involves tangible aid and services that assist a person in need; informational support is providing advice, suggestions, and information that can be useful in addressing a problem; and appraisal support is providing constructive feedback and affirmation (House, 1981). While these can be identified independently, they are often studied as a whole as they are difficult to differentiate in practice (Glanz et al., 2008).

According to Berkman and Glass (2000), social support might have a positive impact on health. They have created a model that hypothesizes that social support and the broader social networks may have a direct effect on health by meeting basic needs of companionship and intimacy, providing a sense of belonging, and reassuring self-worth, as well as providing supportive ties regardless of stress levels.
The Purpose of the Study

The purpose of this study was to analyze the impact of social support and selected demographics on physical activity, dietary behavior, and academic achievement among middle and high school students.

Research Questions

1. Is there a relationship between Dietary Social Support and Dietary Behavior when Physical Activity is considered?
   a. If yes, will this relationship be influenced by age and sex?

2. Is there a relationship between Dietary family, friends, and/or school social support and dietary behavior?
   a. If yes, will this relationship be influenced by age and sex?

3. Is there a relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered?
   a. If yes, will this relationship be influenced by age and sex?

4. Is there a relationship between Physical Activity family, friends, and/or school social support and physical activity?
   a. If yes, will this relationship be influenced by age and sex?

5. Is there a relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered?
   a. If yes, will this relationship be influenced by age and sex?
b. If yes, are both social support variables (Physical Activity and/or Dietary Behavior) significant?

**Definition of Terms**

*Academic achievement.* Self-reported grade (CDC, 2012d).

*Childhood obesity.* In the U.S., the standard is the U.S. 2000 CDC Growth Charts (Kuczmarski et al., 2000), which uses the data from four national health examinations from 1963 to 1994. Its recommendation is the use of BMI-for-age (body mass index) 85th percentiles for “at risk for overweight” and 95th percentile for overweight for children and adolescents over 2 years old.

*Dietary behaviors.* Health behaviors related to nutrition (CDC, 2012d).

*Obesity.* According to the CDC (2012f), obesity is a label used to identify ranges of weight that have shown to be outside the healthy range. A body mass index above 30.0 is considered obese.

*Overweight.* According to the CDC (2012f), overweight is a label used to identify ranges of weight that have shown to be outside the healthy range. A body mass index of 25.0–29.9 is considered overweight.

*Physical activity.* Physical activity is body movement of any type and may include recreational fitness, sport activities, and activities of daily living (Ballard et al., 2005).

*Social support.* Aid and assistance exchanged through social relationships and interpersonal transactions. There are various types of social support, such as emotional support (expression of empathy, love, trust and caring); instrumental support (tangible aid
and services); informational support (advice, suggestions and information); and appraisal support (information that is useful for self-evaluation; Glanz, Rimer, & Viswanath, 2004).

_Social support (family)._ Social support (see above) as it relates to family members (Sallis et al., 1987).

_Social support (friends)._ Social support (see above) as it relates to peers (Sallis, Grossman, Pinski, Patterson, & Nader, 1987).

_Social support (school)._ Social support (see above) as it relates to the overall school environment (Adolescent Health Research Group [AHRG], 2012).

**Basic Assumptions**

1. Students at the selected school have access to extensive physical activity programing.

2. Subjects will respond truthfully to the survey questions.

3. Parental and student consent will represent their willingness to participate in the study.

4. Students are free to leave items blank in the survey.

5. Items to which students do not provide responses in the instrument are not included in the analysis.
CHAPTER II

LITERATURE REVIEW

The Purpose of the Study

The purpose of this study was to analyze the impact of social support and selected demographics on physical activity, dietary behavior, and academic achievement among middle and high school students.

Introduction

Research based on ecological models reveals that the condition of overweight and obesity are not determined only by individual characteristics, but also by the environmental contexts in which an individual exists. In this regard, Bronfenbrenner (1979) has asserted that a key environmental context for children and adolescents is the school environment. In this context, the built environment, food, and physical activity programs and policies are school-based variables of influence.

Further, school characteristics including school size, school socioeconomic factors, school policies, and school culture exert and impact student physical activity levels and opportunities for physical activity (Leatherdale, Manske, Faulkner, Arbour, & Bredin, 2010; Naylor, Macdonald, Warburton, Reed, & McKay, 2008; Veugelers & Fitzgerald, 2005). In support of such contentions, research among adolescents suggests that the school environment is an important factor in the context of weight status (Dunton, Kaplan, Wolch, Jerrett, & Reynolds, 2009).

According to Leatherdale (2013), school programming can exert an impact on children’s health. It is therefore important to explore further the relationships between
the school environment and overweight and obesity in children. Research conducted by Leatherdale among students in grades 1 to 4 revealed that individual student weight status varies depending on the school the student attends. In this context, Leatherdale’s research expanded the findings of Veugelers and Fitzgerald (2005) who examined the impact of school programming on the health of older elementary school children.

In conclusion, schools expose children to nutrition and physical activity programs and policies. In addition, most schools provide some form of health education and physical education through the formal instructional curriculum. Schools provide further nutrition and nutrition education through the foods and beverages available to students before, during, and after school. Further, the social network that the school represents to students, including teachers, administrators, coaches, and peers, has an influential role to play in students’ health (Khambalia, Dickinson, Hardy, Gill, & Baur, 2012).

**Obesity Among Youth: The National Response**

**The Healthy People Initiative**

In the U.S., Federal initiatives have been developed and implemented to address population health issues. Among these, overweight and obesity among adults and children are addressed in context of the Healthy People agenda. The Healthy People agenda was created as a “national” initiative. This initiative includes participation and input from both governmental and non-governmental organizations, professional associations, health agencies, and multiple agencies of the federal government. This reinforced its longevity and sustainability (Green & Fielding, 2011). The Healthy People initiative serves three purposes: setting national objective and goal, identifying baseline
data and quantifiable targets for the described objectives, and monitoring and evaluating progress (Koh et al., 2011).

The publication of Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention in 1979 focused on defining health promotion as a concept and on preventive health services (Green, McGinnis, Phillips, Devereaux, & Montes, 1981). The biggest challenge in creating this first document was the lack of evidence to establish a baseline for the goals and objectives. According to Green and Fielding (2011), this first document created a framework from which to build the literature in the future.

The following three editions, Healthy People 2000, 2010, and 2020, worked to identify priorities driven by quantifiable baselines. Three main goals guided the Healthy People 2000: National Health Promotion and Disease Prevention Objectives efforts. These goals were to: (a) increase the span of healthy life, (b) reduce health disparities, and (c) achieve access to preventive services (National Center for Health Statistics [NCHS], 2001). The topic areas and objectives in the Healthy People documents have increased in number and specificity over time. Along with these broad goals, Healthy People 2000 set 319 specific objectives for the nation. In 2001, the final review of this ambitious effort found that over 60% of the objects were achieved including reducing the number of deaths from coronary heart disease and cancer, as well as incidence of some sexuality transmitted diseases such as AIDS and syphilis (NCHS, 2001).

In 2000, Healthy People 2010: Understanding and Improving Health was just being released and the results of Healthy People 2000 were being analyzed. Following
the relative success of *Healthy People 2000, Healthy People 2010* built on the two preceding documents. The overarching goals of *Healthy People 2010* were to: (a) increase quality of life and years of healthy life, and (b) eliminate health disparities. Along with these broad goals, *Healthy People 2010* also included 467 specific objectives in 28 priority areas (NCHS, 2001). Also unique to this iteration of the Healthy People initiative was a set of 10 Leading Health Indicators, designed to serve as indicators of national priorities: Physical activity, overweight and obesity, tobacco use, substance abuse, responsible sexual behavior, mental health, injury and violence, environmental quality, immunization, and access to health care (NCHS, 2001). These overarching goals and leading health indicators reflect the shift in focus for national dialogue away from traditional infectious diseases and toward chronic diseases, quality of life, and prevention (USDHHS, n.d.).

The latest iteration of the document, *Healthy People 2020*, emphasizes a social determinant’s perspective including biology, behaviors, social and physical environment, policies, and interventions (Koh et al., 2011). *Healthy People 2020* explores further this focus on chronic disease and disease prevention by specifying the following overarching goals:

- Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death.
- Achieve health equity, eliminate disparities, and improve the health of all groups.
- Create social and physical environments that promote good health for all.
• Promote quality of life, healthy development, and healthy behaviors across all life stages. (USDHHS, 2013)

These overarching goals are further subdivided by categories and addressed by 39 topic areas. Among these topic areas, four address goals specific to middle and high school children’s health. These topic areas are:

- Adolescent Health
- Early and Middle childhood
- Nutrition and Weight Status and
- Physical activity. (USDHHS, 2013)

Reflecting an increased focus on child and adolescent health, of the four topic areas described above, two are new to this iteration of Healthy People. Adolescent Health and Early and Middle Childhood topic areas have been included in the Healthy People initiative in 2020, further emphasizing the critical role of childhood health on the overall health of the Nation. Further, specific objectives targeting school are also included in Healthy People 2020. Among these objectives are:

- NWS-2. Increase the proportion of schools that offer nutritious foods and beverages outside of school meals
- NWS-11. (Developmental) Prevent inappropriate weight gain in youth and adults
- NWS-15. Increase the variety and contribution of vegetables to the diets of the population aged 2 years and older
• NWS-17. Reduce consumption of calories from solid fats and added sugars in the population aged 2 years and older
• ECBP-2. Increase the proportion of elementary, middle, and senior high schools that provide comprehensive school health education to prevent health problems in the following areas: unintentional injury; violence; suicide; tobacco use and addiction; alcohol or other drug use; unintended pregnancy, HIV/AIDS, and STD infection; unhealthy dietary patterns; and inadequate physical activity
• AH 6. Increase the proportion of schools with a school breakfast program
• AH-5. Increase educational achievement of adolescents and young adults (USDHHS, 2013)

The primary social function of schools is developing children and adolescents’ cognitive skills. These skills are often measured in terms of academic achievement. In specific, academic achievement is addressed in Healthy People 2020 in the form of objectives AH-5 and AH-6. Objective AH-5 is to “increase educational achievement of adolescents and adults.” This objective contains 6 sub-goals. Among these sub-goals is sub-goal AH-5.6: decrease school absenteeism among adolescents due to illness and injury. According to the National Health Interview Survey by the Centers for Disease Control and National Centers for Health Statistics, it was reported in 2008 that 5% of adolescents aged 12 to 17 years missed 11 or more whole school days due to illness or injury in the previous 12 months. The objective sets a 10% improvement target (USDHHS, 2013).
Healthy People 2020 objectives confirm the link between academic achievement and nutrition; by including objective AH-6 which focuses on increasing the proportion of schools with a school breakfast program. According to the School Health Policies and Practices Study (SHPPS) conducted by the Centers for Disease Control, in 2006, 68.6% of schools overall, including public and private elementary, middle and high schools, had a school breakfast program. The target for this objective is for a 10% improvement, increasing it to 75.5% of schools with a school breakfast program by 2020 (USDHHS, 2013).

Healthy People created the need for programs and policies to provide evidence-based data for setting the objectives. Further, programs and policies were also needed to help achieve the national goals and objectives (Green & Fielding, 2011). Initiatives, including the Physical Education for Progress Act (PEP), The White House Taskforce on Childhood Obesity, the Let’s Move! Campaign, the Centers for Disease Control, the Institute of Medicine, and other programs expand on these goals and objectives, provide recommendations on how to achieve the objectives set by the Healthy People agenda, and provide funding sources for programs focused at addressing these objectives.

Physical Education for Progress Act (PEP)

A Federal initiative designed to address overweight and obesity among school aged children in the U.S. is the U.S. Department of Education’s Carol M. White Physical Education Program (PEP) which provides grants to LEAs (Local Educational Agencies) and CBOs (Community Based Organizations) to enhance physical activities in children
and adolescents in kindergarten through 12th grade. The PEP Act was introduced on May 27, 1999, by Senator Ted Stevens (R-AK). On December 15th, 2000, the U.S. Congress approved a spending bill that included a $5 million appropriation for the Physical Education for Progress (PEP) Act (U.S. 1159: Physical Education for Progress Act, 1999). This Act stipulates that grant dollars can be used for equipment purchases, teacher training and education, and providing support and accessibility to students to participate in physical education (U.S. Department of Education [USDE], 2012). In 2013, 60 grants were awarded ranging from $145,000 to upward of $700,000 distributed among 60 sites throughout the country (www2.ed.gov/whitephosed/2013awards.html), with three Ohio schools among the recipients. Previous grants have been awarded to other Ohio schools as seen in Table 2.

Examples of activities and programs funded by PED grants include Buckeye Local Schools and East Knox Local Schools. Buckeye Local School district in Dillonvale, OH, was a 2011 recipient of a PEP grant for $387,022. The grant was awarded for the purpose of revising and aligning the PE curriculum, incorporating diverse equipment including adaptive equipment, providing professional development training opportunities for teachers, expanding opportunities for physical activity, and using a nutrition consultant to integrate nutrition education into the PE curriculum (USDE, 2012).
Table 2

*PEP Grant Ohio Recipients*

<table>
<thead>
<tr>
<th>Year</th>
<th>Ohio School Awarded the Grant</th>
<th>Amount Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Columbus Public Schools</td>
<td>$264,229</td>
</tr>
<tr>
<td>2002</td>
<td>New Philadelphia City Schools</td>
<td>$175,131</td>
</tr>
<tr>
<td></td>
<td>Fairfield City Schools</td>
<td>$315,000</td>
</tr>
<tr>
<td></td>
<td>Trotwood-Madison City Schools</td>
<td>$383,472</td>
</tr>
<tr>
<td></td>
<td>Cleveland Municipal School District</td>
<td>$413,703</td>
</tr>
<tr>
<td></td>
<td>Notre Dame School</td>
<td>$89,029</td>
</tr>
<tr>
<td>2003</td>
<td>Fairborn City Schools</td>
<td>$294,624</td>
</tr>
<tr>
<td></td>
<td>Columbus Public Schools</td>
<td>$300,513</td>
</tr>
<tr>
<td>2004</td>
<td>Marysville Exempted Village</td>
<td>$257,941</td>
</tr>
<tr>
<td></td>
<td>Toledo Public Schools</td>
<td>$298,167</td>
</tr>
<tr>
<td></td>
<td>Xenia Community City School</td>
<td>$251,847</td>
</tr>
<tr>
<td>2005</td>
<td>Cleveland Municipal School District</td>
<td>$272,419</td>
</tr>
<tr>
<td></td>
<td>Dayton Public Schools</td>
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</tr>
<tr>
<td></td>
<td>Bucyrus City Schools</td>
<td>$377,600</td>
</tr>
<tr>
<td>2006</td>
<td>Warren Local Schools</td>
<td>$170,833</td>
</tr>
<tr>
<td></td>
<td>Meigs Local Schools</td>
<td>$322,392</td>
</tr>
<tr>
<td></td>
<td>Summit Academy</td>
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</tr>
<tr>
<td></td>
<td>Fredericktown Local Schools</td>
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<tr>
<td></td>
<td>Hamilton City School District</td>
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<tr>
<td>2007</td>
<td>Jackson Local School District</td>
<td>$129,851</td>
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<tr>
<td></td>
<td>Mid Ohio ESC (Mansfield, OH)</td>
<td>$355,532</td>
</tr>
</tbody>
</table>

*(table continues)*
Table 2 (continued)

**PEP Grant Ohio Recipients**

<table>
<thead>
<tr>
<th>Year</th>
<th>Ohio School Awarded the Grant</th>
<th>Amount Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>Pleasant Local Schools (Marion, OH)</td>
<td>$325,982</td>
</tr>
<tr>
<td></td>
<td>Marietta Family YMCA</td>
<td>$265,378</td>
</tr>
<tr>
<td></td>
<td>Shadyside Local School District</td>
<td>$371,689</td>
</tr>
<tr>
<td>2009</td>
<td>Lorain City Schools</td>
<td>$473,124</td>
</tr>
<tr>
<td>2010</td>
<td>Kenston Public Schools</td>
<td>$677,706</td>
</tr>
<tr>
<td>2011</td>
<td>East Knox Local Schools (Howard, OH)</td>
<td>$363,087</td>
</tr>
<tr>
<td></td>
<td>Buckeye Local Schools (Dillonvale, OH)</td>
<td>$387,022</td>
</tr>
<tr>
<td>2012</td>
<td>Logan Hocking Local Schools</td>
<td>$ NA</td>
</tr>
<tr>
<td></td>
<td>Meigs Local School District</td>
<td>$ NA</td>
</tr>
<tr>
<td>2013</td>
<td>Southern Local Schools</td>
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<tr>
<td></td>
<td>Perry Local Schools</td>
<td>$762,811</td>
</tr>
<tr>
<td></td>
<td>Wickliffe City Schools</td>
<td>$384,522</td>
</tr>
</tbody>
</table>

The East Knox Local School in Howard, OH, provides another example of a recipient of a PEP grant in 2011, receiving $363,087. This school district, along with other community agencies including the Ohio State University Extension and the Knox County Health Department proposed to use the resources to improve and increase the daily physical activity, cardiovascular fitness levels, and healthy eating habits of students. This coalition proposed to achieve this goal, by conducting formative assessments of current PE classes, and through the implementation of a sequential, rigorous PE
curriculum. Further the school proposed to incorporate physical activity and nutrition concepts into classroom instruction and involving the community through developing a family night program (USDE, 2012).

**Let’s Move! Campaign**

Launched in 2010 by First Lady Michelle Obama and with the support of the U.S. Department of Health and Human Services, the U.S. Department of Agriculture (USDA), the Department of Education and the Department of Interior, the *Let’s Move!* Campaign is a comprehensive initiative to address important issues related to childhood obesity in the U.S. In specific, the *Let’s Move!* Campaign focuses on addressing and implementing recommendations identified by the White House Task Force on Childhood Obesity Report to the President (*Let’s Move!*; n.d.). The overarching goal of the *Let’s Move!* Campaign is increasing physical activity as a part of a healthy lifestyle among the U.S. population, specifically among children and adolescents (*Let’s Move!*; n.d.). This campaign encourages creating opportunities for physical activity both in and out of schools, as well as involving the whole family and community. “*Let’s Move!* is dedicated to solving the challenge of childhood obesity within a generation, so that children born today will grow up healthier and able to pursue their dreams” (*Let’s Move!*; n.d.).

Asserting that parents, schools, communities, the government, faith-based organizations, health care professionals, and private sector companies have a role to play in combating the growing problem of childhood obesity, the *Let’s Move!* Campaign has initiated various programs. Further, the campaign has made available resources to
parents, schools, communities, faith-based organizations, health care professionals and private sector companies.

In schools the *Let’s Move!* Campaign encourages and supports creating a school health advisory council, joining the HealthierUS Schools Challenge, and incorporating nutrition education and physical education into the school day. Further, the campaign suggests planting a school garden, implementing the Chefs Move to Schools program, and setting a good example by making the school a healthy workplace. A school health advisory council can assess the school’s health status and make policy recommendations on health-related issues in the schools. *Let’s Move!* recommends that an advisory council consists of students, parents, teachers, administrators, other school staffs, and community representatives (*Let’s Move!*, n.d.). The HealthierUS Schools Challenge is a nationwide award created to recognize schools that provide a healthier school environment through the promotion of healthy nutrition and physical activity.

Incorporating nutrition education and physical education is encouraged for all children by incorporating the subjects into the curriculum. An example is to teach children color by using fruits and vegetables, or taking a walk outside as a part of science class. A school garden also can be an opportunity to incorporate physical activity and nutrition education into the curriculum. Further, the foods available in schools are a key aspect of healthy school environment. The Chefs Move to Schools program matches schools with local chefs. The chefs work with the school food service staff to create nutritious and delicious meals. Finally, schools also are encouraged to create a healthy
work environment encouraging faculty and staff to be active, eat healthy, and creating worksite programs (*Let’s Move!, n.d.*).

The *Let’s Move!* Campaign also makes recommendations and provides support to communities and faith-based organizations. Communities can contribute to children’s health by holding farmers’ markets, participating in the Healthy Food Financing Initiative, creating a community garden, and supporting school initiatives. Farmers’ markets and community gardens are simple ways to bring healthy foods and nutrition education to the community. The Healthy Food Financing Initiative provides financing for providing communities with the local grocery or corner stores, farmers markets, or small grocery stores with healthy foods. This is aimed at eliminating food deserts, especially among inner-city communities (*Let’s Move!, n.d.*). Further, the *Let’s Move!* Cities, Towns and Counties program encourages local elected officials to sign up their town, city, or county and commit to goals addressing childhood obesity and be recognized as they accomplish the goals established by the *Let’s Move!* initiative (*Let’s Move!, n.d.*).

**White House Taskforce on Childhood Obesity**

Childhood obesity is a national health crisis, which affects not only the health of children, but contributes to substantial economic costs. These associated costs are apparent in the form of long-term medical costs (White House Task Force on Childhood Obesity Report to the President [WHTFCO], 2010). It is estimated that overweight in childhood incurs $3 billion per year in direct medical costs (Trasande & Chatterjee, 2009).
As part of the *Let’s Move!* Initiative, President Barack Obama established a Task Force on Childhood Obesity. “President Barack Obama established the first-ever Task Force on Childhood Obesity to develop and implement an inter-agency plan that details a coordinated strategy, identifies key benchmarks, and outlines an action plan to end the problem of childhood obesity within a generation” (WHTFCO, 2010). Melody Barnes, the Director of Domestic Policy Council, chaired the Task Force. Further, 12 federal agencies participated in the Task Force, including Departments of Agriculture, Defense, Education, Health and Human Services, Housing and Urban Development, Interior, Justice, and Transportation, as well as the Corporation for National and Community Service, the Environmental Protection Agency, the Federal Communications Commission, and the Federal Trade Commission (WHTFCO, 2010).

In 2010, The White House Task Force on Childhood Obesity Report to the President was published, confirming the magnitude of the child obesity problem. This report compiled by the Task Force on Childhood Obesity identified specific strategies for creating a healthy start on life for children in their homes and schools. These strategies include increasing opportunities for physical activity at home and at school and serving healthier school meals. In specific, the White House Task Force on Childhood obesity makes over 70 recommendations aiming at improving the health of children. The Task Force (2010) makes recommendations in the following areas:

- In early childhood efforts focus on prenatal care, education of pregnant women and new mothers regarding breastfeeding, nutrition and physical
activity, and increased opportunities for evidence based child nutrition and physical activity

- One groups of recommendations clustered round empowering parents and caregivers to demand the regimentation to the food and beverage industry, as well as entertainment industry to adopt meaningful nutrition standards for marketing to children and to limit licensing of popular characters for marketing to children. Further, includes recommendation regarding regularly measuring BMI and promoting and counseling parents and caregivers on healthy nutrition and physical activity programs (WHTFCO, 2010).

- The Task Force also makes recommendations regarding healthier foods in schools are made to encourage schools to promote healthier food options.
  - In specific, school food options should correspond federal standards for school meals, increased resources for school meals, provide technical assistance and outreach to school food service professional, upgraded cafeteria equipment, work with stakeholder to develop more innovative ways to encourage students to make healthier choices, connect school meals programs to local growers, align foods served a la carte with guidelines, encourage food companies to develop products that meet guidelines, increase availability of nutrition education in schools, promote good nutrition through afterschool programs and encourage use of school gardens among others.

  - Schools are encouraged to provide access to healthy, affordable food. It is recommended that this be accomplished by launching a multi-year,
multi-agency initiative to attain private funds to increase availability of healthy, affordable foods in underserved urban and rural communities. The Task Force also encourages local governments to create incentives to attract supermarkets and grocery stores to underserved neighborhoods. Further, communities are encouraged to promote efforts to provide fruits and vegetables through farmers’ markets and provide economic incentives to increase production of healthy foods such as fruits, vegetable and whole grain. Finally, it is encouraged that the effect of state and local sales taxes on less healthy and energy dense foods be examined.

- Schools also can increase levels of physical activity by encouraging the inclusion of strong physical activity components in local school wellness policies and updating the President’s Challenge program to ensure consistency with the Physical Activity Guidelines for Americans. Schools also can play a role by encouraging local and state education agencies to promote recess and physical activity breaks as well as increase the quality and frequency of sequential, age and developmentally appropriate physical education for all students as taught by certified Physical Education teachers. Further, schools can create partnerships between federal state and local agencies and communities including businesses to support programs including afterschool programs, which offer physical activity opportunities. Finally, schools can encourage interscholastic supports and decrease prohibitive costs of sports by curbing practices such as “pay to play” and encourage communities to
consider the impact of the built environment policies and regulations on human health; active transport should be encouraged between home, school and community.

- Further, federally-supported school meals and other foods sold in schools can also be improved through nutrition education and better overall school environment, as well as increasing physical activity by providing high quality physical education, recess and other opportunities for physical activity in and after school. In specific, improving facilities to make the environment more conducive to physical activity is recommended, demonstrating the importance of schools in solving the issue of childhood overweight and obesity.

**Mission: Readiness**

In 2010, Mission: Readiness, a non-profit, non-partisan organization of senior retired military leaders published a report titled “Too Fat to Fight.” The findings in this report served as a warning to Congress and to the American public as they described the compromised state of physical fitness of children and adolescents in the U.S. This report revealed that more than one quarter of all Americans ages 17–24 were unqualified for service in the U.S. military as a consequence of being overweight or obese (Mission: Readiness, 2010). The document concluded that these conditions and their consequences exert a negative impact on National security and jeopardize the “future strength of our military” (Mission: Readiness, 2010, p. 1).

In light of these findings, Mission: Readiness called on Congress to enact specific strategies. These strategies include:
• Removing junk food and any remaining high-calorie beverages from schools,
• Increasing funding for the school lunch programs, and
• Supporting the development, testing and implementation of proven interventions aimed to educate and encourage children to make healthy dietary and physical activity choices (Mission: Readiness, 2010, p. 7).

As a follow up to “Too Fat to Fight,” Mission: Readiness published “Still Too Fat to Fight” in 2012. According to this follow-up report, approximately one in four young adults remain unable to serve in the U.S. military due to excess body fat. This fact continues to emphasize overweight and obesity as a national security issue (Mission: Readiness, 2012). This report contains commendations for steps that were taken to address the issue of overweight and obesity among children. Examples of the steps already taken to address overweight and obesity in children include the USDA’s (U.S. Department of Agriculture) updating of nutrition standards for meals and competitive foods and beverages in schools. Importantly, however, Mission: Readiness continues to recognize that there is still much work to be done and urges Congress to support these efforts and allow the USDA to finalize the standards (Mission: Readiness, 2012).

To illustrate further how overweight and obesity exert a negative influence on both the health and productivity of U.S. citizens, The Conference Board, Inc., published “Are They Really Ready to Work?” in 2006. This report reveals that in a survey of employers, three quarters of respondents (76.1%) rated “making appropriate choices concerning health and wellness, e.g., nutrition, exercise, stress reduction, work-life effectiveness” as an “emerging issue.” Specifically, the conference board went on to
describe this emerging issue as “most critical” for future graduates as they enter the workforce. In conclusion, The Conference Board asserted that the impact of overweight and obesity on people entering the workforce is of concern due to the impact of rising health care costs for employees and their related effects on the financial bottom-line for their employers (The Conference Board et al., 2006).

**Centers for Disease Control and Prevention**

The Centers for Disease Control and Prevention (CDC), a part of the U.S. Department of Health and Human Services, is a Federal agency focused on conducting and supporting public health activities (CDC, 2013d). Its mission is to

- Protect America from health, safety and security threats, both foreign and in the U.S. Whether diseases start at home or abroad, are chronic or acute, curable or preventable, human error or deliberate attack, CDC fights disease and supports communities and citizens to do the same. (CDC, 2013d)

According to CDC’s School Health Guidelines to Promote Healthy Eating and Physical Activity (2011c) prevention aimed at decreasing overweight and obesity among U.S. population must start with young children (CDC, 2011c). Obesity in children and adolescents is influenced by many factors, among them the presence or absence of regular physical activity and healthy dietary behaviors (Daniels et al., 2005; UDHHS, Public Health Service and Office of the Surgeon General, 2010). Children and adolescents’ physical activity and dietary behaviors are in turn influenced by numerous factors. These factors include, but are not limited to their immediate environment, including family, friends, communities, schools, health-providers, faith-based
institutions, and the media (CDC, 2011c). According to the School Health Guidelines to Promote Healthy Eating and Physical Activity Report (2011c) by the Centers for Disease Control and Prevention, schools play a critical role in student health by providing, cultivating, and educating students about physical activity and dietary behaviors in a safe and supportive environment.

**Youth Risk Behavior Surveillance System**

One of the tools used by the Centers for Disease Control to determine and understand youth health risk behavior is the Youth Risk Behavior Surveillance System Survey (YRBSS). The YRBSS was created based on leading causes of morbidity and mortality among youths and adults in 1988. Following the initial assessment and a series of reviews, it was determined that all behaviors found to contribute to the leading causes of morbidity and mortality could be placed in 6 priority categories: (a) behaviors that contribute to unintended injuries and violence; (b) sexual behaviors that contribute to HIV infection and other sexuality transmitted diseases and unintended pregnancy; (c) tobacco use; (d) alcohol and other drug use; (e) unhealthy dietary behaviors; and (f) physical inactivity. The first draft of the YRBSS questionnaire was completed and reviewed in October 1989 (CDC, 2013e).

The YRBSS questionnaires are self-administered and in general are administered every other year nationally. In 1997, an in-depth review of the survey was conducted and as a result, the 1999 YRBSS questionnaire added 16 new questions and deleted 11 questions. Further, word changes were conducted to 14 questions. The 2013 YRBSS
questionnaires used in this study reflect these changes and additional minor changes the
CDC has made to the questionnaire since 1999 (CDC, 2013e).

According to the CDC (2013e), two test-retest reliability studies have been
conducted of the national YRBS questionnaire, with the most recent having been
conducted in 2000. In this study, the questionnaire was administered two times
approximately two weeks apart. Approximately one in five questions (22%) showed
significant differences between the two administrations of the questionnaire. The
problematic questions were reviewed and changed in subsequent versions of the survey
(CDC, 2013e).

**Coordinated School Health**

In 1987, Allensworth and Kolbe introduced the concept of comprehensive school
health. The authors described the concept as a way to promote physical, social, and
emotional education to students. Originally, it consisted of three components, including
school health services, school health education, and school health environment. It has
since been expanded to include eight components.

The CDC supports a Coordinated School Health (CSH) approach as one strategy
to improve the health and achievement of students currently enrolled in the U.S. school
system (CDC, 2013a). A coordinated school health approach consists of eight
components: health education; physical education; health services; nutrition services;
counseling, psychological and social services; healthy and safe school environment;
health promotion for staff; and family and community involvement (CDC, 2013a).
In the context of a coordinated school health, health education refers to providing students with a comprehensive, sequential health education curriculum for students from Pre-K to grade 12. A comprehensive health education curriculum based on the National Health Education Standards (NHES) focuses on providing students with the opportunity to acquire knowledge, attitudes, and skills. It also educates students in making lifelong health decisions about health enhancing and health promoting behaviors (CDC, 2013a).

Another component of CSH is physical education. In this context, physical education is considered a planned, sequential K-12 curriculum. The curriculum should be based on the national standards for K-12 physical education. Further, physical education should be delivered by a qualified and trained teacher (CDC, 2013a).

Health Services refers to school-based services that provide access or referral to basic health care services, including primary health care, physicians, nurses, health educators, and other health professionals. Further, school health services include providing emergency care for illness or injury and counseling opportunities (CDC, 2013a). Beyond basic health services, counseling, psychological, and social services also are important components of CSH. Similar to basic health services, these are provided to promote the mental, emotional, social, and psychosocial climate and culture and schools (CDC, 2013a). The key factors in all of these services is that they are provided by professionals specialized in each of these areas (CDC, 2013a).

Creating a healthy and safe school environment, including the physical and aesthetic surroundings as well as a health promoting school climate and culture, and providing health promotion for staff and involving students’ families and the community,
are also components of CSH. A healthy school environment includes a safe buildings and school grounds. Safe school environment also includes the feeling of personal physical, emotion, and social safety.

Another aspect of CSH is health promotion for staff. Schools focus mostly on student affairs; however the faculty and staff also contribute to the overall school environment. School health promotion for staff entails providing opportunities for staff to improve health through education, health assessments, and fitness activities. The key factor in all of these services is that they are provided by professionals who have specialized in each of these areas (CDC, 2013a).

Family and community involvement also is a key component of creating an overall healthy school environment. Family and community involvement refers to building support for programs, students, and staff to translate the in-school programs into everyday life. Support from family and the community can involve direct involvement in school programs, participation in wellness committees, and serving as a community resource (CDC, 2013a).

Another area in a coordinated school health approach is physical education. In this context, physical education provides students with the opportunity to learn skills and knowledge about physical activities. These skills and knowledge are based on the national standards for K-12 physical education. A planned and sequential physical education program provides students with skills for lifelong physical activity (CDC, 2013a).
The last component of CSH is nutrition services. The term *nutrition services* refers to healthy meals provided to students and staff. Access to healthy meals that address daily nutrition needs as provided by the U.S. Dietary Guidelines for Americans can be provided in schools by the meals available before, during, and after school as part of school breakfast and lunch program. Further, nutrition services also encompass other foods and beverages available to students by a la carte lines and vending machines.

School nutrition services facilities can also serve as a learning environment, providing a laboratory opportunity for nutrition and health education instruction. The key factors in all of these services is that they are provided by professionals who have specialized in each of these areas (CDC, 2013a).

**Coordinated School Health and Physical Activity**

**Physical Education and Physical Activity**


- It is recommended that children and adolescents complete 60 or more minutes of physical activity daily.
• Most of the 60 minutes or more per day of exercise should consist of moderate or vigorous intensity aerobic activity, with vigorous-intensity physical activity at least three days per week.

• Muscle strengthening and bone strengthening physical activity should also be included as part of the 60 minutes per day of daily activity on at least 3 days per week.

The National Association for Sport and Physical Education (NASPE) Position statement regarding guidelines for physical activity for children ages 5-12 (2013) supports and expands on the above guidelines by stating that:

• Children should participate in several bouts of physical activity lasting 15 minutes or more each day.

• Children should participate in a variety of age-appropriate physical activities designed to achieve optimal health, wellness, fitness and performance benefits, and

• Extended periods (periods of two hours or more) of inactivity are discouraged for children, especially during the daytime hours. (NASPE, 2013)

Although these specific recommendations are supported by multiple organizations, and despite the health benefits of physical activity, the 2011 National Youth Risk Behavior Survey (YRBS) found that only 29% of high school students participated in the recommended 60 minutes per day of physical activity on each of the 7 days before the survey. Further, boys were found to be more than two times as likely to participate in this level of recommended physical activity (38%) than the surveyed girls.
Further, Troiano et al. (2008) found that 42% of children and only 8% of adolescents engage in moderate to vigorous intensity activity for 5 of 7 days for at least 60 minutes each day when physical activity was measured by accelerometer.

Leading national professional and government organizations including the National Association for Sport and Physical Education (NASPE), the National Education Association (NEA), U.S. Department of Health and Human Services (USDHHS), White House Task Force on Obesity, National Association of State Boards of Education (NASBE), and National School Boards Association (NSBA) have called on schools to provide a comprehensive school physical activity program. A comprehensive school physical activity program provides students with opportunities for high-quality physical education and other physical activity before, during, and after school. Further, it encourages partnerships with families and communities to promote physical activity (NASBE, 2009; NSBA, 2012; NEA, 2010; NASPE, 2009; USDHHS, 1996; White House Task Force on Childhood Obesity, 2010).

**Physical Activity and Academic Achievement**

According to Dunkle and Nash (1991), hunger, physical and emotional abuse, and chronic illness are all factors that can influence student academic performance and in turn, academic success can serve as an indicator of the overall health of youth (Harper & Lynch, 2007). According to Basch (2010), “healthier students are better learners” (p. 11). Further, he said,

Even if health factors had no effect on educational outcomes, they clearly influence the quality of life for youth and their ability to contribute and live
productively in a democratic society. These are worthy goals for elementary and secondary education. Indeed, pursuing these goals is a moral imperative. (p. 5)

A 2013 review of 25 years of research supports a link between academic achievement and health behaviors in adolescents. Bradley and Greene (2013) reviewed 122 articles published in peer-reviewed journals between 1985 and 2010 to analyze and synthesize the evidence linking health behaviors and academic achievement. The result of this meta-analysis was reported for each health-risk behavior. One of the risk behaviors analyzed is physical activity. Thirteen studies focused on the relationship of physical inactivity and academic achievement. In all studies, physical inactivity was limited to school related activity, including physical activity during the school day and school related sports activity. In these studies, academic achievement was measured by grade point average (GPA), grades, and standardized test scores. Five of seven longitudinal studies and four of six cross-sectional studies reported an inverse relationship between physical inactivity and academic achievement. Further, four longitudinal studies examined if using additional time during the school day for physical education would have a negative impact on standardized scores. Results of all four studies showed no negative impact on scores when additional time was spent in physical education (Carlson et al., 2008, Nansel, Huang, Rovner, & Sanders-Butler, 2010; Sallis et al., 1999; Shephard, 1996).

Strengthening the argument for the needed increase in physical activity among school-aged youth is a growing body of literature that shows that students with generally higher levels of physical activity tend to have better overall health and higher academic
achievement (Castelli, Hillman, Buck, & Erwin, 2007; Chomitz et al., 2009; Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001; Eveland-Sayers, Farley, Fuller, Morgan, & Caputo, 2009; Grissom, 2005).

According to Vail (2006),

Academics and physical education used to exist in two separate universes, and never the twain did meet. Some educators continue to see them as competing factions, one fighting for the mind, the other for the body. These days, however, the demarcation between mind and body, between academic education and physical education is wavering. (p. 1)

This change is confirmed by the growing literature supporting the link between physical activity, including but not limited to physical education and academic achievement.

Several studies examine the relationship between physical activity and academic achievement. Many of these have shown positive relationships between physical activity and academic performance (Basch, 2010; Castelli et al., 2007; Themane, Koppes, Kemper, Monyeki, & Twisk, 2006). According to the Centers for Disease Control and U.S. Department of Health and Human Services Report titled “The Association Between School-Based Physical Activity Including Physical Education and Academic Achievement” published in 2010, physical activity affects the brain by increasing blood flow, cerebral capillary growth, increased oxygenation, growth of nerve cells in the hippocampus, increased neurotransmitter levels and development of nerve connections, density of neural network, and brain tissue volume. These physiological changes can be
associated with improved attention, improved information processing, storage and retrieval, enhanced coping, and reduced sensations of cravings and pain.

According to Tomporowski, Davis, Miller, and Naglieri (2008), exercise can be used to enhance cognitive development and mental processing important in academics and other life behaviors in children. Physical activity was found to be significantly and positively related to mathematics and reading in elementary school aged boys and girls in an investigation by Stevens, To, Stevenson, and Lochbaum (2008). Further, the authors found that when parents reported physical activity engagement by their children, there was a more positive influence on math and reading achievement than physical education participation. These findings supported earlier findings by Coe, Pivarnik, Womack, Reeves, and Malina (2006). Coe et al. found that whereas physical education did not increase academic achievement, physical activity or engagement that met the guidelines set forth by the Healthy People 2010 goals for vigorous physical activity was significantly related to academic achievement for 6th grade students.

Although the emerging literature links physical activity and academic achievement (Basch, 2010; Coe et al., 2006; Stevens et al., 2008), physical education classes and opportunities for physical activity during the school day is on the decline. Many school districts faced with budget cuts are reducing physical education requirements and many are completely eliminating programs (Thomas, 2004).

A study by Coe, Peterson, Blair, Schutter, and Peddie (2013) examined the association between physical fitness and academic achievement in third-, sixth-, and ninth grade students. This supported the findings of previous studies’ achievement
(Castelli et al., 2007; Chomitz et al., 2009; Dwyer et al., 2001; Eveland-Sayers et al., 2009; Grissom, 2005) in finding that sixth and ninth grade students with high fitness levels scored significantly better on Math and Social Studies tests when compared to their less fit peers.

A 2012 report by the Campaign for Healthy Schools and Trust for America’s Health titled “Health in Mind” concluded that health and fitness were linked to improved academic performance, cognitive ability and behavior, as well as reduced truancy (Healthy Schools Campaign and Trust in America’s Health, 2012). Physical activity in the context of schools can take many shapes including before and after school programs and physical education and recess. Research has shown that recess, although providing students with valuable time to be active during the school day, is a diminishing phenomenon. In the U.S., recess time has increasingly being diminished to make way for more instructional time nationwide (Olsen & Pace, 2013).

In 2013(a), a report by The Institute of Medicine’s Report titled “Educating the Student Body: Taking Physical Activity and Physical Education to School” addresses concerns about overweight and obesity. This report makes comprehensive and coordinated, whole-school specific recommendations on how to strengthen and improve programs and policies regarding physical activity and physical education. These recommendations include strengthening polices by requiring time for physical education and recess, increasing the amount of time spent in physical activity during the school day, offering intramural sports and physical activity before or after school, allowing school facilities to be used for physical activity programs during non-school hours, designating
physical education as a core subject, and addressing disparities in physical activity by ensuring equity in access to physical activity and physical education (IOM, 2013).

According to the Institute of Medicine’s (2013a) report, “time in school dedicated to recess, physical education class and physical activity in the classroom may facilitate academic performance.” The authors further stated that, “although academic performance stems from a complex interaction between intellect and contextual variables, health is a vital moderating factor in a child’s ability to learn” (IOM, 2013a, p. 129). The reported effects of physical activity on improving efficiency and executive functioning of the brain suggest that mathematics and reading are academic areas that are particularly influenced by physical activity (IOM, 2013a, p. 161). According to Tomporowski (2003), after participating in a physical activity session, students have better response time and accuracy when challenged with cognitive tasks. Further, when physical activity is used as tool in the classroom, research shows increased attention span (Bartholomew & Jowers, 2011), increased on-task behaviors (Mahar et al., 2006), and improved academic performance (Donnelly & Lambourne, 2011). Both chronic and single bout of physical activity has been shown to enhance academic performance (IOM, 2013a).

**Coordinated School Health Dietary Behaviors Nutrition Services**

Similar to the role it plays in encouraging and improving the level of physical activity for U.S. youth is the role of schools regarding nutrition. Before and during the school day, students are exposed to a variety of foods and beverages through school meals, a la carte lines, vending machines, school fundraisers, classroom celebrations, school stores, and other school events (CDC, 2012b). Nutrition standards and guidelines
for school meals that are federally reimbursable are regulated by the U.S. Department of Agriculture’s National School Lunch Program and School Breakfast Program (USDA, 2013). As a part of the Let’s Move! Campaign, the Hunger-Free Kids Act was passed in December 2010 to make reforms to school breakfast and lunch programs. It is estimated that 32 million children eat school lunches and 12 million eat school breakfasts each day (USDA, 2013). The Hunger-Free Kids Act is of specific significance to the health of children. Beyond providing funding to school lunch programs, it allows the USDA the authority to set new improved standards for foods sold in schools including lunches and vending machines, provides resources for schools and communities to use local farms and gardens to provide fresh produce, sets minimal standards for school wellness policies, increases the number of eligible children for school meal programs, increases access to drinking water in schools, and provides the USDA with the authority to provide more after-school programs in some areas (Chriqui et al., 2013; USDA, 2013).

The School Breakfast Program began as a pilot project in 1966 but became a permanent fixture in U.S. schools in 1975 (USDA, 2013). Public or nonprofit private schools up to 12th grade and public or non-profit private residential child care institutions are eligible to participate and receive subsidies from the USDA for each meal served through the program as long as the meals served meet federal requirements and that these meals are offered for free or for a reduced price to eligible children in the school district (USDA, 2013).

Requirements established for the school breakfast program follow nutrition standards set forth by the Dietary Guidelines for Americans. The three major
recommendations by the 2010 Dietary Guidelines for Americans are to balance calories with physical activity to manage weight, consume fruits, whole grains fat-free and low-fat dairy products and seafood, and to consume fewer foods containing sodium, trans-fats, saturated fats, cholesterol, added sugars, and refined grains (USDA, 2010). Further, the Dietary Guidelines for Americans provides 23 key general recommendations and 6 additional recommendations for specific populations including pregnant women, women who are breastfeeding, and individuals over 50 (USDA, 2010). The school breakfast program is available to any child enrolled in school to purchase. Children from families with income levels below 130% of the Federal poverty level are eligible for free meals. Children from family income levels between 130% and 185% of the Federal poverty level are eligible for reduced-price meals for which children cannot be charged any more than 30 cents per meal. For the period between July 1, 2013, and June 30, 2014, 130% of the poverty level was considered $30,615 for a family of four; 185% was $43,568 (USDA, 2013). According to the USDA (2013), in the year 2012, over 12.9 million children participated in the school breakfast program, with over 10.1 of those children receiving their meals for free or at a reduced rate.

Similar to the School Breakfast Program is the National School Lunch Program (NSLP). The NSLP provides daily school lunches to children enrolled in school. It follows the same guidelines as the School Breakfast Program, including eligibility and nutrition standards. According to the USDA (2013), in 2012, 31 million children were provided free or reduced cost lunches through the program each day.
Other School Based Nutrition Programs

An important aspect of the school nutrition issue is that school breakfasts and school lunches are not the only opportunities for nutrition in schools. A la carte lines, vending machines, school fundraisers, classroom celebrations, school stores and other school events also provide opportunities to improve the nutrition intake of children (CDC, 2012b). These are referred to as competitive foods and beverages and include any food sold or available in schools outside of the federally reimbursable school meals program (CDC, 2012b). Recent regulations for competitive foods set limits on the time and location in which these foods can be available for purchase; however it is only since the Hunger-Free Kids Act of 2010 that the USDA has the authority to develop federal nutrition guidelines for these foods (CDC, 2012b).

Research regarding overweight and obesity in the U.S. is not solely a government concern. The Institute of Medicine is an example of an independent, nonprofit organization that works outside the government to provide answers to pressing questions about health and health care (IOM, 2013b). It was established in 1970 as part of the National Academy of Sciences, which was chartered under President Abraham Lincoln in 1863.

In 2007, The Institute of Medicine proposed recommendations regarding standards for competitive foods and beverages in schools. These recommendations are not mandatory, but serve as preferred guidelines for the availability, sale, and content of competitive foods and beverages in schools. These recommendations include:
• Snacks, foods, and beverages should meet dietary fat criteria of no more than 35% of total calories from fat, and less than 10% of total calories from saturated fat and trans fat.
• Snacks, foods, and beverages should provide no more than 35 percent of calories from total sugars per serving with the exception of 100% fruit juices, 100% vegetable and vegetable juices and unflavored nonfat or low fat milk and yogurt.
• Snack items should be 200 calories or less per portion.
• Snacks should meet a sodium content limit of 200mg or less per potion or 480mg or less per entrée portion.
• Beverages containing nonnutritive sweeteners should only be allowed in high schools after the end of the school day.
• Foods and beverages should be caffeine-free, with the exception of trace amounts of naturally occurring caffeine-related substances.
• Water should be available throughout the school day at no cost to students.
• Sports drinks should not be available in the school setting except when provided by the school for student athletes participating in sports programs involving vigorous activity of more than 1 hour in duration.
• Food and beverages should not be used as rewards or discipline for academic performance or behavior (IOM, 2007).
Dietary Behavior and Academic Achievement

Similar to the research establishing a link between physical activity and academic achievement, there is a robust body of literature examining dietary behavior and academic achievement. Bradley and Greene (2013) conducted a meta-analysis on health behaviors and achievement. In their review, nine studies analyzed dietary behavior and academic achievement. All nine studies in the review reported an inverse relationship between inadequate nutrition and academic achievement. In specific, four longitudinal studies analyzed school breakfast and school lunch program participation and the relationship with academic achievement. All four studies determined that participation in these school-based nutrition programs was associated with lower grades, lower standardized test scores, or increased likelihood of grade level retention.

The GENYOUth foundation, supported by the National Dairy Council, the American College of Sports Medicine, and the American School Health Association, published a report titled “The Wellness Impact: Enhancing Academic Success Through Healthy School Environments” in 2013 addressing the role of schools in improving the future of the country through improving the school environment. This report describes the role of proper nutrition and physical activity in improving students’ readiness to learn. According to Diamond (2007), the mind-body connection is an important concept, in that what we think affects our health and our health affects how we think. In order for the brain to develop properly it is important to receive a well-balanced diet, plentiful in all macronutrients (fats, carbohydrates, proteins, and water) and micronutrients (vitamins and minerals). This is especially important in children because of the high rate of brain
development occurring in this life-stage (Bryan et al., 2004). Physical activity also has been shown to improve brain functioning. Brain structure and function has been found to be associated with physical activity. In specific, certain areas of the brain thought to be responsible for cognitive functions such as memory, inhibition control, and ability to block out selective information has been shown to be larger in aerobically-fit children when compared to less-fit children (Chaddock, Kramer, Hillman, & Pontifex, 2011; Chaddock et al., 2010).

In 1946 the National School Lunch Program was established in response to military leaders’ reports to Congress (U.S. Congress, 1945) stating that at least 40% of rejected recruits for World War II were rejected due to reasons related to poor nutrition (Mission: Readiness, 2012). Almost 70 years later, a debate still exists about what food should be provided and available in schools. Further, what should the role of schools be in child nutrition?

Although debate still exists, in the past decade progress has been made bringing positive changes to the school environment (GENYOUth, 2013). Progress can be attributed to increasing literature linking proper nutrition and physical activity with learning and poor nutrition to absenteeism, hunger symptoms and psychosocial problems (GENYOUth, 2013). According to the GENYOUth report, providing breakfast is the most feasible, cost-effective and helpful step schools can take to improve student overall wellness. Breakfast can be provided in a number of different ways to make it work to each school, including alternative options such as breakfast in the classroom or grab n’ go breakfasts (GENYOUth, 2013). According to existing literature, there is a strong link
between breakfast and academic performance, attendance, attention rates, and cognitive development in children and adolescents (Abalkhail & Shawky, 2002; Edward & Evers, 2001; Kleinman, Hall, & Green, 2002; Taras, 2005). Students with low nutrition risk based on participation in school child nutrition programs tend to report better attendance and grades in math (Kleinman et al., 2002). In schools where a breakfast program exists, students tend to have lower rates of lateness (Taras, 2005) and are absent less (Edward & Evers, 2001). Further, skipping breakfast has been linked to decreased cognitive abilities and poor academic performance (Abalkhail & Shawky, 2002).

A study by Park, Sherry, Foti, and Blanck (2012) investigated the relationship between academic grades and sugar-sweetened soda intake among U.S. adolescents. The study found a significant association between sugar-sweetened soda intake at least one time per day and earning mostly B, C, and D/F grades. Tobin (2013) took a different approach and examined the relationship between fast-food consumption and English and Math test scores for fifth graders. The study reported that test scores decreased as reported fast-food consumption increased.

While debate may exist on the role of school regarding diet, it is accepted that the diet of most U.S. adolescents fails to meet the most basic guidelines and recommendations for healthy eating (Popkin, Siega-Riz, Haines, & Jahns, 2001). 

Further, although the 2012 School Health Policies and Practices Study (SHPPS) showed that schools have made significant progress in creating a supportive school nutrition environment since the previous study in 2006, there is still room for improvement. As of the 2012 SHPPS report, only 14.8% of school districts required and
26.5% recommended that schools offer a self-serve salad bar and only 38.8% of districts required and 27.6% recommended that schools prohibit advertisements for junk foods or fast-food restaurants on school property (CDC, 2013b). It is also generally accepted that eating patterns established early in a child’s life can have lifelong effects on dietary behaviors and preferences (Campbell, Symons, & Demark, 1998).

**Social Support**

Social support is an integral part and function of something even more complex: social networks. Social networks are the relationships that surround individuals and the links between people that may or may not provide support. Social networks provide specific functions, such as social influence, social control, social undermining, social comparison, companionship, and social support (Glanz, 2008). According to Burg and Seeman (1994), social support is different from other functions of social networks and relationships in that it is always intended by the provider to be helpful, whether it is perceived that way or not by the receiver.

According to Lakey and Cohen (2000), social support can be identified in two dimensions: received social support and perceived social support. Lakey and Cohen suggested that received social support includes advice and reassurance and frequency of supportive actions from others. Perceived social support is more focused on the individual and is defined by Lakey and Cohen as perceptions of how much support one has available to them (2000). Mackinnon (2012) added to this definition, suggesting that perceived social support is associated with one’s ability to cope with negative events.
A substantial body of literature links social support, defined as an individual’s perception that he or she is cared for, esteemed, and valued by people in his or her social network, that enhances personal functioning, assists in coping with stressors, and may buffer him or her from adverse outcomes (Malecki & Demaray, 2002), and adolescent adjustment. For example, social support has been linked to academic self-concepts (Wenz-Gross, Siperstein, Untch, & Widaman, 1997), adolescent adjustments and behavioral problems (Dunn, Putallaz, Sheppard, & Lindstrom, 1987), and depression (Cheng, 1997).

**Social Support and Family and Friends**

The research regarding social support as it relates to student health, physical activity, and academic achievement is not as developed as the research regarding overweight and obesity and physical activity and nutrition. Specifically, few studies investigate middle school students and social support. In the existing literature, there is conflicting evidence regarding the association of social support and physical activity (Prochaska, Rodgers, & Sallis, 2002). According to Duncan, Duncan, and Strycker (2005), social support is a major influence in physical activity for middle school students. Prochaska et al. (2002) concluded that two sources of social support for children and adolescents come from parents and peers. Additional support originates from siblings (Duncan et al., 2005), teachers and coaches (Humbert et al., 2006). According to Prochaska et al. (2002), there is inconsistency in the findings regarding social support and physical activity due to different measure social support and of physical activity. Social support for physical activity can take many forms, including transportation,
payment of feels, emotional and motivational encouragement, and praise, as well as modeling (Prochaska et al., 2002).

Some studies find that social support is positively correlated to academic achievement (Mackinnon, 2012; Robbins et al., 2004). According to Mackinnon (2012), this link is specifically important when students are making transitions, such as moving into post-secondary education. According to the author, this transition time is a time of great stress. Mackinnon (2012) concluded that high perceived social support improves academic achievement by reducing the stress students experience in this transition. The author, however, concluded also that social support may not have an effect on future academic performance as it is sometimes assumed (Mackinnon, 2012).

Beyond different measures of social support, gender and age are also a factor. Robbins, Stommel, and Hamel (2008) investigated gender and age differences in social support and their relationship with physical activity among middle school students. The authors found that students identified parents, coaches/gym teachers, and peers as the most important support persons in regards to physical activity. Interestingly, father support was specifically identified as a significant source of support. McGuire, Hannan, Neumark-Sztainer, Cossrow, and Story (2002) also found a significant relationship between parents’ and adolescents’ physical activity attitudes and behaviors among an ethnically diverse group of adolescents. Specifically, McGuire et al. found that the parental-adolescent support for physical activity relationships were stronger for boys than girls. In contrast with McGuire et al., Davison, Cutting, and Birch (2003) found that girls were more likely to participate in physical activity when at least one of the parents offers
support, either by providing logistical support including driving to an activity or by setting an example. Further, when age is taken in consideration, Robbins et al. (2008) found that older middle school girls identified peers and gym teachers or coaches rather than family as a more important source of social support for exercise. This finding supports Duncan et al.’s (2005) finding that as students age, there is a decrease in perception of parent and sibling support and that in general those middle school student who perceive their support from peers tend to have higher levels of physical activity.

During childhood and adolescence, peer influences are very important and can have a significant impact on attitudes towards health behaviors including exercise (Stankov, Olds, & Cargo, 2012). According to Hohepa, Scragg, Schofield, Kolt, and Schaaf (2007), friend support was significantly associated with lunchtime physical activity for both junior and senior students. Parental support and school support were only significantly associated with lunch time physical activity for junior students. According to Hohepa et al., social support from all sources, including parents, peers, schools, with the exception of school support and senior students, were associated with participation in after-school physical activity.

Social support can also be associated with dietary health behaviors including fruit and vegetable consumption (Kubik, Lytle, & Fulkerson, 2005) and adherence to changes in diets (Wilson & Ampey-Thornhill, 2001). Less is known regarding healthy eating is different for adolescents depending on food item, availability and access at home, with friends or at school. Further little is known whether adolescents perceive dietary
behaviors as influenced or supported by adults in their lives including parents (Stanton, Green, & Fries, 2007).

The concept of social support as it relates to dietary intake is not without controversy. Whereas Shaikh, Yaroch, Nebeling, Yeh, and Resnicow (2008) described social support as a key influence on dietary intake, Williams and Mummery (2012) investigated family support as it relates to nutrition behaviors in adolescents and found that “parental values” which they defined as perceived importance of healthy eating and physical activity by parents and use of family rule around food and watching television was not associated with healthy eating behaviors.

**Social Support and Schools**

Studies by Wentzel (1998) and Goodenow (1993) are part of a body of literature that shows that early adolescents who perceive their parents, peers, and teachers to be supportive perform better academically. Siddall, Huebner, and Jiang (2013) examined the relationship between three sources of what the authors defined as school-related support global life satisfaction in middle school students in the U.S. They identified these three sources of school-related support as parent involvement, peer support for learning, and teacher-student relationships. Although this study was not specific to physical activity or dietary behavior specifically, the results suggested that school-related experiences, most specifically family-school interactions, have an impact on students’ overall perceptions and evaluations of their lives (Siddall et al., 2013). Schools are not only a source of food and beverages for students during the school day, but also they can
indirectly influence social and cultural norms about food, and specifically “healthy” food in the school environment (McNaughton, 2012).

In summary, reports by governmental and non-governmental organizations have come to similar conclusions, supporting the importance of physical activity and healthy nutrition for school aged children. Further, there is also a consensus on the link between overall health, physical activity, and nutrition on academic achievement. The role of social support on these variables is still a growing literature and one that still needs to be explored. In specific, the literature in this area is lacking among the middle school population.
CHAPTER III
RESEARCH METHODS AND PROCEDURES

The Purpose of the Study

The purpose of this study was to analyze the impact of social support and selected demographics on physical activity, dietary behavior, and academic achievement among middle and high school students.

Research Questions

1. Is there a relationship between Dietary Social Support and Dietary Behavior when Physical Activity is considered?
   a. If yes, will this relationship be influenced by age and sex?

2. Is there a relationship between Dietary family, friends, and/or school social support and dietary behavior?
   a. If yes, will this relationship be influenced by age and sex?

3. Is there a relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered?
   a. If yes, will this relationship be influenced by age and sex?

4. Is there a relationship between physical activity family, friends, and/or school social support and physical activity?
   a. If yes, will this relationship be influenced by age and sex?

5. Is there a relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered?
a. If yes, will this relationship be influenced by age and sex?

b. If yes, are both social support variables (Physical activity and/or Dietary behavior) significant?

**Hypotheses**

Based on the research questions, this study investigated the impact of physical activity, dietary behaviors, social support and selected demographics on student academic achievement. The following null hypothesis was tested:

1. There is no statistically significant relationship between dietary social support and dietary behavior when physical activity is considered.
   a. The statistical significance of this relationship was not influenced by age and sex.

2. There is no statistically significant relationship between family, friends, and/or school social support and dietary behavior
   a. The statistical significance of this relationship was not influenced by age and sex.

3. There is no statistically significant relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered.
   a. The statistical significance of this relationship was not influenced by age and sex.

4. There is no statistically significant relationship between family, friends, and/or school social support and physical activity.
a. The statistical significance of this relationship was not influenced by age and sex.

5. There is no statistically significant relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered.

   a. The statistical significance of this relationship was not influenced by age and sex.

   b. Neither social support variable was significant in predicting academic achievement.

**Study Design**

This study was a cross-sectional web-based online survey of the study population of middle and high students. The study was conducted during spring of the 2013-2014 academic school year. A modified instrument in measuring social support and physical and dieting behaviors plus self-developed questions was used for data collection. The survey instrument and data collection method was pilot-tested.

**Population of the Study**

Middle and high school students served as the study population. In the research study school where data was collected, middle school students consisted of those students in 7th and 8th grades, ranging in age from 12 to 14 years of age. High school students consisted of students in 9th, 10th, 11th, and 12th grades. High school students ranged in age from 14 to 18 years. A substantial body of literature exists investigating the relationships between physical activity, dietary behavior, academic achievement, and
social support. Studies examined these variables in several combinations. Importantly, however, most of the studies conducted to date have examined these relationships in regards to high school and college students, and the adult population. In this context, little is known regarding middle school students. This study contributed to this growing body of literature by incorporating the middle school population. Further, this study examined age as a factor for this specific school district by also including the high school population.

The study was geographically bound to the state of Ohio. In the state of Ohio, the school systems of grade levels and middle and high school differentiation and requirements for graduation are consistent within the state, and therefore the selected school system was a representation of that system. The intended school district, which served as a sample frame for this study, was classified by the Ohio Department of Education as typology 6.

Typology 6 describes a suburban school, with very low student poverty and large student population size. In 2013, this school district had an enrollment of 1,936 students, with an average income of $59,622, 3% student poverty and 2% students identified as belonging to a minority group. In the state of Ohio, 46 school districts are included in the typology 6-category community (Study School District, n.d.; throughout this study, the pseudonym “Study School District” is used in place of identifying the actual district by name.). The school district used in this study was selected due to a unique commitment by the school administrators and the district in general to support a healthy environment for students, teachers, staff, parents, and the community. The district provides numerous
opportunities for students to participate in physical activity before, during, and after school. Further, the district strives to provide healthy meals to students and staff in both the school cafeterias and a la carte lines and vending machines (Study School District, n.d.). Its student composition, including gender and grade level, is similar to that of the state of Ohio.

The selection of one school district to represent the students in the whole state qualifies the method of sampling for this study as a convenience sample. Using this sampling method was largely due to the exploratory nature of this study and resource availability, especially considering the requirement of parental approval and school policy in conducting student subject surveys. The limitation of such sampling strategy for this study is discussed later.

There were four school buildings in this particular school district, with the middle and high school sharing a campus. All middle and high school students in this school district population were invited to participate in the study. Therefore, at grade level, this is a systematic sample. There were approximately 342 middle and 626 high school students in these schools. According to the pilot study result, the response rate of parental approval form could be between 53% and 84%, and approval rates could be between 72% and 84%. Thus approximately 513-813 parental approval of participation were expected if the rates remain in the pilot study ranges. In the pilot study, all students who were granted parental permission participated in the study. However this 100% participation rate could be partially due to the fact that students took the survey during school hours. Due to the much larger subject pool and scale for the study, conducting the
study during school hours is not feasible due to infringement into the daily function of the school. If the participation rate for the final data collection is estimated between 80% to 100% approximately 650 to 813 subjects were expected to complete the instrument.

**Instrumentation**

An electronic version of the instrument as found in Appendix B was used to collect data regarding physical activity, dietary behavior, social support, and academic achievement from middle and high school students. The researcher created this questionnaire by combining questions from several existing questionnaires.

The final instrument used for data collection in this study consisted of nine sections of questions: physical activity, dietary behavior, social support from family on physical activity, social support from friends on physical activity, social support from family on dietary behavior, social support from friends on dietary behavior, social support from school on physical activity, social support from school on dietary behavior, academic achievement, and selected demographics. Table 3 shows the instrument section and source of original questions. Each section is described in detail below.
### Table 3

**Instrument Original Sources**

<table>
<thead>
<tr>
<th>Question section</th>
<th>Number of Question Items</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity</td>
<td>5</td>
<td>CDC’s 2013 National Middle School Youth Risk Behavior Surveillance Survey</td>
</tr>
<tr>
<td>Dietary Behavior</td>
<td>9</td>
<td>CDC’s 2013 National High School Youth Risk Behavior Surveillance Survey</td>
</tr>
<tr>
<td>Family Physical Activity Social Support</td>
<td>13</td>
<td>Dr. James Sallis Sallis, Grossman, Pinski, Patterson, and Nader (1987)</td>
</tr>
<tr>
<td>Friend Physical Activity Social Support</td>
<td>13</td>
<td>Dr. James Sallis Sallis, Grossman, Pinski, Patterson, and Nader (1987)</td>
</tr>
<tr>
<td>Family Dietary Social Support</td>
<td>10</td>
<td>Dr. James Sallis Sallis, Grossman, Pinski, Patterson, and Nader (1987)</td>
</tr>
<tr>
<td>Friend Dietary Social Support</td>
<td>10</td>
<td>Dr. James Sallis Sallis, Grossman, Pinski, Patterson, and Nader (1987)</td>
</tr>
<tr>
<td>School Physical Activity Social Support</td>
<td>1</td>
<td>Youth’12</td>
</tr>
<tr>
<td>School Dietary Social Support</td>
<td>1</td>
<td>Youth’12</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>1</td>
<td>CDC’s 2009 National High School Youth Risk Behavior Surveillance Survey</td>
</tr>
<tr>
<td>Demographic questions</td>
<td>3</td>
<td>CDC’s 2013 National High School Youth Risk Behavior Surveillance Survey</td>
</tr>
</tbody>
</table>
Physical Activity

Physical activity was measured using existing questions from the 2013 Middle School Youth Risk Behavior Surveillance Survey (YRBSS) physical activity section. The 5 questions in the 2013 Middle School YRBSS asked the following:

- “During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)”
- “On an average school day, how many hours do you watch TV?”
- “On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Count time spent on things such as Xbox, PlayStation, an iPod, an iPad or other tablet, a smartphone, YouTube, Facebook or other social networking tools, and the Internet.)”
- “In an average week when you are in school, on how many days do you go to physical education (PE) classes?”
- “During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)”

These questions were asked in the form of multiple-choice questions. In the analysis of the data, a total score was calculated from the responses, creating a new variable that represented overall physical activity level per subject.
**Dietary Behavior**

Dietary behavior was measured using existing questions from the 2013 National High School Youth Risk Behavior Surveillance Survey dietary behavior section. The nine questions asked students to recall meals and snack consumed in the span of the day, at home, at school, restaurants, and anywhere else. The questions were:

- “During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)” “During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)”
- “During the past 7 days, how many times did you eat green salad?”
- “During the past 7 days, how many times did you eat potatoes? (Do not count French fries, fried potatoes, or potato chips.)”
- “During the past 7 days, how many times did you eat carrots?”
- “During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)”
- “During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)”
- “During the past 7 days, how many glasses of milk did you drink? (Count the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)”
- “During the past 7 days, on how many days did you eat breakfast?”
Social Support

In this study, family, friends, and the school social support were measured separately for the support in physical activity and for the support in diet. Therefore, the instrument measured a total of six social support subscales: support from family for physical activity and diet, support from friends for physical activity and diet, and school support for physical activity and diet.

Questions used for social support physical activity and social support eating behaviors from family and friends were adopted from two existing social support scales developed by Sallis et al. (1987). Permission to use these scales was secured from the developers (see Appendix C).

For each of the family and friends support in eating behavior students were asked to rate in a Likert scale where 1 = none, 2 = rarely, 3 = a few times, 4 = often, 5 = very often, and 8 = does not apply to what extent they perceived support from that source. Students were asked to rate the extent to which in the past three months their family and friends encouraged them not to eat “unhealthy foods” (cake, salted chips) when they were tempted to do so; discussed eating habit changes with them; reminded them not to eat high fat, high salt foods; complimented them on changing eating habits; commented if they went back to old eating habits; ate high fat or high salt foods in front of them; refused to eat the same foods they ate; got angry when they encouraged them to eat low salt, low fat foods; and offered them foods they were trying not to eat.

The social support physical activity scale asked students to rate in a Likert scale where 1 = none, 2 = rarely, 3 = a few times, 4 = often, 5 = very often, and 8 = does not
apply to what extent their family and friends support their physical activity efforts during the past months. Students were asked to rate statements such as: during the past three months, my family exercised with me, offered to exercise with me, gave me helpful reminders to exercise, gave me encouragement to stick with exercise, changed their schedule so we could exercise together, discussed exercise with me, complained about the time I spend exercising, criticized me or made fun of me for exercising, gave me rewards for exercising, planned for exercise on recreational outings, helped plan activities around my exercise, asked me for ideas on how they can get more exercise, and talked about how much they like to exercise.

Two questions in this study were used to assess student perceived social support from their school. The questions were as follows:

- “How much does your school encourage you to eat healthy food?”
- “How much does your school encourage you to be physically activity”

Both questions were rated in a continuous scale, giving students the option to rate the questions from 1 (Not at all), 2 (a little), 3 (some), and 4 (very much). These questions were used from the New Zealand National Youth’12 survey. The Youth’12 survey is part of the Youth 2000 survey series carried out by the AHRG (2012).

The AHRG is a multidisciplinary team of researchers focused on promoting the health of New Zealand Youth. Youth’12 is the third national health and wellbeing survey of secondary students in New Zealand (AHRG, 2012). Permission to use the two questions in this study was provided by Dr. Sarah Masson, one of the researchers for the group, via email (see Appendix C).
**Academic Achievement**

For the purposes of this study, academic achievement was measured using an existing question from the CDC’s 2009 National High School Youth Risk Behavior Surveillance Survey. The question asked subjects to describe their grades in the past 12 months as “Mostly A’s, Mostly B’s, Mostly C’s, Mostly D’s, Mostly F’s, none of these grades, or not sure.”

**Demographics**

Three demographic related questions were asked in the instrument. The demographic questions included “how old are you?” “What is your sex?” and “Are you a middle or high school student?” The variable, “Are you a middle or high school student?” was added after the pilot study. Both the pilot study and the research study schools lack variability in race, ethnicity, and socioeconomic status; therefore these variables were not included in the instrument.

**The Pilot Study**

In order to get an initial sense of how well the newly compiled instrument would work in measuring what it intended to measure and its reliability, as well to test the intended data collection process, especially when active parental approval was required, a pilot study was conducted in September 2013. Kent State University Institutional Review Board (IRB) approval was acquired on August 19, 2013. See Appendix D for pilot study IRB application and Appendix E for pilot study IRB approval.

The school district participating in the pilot study comprised of 2 elementary school, 1 middle school, and 1 high school building. The study was piloted in the middle
and high school buildings, including 6, 7, 8, 9, 10, 11, and 12 grades. During the 2012-2013 school year enrollment consisted of 397 students in the middle school and 567 students in the high school. The pilot study school is classified as typology 4. Typology 4 is used to describe school classified as small towns with high student poverty and average student population size. In 2013, the pilot school district enrollment was 1,916 students with a median income of $28,710, 64% student poverty and 8% students belonging to a minority group. In 2013, a total of 89 districts within the state of Ohio were classified as Typology four (Ohio Department of Education [ODE], 2013)

**Sampling**

The school district participating in the pilot study was selected as a convenience sample due to willingness to participate in the study. The district’s superintendent was approached, and in turn he contacted the middle and high school principals who agreed to participate. Parental consent forms were distributed by the teacher to all students currently participating in health and physical education classes in both the middle and high school.

In the middle school, 88 parental consent forms were distributed. Of the 88 consent forms distributed, 47 (53.4%) forms were returned. Of the 47 parental consent forms returned, 34 (72.3%) parents allowed students to participate in the study. Of the 34 students with clearance to participate, all 34 (100%) took the survey.

In the high school, 132 parental consent forms were distributed. Of those, 112 (84.8%) were returned. Of the 112 forms returned, 94 (83.9%) parents granted students
permission to participate in the study. Of the 94 students with permission to participate, all 94 (100%) students completed the instrument.

**Pilot Study Procedures**

**Web Survey Setup—Qualtrics Software.** Qualtrics was the online software used to create and distribute the instrument. Qualtrics is software provided by Kent State University to its faculty and students to conduct online surveys. The Qualtrics software allows researchers to build, distribute, and analyze online surveys. Instrument building is made easily accessible to researchers through the use of on-screen prompts. The instrument was built using drop down menus used to select the type of questions required, including multiple choice, or Likert scale questions. Once collected, the data was easily downloaded into SPSS format for the data analysis by clicking on a download button embedded in Qualtrics website.

**Data collection on school site.** A meeting with the district superintendent and building principals for both the middle and high school was held to discuss the process. Parental informed consent forms were given to the respective building principals. The principals in turn handed the informed consent to the physical activity and health teachers at each school. Teachers distributed the parental informed consent forms to students and requested that the forms be return with parental approval or disapproval by the end of the same week (4 days later). The collection of the forms was done in the reverse order. Students returned the forms to the teachers, and the teacher in turn returned them to the principal and then the investigator. The principals retained a list of names including those students whose parents did not give permission to participate in the study.
On the designated day, one week after the parental consent collection, students went to the school’s media room to take the survey. Those students who did not have permission to participate accompanied the others, but were asked to do other work during the time needed for students to complete the online survey. The online survey was distributed via survey link. The link was provided to the principals by the investigator. The principals, with the help of the teachers, uploaded the link to the computers for students. According to the data collected, approximately 20 minutes was required to complete the survey. Once students completed the survey, they returned to class as normal. The online survey software automatically saved the responses. Once the data collection was completed online data were downloaded by the investigator directly from the Qualtrics website through the Kent State University website.

Pilot Study Findings

Response rates. In the middle school, 88 parental consent forms were distributed. Of the 88 consent forms distributed, 47 (53.4%) forms were returned. Of the 47 parental consent forms returned, 34 (72.3%) parents allowed students to participate in the study. Of the 34 students with clearance to participate, all 34 (100%) took the survey.

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Data collection process. On the designated day, those students with parental permission to participate in the study were taken to the school’s media room during the
health or physical education classes. The link for the survey was uploaded to the school computers by each respective school principal (middle and high school). Students then took turns taking the survey. Those students who did not have permission to participate remained in the classroom with the teacher, while the principal proctored the survey administration.

The major challenge to collecting the data in this manner was the time away from the classroom and the planned curriculum and the invested time by the building principals in proctoring the survey. Further, if a student was not in class on the designated day, arrangements were made for the student to take the survey at a later time during the week of data collection.

Participants’ demographic information. A total of 125 students participated in the survey. Of the 125 total students, 111 (88.8%) were identified as high school students and 14 (11.2%) were identified as middle schools students. Descriptive statistics of the sample revealed that students ranged in age starting at 11 years old to 18 years old or older. Of the total sample, 43 (34.4%) identified themselves as male and 76 (60.8%) identified themselves as females.

Validity and reliability. The pilot study data were analyzed using several methods using SPSS software. Frequency tables were created and visually inspected by the researcher revealing some missing data but an overall well distributed response to the questions.

The instrument consisted of portions of previously validated instruments. In order to determine the extent to which this newly created instrument provided consistent
results, a test of internal consistency (Cronbach’s alpha) was conducted for the overall instrument and for the individual subscales. Overall Cronbach’s alpha for all respondents was found to be 0.938. During the data analysis process it was found that a number of cases had chosen the Does Not Apply option to a various number of social support questions, up to 100% of the questions. In such a case, a tentative rule was used to deal with the Does Not Apply case; that is, one is only allowed to have answered Does Not Apply to a maximum of 50% of the questions. Otherwise the case would not be included in further analysis. Once this rule was applied, Cronbach’s alpha for all social support questions was decreased to 0.813. Table 4 has listed all Cronbach’s alpha for subscales with and without the rule.

Table 4

Pilot Study Instrument Validity

<table>
<thead>
<tr>
<th></th>
<th>Cronbach’s Alpha for all respondents</th>
<th>Cronbach’s Alpha with the rule in place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>.938</td>
<td>.813</td>
</tr>
<tr>
<td>Family support for eating</td>
<td>.867</td>
<td>.464</td>
</tr>
<tr>
<td>Friend support for eating</td>
<td>.921</td>
<td>.417</td>
</tr>
<tr>
<td>Family support for exercise</td>
<td>.898</td>
<td>.781</td>
</tr>
<tr>
<td>Friend support for exercise</td>
<td>.912</td>
<td>.865</td>
</tr>
</tbody>
</table>

Even though the reliability of the two subscales in social support for diet was low with the rule implemented, the overall scale has a high reliability coefficient. It generally
supports the use of the tested instrument to measure the variables in the study. There is no apparent reason to change the instrument for formal data collection use. But the Does Not Apply phenomena need the attention in data analysis phase to only include valid cases in study. Further, the pilot study validated the process to acquire consent from both parents and students.

**Data Collection**

As informed by the pilot study experience, an online instrument created in Qualtrics for pilot study was re-created under a new name and web address. All questions in the instrument were used directly from the original instruments; therefore no modifications were made to the questions structures. Dillman’s (2000) recommendations were used in determining survey design, specifically regarding the ordering of questions.

Dillman (2000) recommended personal data (demographics) be placed at the end of the questionnaire. Further, as recommended by Dillman, specific introductions and direction were provided for each question topic. Data collection process followed the steps as below.

**Obtaining Approval**

Following IRB modification request submission (see Appendix F) and subsequent IRB approval (see Appendix G), parental informed consent forms were distributed by the first period class teacher to all middle and high school students in the school district.

Students were asked to gather parental permission and return the informed consent forms to the same teacher. An announcement was sent to parents (via school parental portal) as a reminder to return the informed consent forms within one week. The
teacher collected the forms from the subjects and placed them in a packet. The packet was then submitted to the building’s administrative office, where the investigator collected them and stored them in a locked cabinet at his Kent State University office. Those students who were granted parental permission to participate were sent a link to the survey via a school managed closed emailed system. The first page of the survey contained the assent form (for those 12 years and below) or an informed consent (for those 13 years or older). Only once the student clicked on “agree” to participate were they given access to the instrument (Appendix F).

Invitation and Request for Participation

Once the deadline was reached, those subjects who were granted permission to participate were sent an email via the school closed email system with a link to the instrument through the student’s school email account.

Two links were provided in the email sent to subjects. The first link was used by those subjects 12 years and younger. The second link was used by those subjects 13 years and older. These instruments were identical, except for the welcome page, which provided those 12 and younger with an assent form to participate in the study, and an informed consent to those 13 and older (see Appendix F).

Follow Up

The parent consent forms were distributed with a two week deadline for return to the school. An announcement was posted on the school’s parent portal website reminding parents to return the completed consent forms to the school by the set deadline date. At the end of the school day on January 24th, the researcher collected parent
consent forms from the building principals’ offices. The researcher then compiled two lists. One list consisted of those subjects who had been granted permission to participate in the study. A second list consisted of those subjects who had not been granted permission to participate in study. On January 24th, the investigator collected consent forms from the principals’ offices. Due to a weak response, the deadline was extended until January 31st. During the week of January 31st, three snow days closed the school buildings. At the request of the high school principal, the deadline for consent collection was further extended until February 6th, 2014. Once parental consents were secured, a final list comprising of those students who were granted permission to participate in the study was compiled. This list was used as a roster for email distribution.

Once sufficient a number of middle school subjects had been granted permission to participate, the instrument link was sent to all middle school students with parental permission to participate on January 31st, 2014. Following the extensions, the link to the survey was distributed via a school-managed closed system email on February 10th, 2014 to all middle and high school subjects who had been granted parental permission to participate. The instrument-closing deadline was set for February 21st, 2014. On February 17th and 18th, the school buildings were closed in acknowledgment of Presidents’ Day and a snow day respectively. On February 21st, the number of responses received was still too low for use in a statistical analysis. A one week extension was granted with a final deadline of February 28th, 2014.
Data Analysis

According to the research questions and hypotheses, there were a total of 15 variables tested and analyzed. The variables and their corresponding instrument items are presented in Table 5.

Table 5

*Instrument Item Numbers*

<table>
<thead>
<tr>
<th>Variables in the order of their appearance in research question statements</th>
<th>Question Items</th>
<th>Data Management Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dietary Social Support</td>
<td>#16 (1-10)</td>
<td>Compute for a composite score from all dietary support variables</td>
</tr>
<tr>
<td>2. Dietary Behavior</td>
<td>#6-#14</td>
<td>Compute for a composite score</td>
</tr>
<tr>
<td>3. Physical Activity</td>
<td>#1-#5</td>
<td>Compute for a composite score</td>
</tr>
<tr>
<td>4. Age</td>
<td>#20</td>
<td></td>
</tr>
<tr>
<td>5. Sex</td>
<td>#22</td>
<td></td>
</tr>
<tr>
<td>6. Student Status</td>
<td>#21</td>
<td></td>
</tr>
<tr>
<td>7. Dietary Family Social Support</td>
<td>#16 (1-10)</td>
<td>Compute a composite score</td>
</tr>
<tr>
<td>8. Dietary Friend Social Support</td>
<td>16 (11-20)</td>
<td>Compute a composite score</td>
</tr>
<tr>
<td>9. Dietary School Social Support</td>
<td>18</td>
<td>Compute a composite score</td>
</tr>
<tr>
<td>10. Physical Activity Social Support</td>
<td>15 (1-13)</td>
<td>Compute a composite score</td>
</tr>
<tr>
<td>11. Physical Activity Family Social Support</td>
<td>16 (1-13)</td>
<td>Compute a composite score</td>
</tr>
<tr>
<td>12. Physical Activity Friend Social Support</td>
<td>16 (14-26)</td>
<td>Compute a composite score</td>
</tr>
<tr>
<td>13. Physical Activity School Social Support</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>14. Academic Achievement</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>
Data analysis began by managing the data set for the following purposes:

1. Screening all responses for usable cases. As the pilot study had suggested, there were some students who did not answer any questions about social support. Therefore, that was considered as usable in data analysis. A similar scenario was that some students selected *Does Not Apply* to all social support questions. Such cases were deemed unusable because they did not provide any information regarding social support.

2. Secured and created all 15 research variables for statistical analysis. This has been indicated in Table 5 in the data management strategy column.

3. Examine dependent variables for normality and social support variables for correlations in order to satisfy the assumptions for the hypothesis test. This step can be viewed as a preparation for hypothesis test.

4. Once all needed variables were ready, hypotheses’ testing was conducted.

**Hypothesis Testing**

Each study hypothesis was tested using a series of multiple regression tests with the exception of research questions 5, 5a, and 5b for which a binary logistic regression test was conducted. According to Dimitrov (2009), a multiple regression involved two or more independent variables to explain or predict one dependent variable. A multiple regression test can identify if there is a statistically significant relationship between variables. Due to limited variations observed in the data collected about academic achievement, the academic achievement variable has been treated as a dichotomous variable for either an A grade or a B grade. Thus, a binary logistic regression analysis
was conducted to predict the odds of a subject to get an A versus a B grade when compared by social support, academic achievement, physical activity, and dietary behavior.

In summary, based on the findings of the pilot study it was decided to conduct the study with the existing instrument without any significant changes. The only change to the instrument was including an additional demographic question. The additional question asked students to identify themselves as either a middle school or high school student. This information allowed for a more accurate analysis of the data based on student status. All hypotheses were tested with either a multiple regression testing using $p < 0.05$ as a significance level or a binary logistic regression test using $p \leq .05$ as a significance level. An amended IRB form was submitted. IRB approval for the study was received on December 19th, 2013 (see Table 6).
### Table 6

**Hypothesis Tests**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Variables Involved</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There is no statistically significant relationship between dietary social support and dietary behavior when physical activity is considered.</td>
<td>Dietary Social Support&lt;br&gt;Dietary Behavior&lt;br&gt;Physical Activity</td>
<td>Multiple regression when Physical Activity is used as dependent variable</td>
</tr>
<tr>
<td>a. The statistical significance of this relationship will not be influenced by age, sex, and/or student status.</td>
<td>Dietary Social Support&lt;br&gt;Dietary Behavior&lt;br&gt;Physical Activity</td>
<td>Multiple regression when Physical Activity is used as dependent variable</td>
</tr>
<tr>
<td>2. There is no statistically significant relationship between Dietary family, friends, and/or school social support and dietary behavior.</td>
<td>Dietary Social Support (family &amp; friend and school)&lt;br&gt;Dietary Behavior</td>
<td>Multiple regression when Physical Activity is used as dependent variable</td>
</tr>
<tr>
<td>a. The statistical significance of this relationship will not be influenced by age, sex, and/or student status.</td>
<td>Dietary Social Support (family &amp; friend and school)&lt;br&gt;Dietary Behavior</td>
<td>Multiple regression when Physical Activity is used as dependent variable</td>
</tr>
<tr>
<td>3. There is no statistically significant relationship between physical activity, social support, and physical activity when dietary behavior is considered.</td>
<td>Physical Activity Social Support (family, friends, and school)&lt;br&gt;Physical Activity&lt;br&gt;Dietary Behavior</td>
<td>Multiple regression when Physical Activity is used as dependent variable</td>
</tr>
<tr>
<td>a. The statistical significance of this relationship will not be influenced by age, sex and/or student status.</td>
<td>Physical Activity Social Support (family, friends, and school)&lt;br&gt;Physical Activity&lt;br&gt;Dietary Behavior</td>
<td>Multiple regression when Physical Activity is used as dependent variable</td>
</tr>
<tr>
<td>4. There is no statistically significant relationship between physical activity family, friends, and/or school social support and physical activity.</td>
<td>Physical Activity Social Support (family, friends, and school)&lt;br&gt;Physical Activity</td>
<td>Multiple regression when Physical Activity is used as dependent variable</td>
</tr>
<tr>
<td>a. The statistical significance of this relationship will not be influenced by age, sex, and/or student status.</td>
<td>Physical Activity Social Support (family, friends, and school)&lt;br&gt;Physical Activity&lt;br&gt;Dietary Behavior</td>
<td>Multiple regression when Physical Activity is used as dependent variable</td>
</tr>
</tbody>
</table>

*(table continues)*
Table 6 (continued)

**Hypothesis Tests**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Variables Involved</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. There is no statistically significant relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered.</td>
<td>Physical Activity Social Support (Family, friends, and school) Diet</td>
<td>Binary Logistic Regression when Social Support is used as dependent variable</td>
</tr>
<tr>
<td></td>
<td>Behavior Social Support (family, friends, and school) Academic Achievement Physical Activity Dietary Behavior</td>
<td></td>
</tr>
<tr>
<td>a. The statistical significance of this relationship will not be influenced by age, sex and/or student status.</td>
<td>Physical Activity Social Support (Family, friends, and school) Diet</td>
<td>Binary Logistic Regression when Social Support is used as dependent variable</td>
</tr>
<tr>
<td></td>
<td>Behavior Social Support (family, friends, and school) Academic Achievement Physical Activity Dietary Behavior</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Age, Sex</td>
<td></td>
</tr>
<tr>
<td>b. Neither social support variable will be significant in predicting academic achievement.</td>
<td>Physical Activity Social Support Diet</td>
<td>Binary Logistic regression when Social Support is used as dependent variable</td>
</tr>
<tr>
<td></td>
<td>try Social Support Academic Achievement</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER IV

RESULTS

The Purpose of the Study

The purpose of this study was to analyze the impact of social support and selected demographics on physical activity, dietary behavior, and academic achievement among middle and high school students.

Data Collection and Management

On December 9, 2013, permission was sought from Kent State University Institutional Review Board (IRB) to conduct a study to analyze the impact of social support and selected demographics on physical activity, dietary behavior, and academic achievement among middle and high school students. Permission to proceed with the data collection process was granted by the IRB on December 19, 2013. In order to achieve compliance the researcher was directed to:

- Secure active parental consent from the parents/guardians of all subjects
- Secure active assent from subjects 12 years and younger
- Confirm active consent from subjects 13 years old and older

Online instrument distribution was conducted using the Kent State University supported Qualtrics software. Qualtrics is a software package provided to all Kent State University faculty and students for the purpose of online research data collection.

In the spring of 2014, 943 subjects were enrolled in the middle and high school in the Northeast Ohio school district that was the focus of this study. In compliance with
IRB protocol, all 943 students, the population for this study, received a paper parental consent form to take home to secure a parent or guardian signature indicating affirmation that their child who was an enrolled student could participate in the study. Teachers of the first period classes in both the middle and high school distributed parental consent forms. Students were directed to return signed parental consent forms to the teacher from which they received them. Following the distribution of the consent forms, a reminder email was sent to each student via their school email account. This notification reminded students to return the forms to their first period teachers by the designated date. These teachers collected all forms and delivered them in an envelope to the administration office by the identified deadline date. Of the 943 consent forms distributed, 260 forms were returned. This indicated a 27.6% parental consent form return rate. Of the returned forms, 177 were from middle school students and 83 were from high school students. Of the forms returned, 202 (77.7%) parents approved the participation in the study for their children. Among these, 136 were middle school students and 66 were students enrolled in the high school. Fifty-eight (22.3%) parents declined participation of their children in the study. Among these, 41 were parents of middle school students and 17 had sons and daughters enrolled at the high school. Table 7 shows the response rates for the parental consent.

Once parental consent was secured, a final list comprising of those students who were granted permission to participate in the study was compiled. This list was used as a roster for email distribution.
Table 7

Parental Consent Form Return Rates

<table>
<thead>
<tr>
<th>Returned parental consent forms</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental consent forms distributed</td>
<td>943</td>
</tr>
<tr>
<td>Total consent forms returned</td>
<td>260</td>
</tr>
<tr>
<td>Middle School</td>
<td></td>
</tr>
<tr>
<td>Approved</td>
<td>136</td>
</tr>
<tr>
<td>Declined</td>
<td>41</td>
</tr>
<tr>
<td>High School</td>
<td></td>
</tr>
<tr>
<td>Approved</td>
<td>66</td>
</tr>
<tr>
<td>Declined</td>
<td>17</td>
</tr>
<tr>
<td>Total approved consent forms</td>
<td>202</td>
</tr>
<tr>
<td>Total declined consent forms</td>
<td>58</td>
</tr>
</tbody>
</table>

**Instrument**

An email with the link to the instrument was sent to each student on the list via the closed email system maintained by the school district. Following instrument distribution, another email message was sent to subjects reminding them to submit their completed instrument.

The instrument (see Appendix B) consisted of 65 items. Of the 65 items, 5 items comprised the physical activity subscale that measured levels of individual physical activity behavior. The dietary behavior subscale consisted of 9 items and measured individual dietary behaviors based on food choices. To indicate level of social support for physical activity provided by the family, the physical activity social support subscale
consisting of 13 items was included in the instrument. The 13-item subscale was used to measure level of support for physical activity from friends, and a single item was used to reveal the extent to which subjects reported that their school provided social support for physical activity.

To indicate level of dietary social support provided by the family, the dietary social support subscale consisting of 10 items was included in the instrument. The 10-item subscale was used to measure level of support for dietary behavior from friends, and a single item was used to reveal the extent to which subjects reported that their school provided social support for dietary behavior.

A single item indicated academic achievement. This item was used to measure the level of academic achievement based on self-reported grades for the past year.

Further, three items were used as demographic indicators. These items were used to identify subject age, gender, and student status. Table 8 shows a summary of the number of items for each study variable.

Of the 202 students who received the link to the instrument from the closed email system managed by the school district, 75(37.1%) completed the instrument. As shown in Table 9, of the 75 completed instruments, 37 were from subjects reporting to be enrolled at the middle school whereas 25 were from subjects reporting to be students the high school. In addition, 13 subjects did not identify student status as either middle school or high school. Of the 75 completed instruments, 13 were deemed unusable due to the fact that the instrument contained incomplete or missing responses. As such, the total number of usable cases was 62 \((n = 62; \text{Table 10})\).
Table 8

*Number of Items Per Study Variable*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity</td>
<td>5</td>
</tr>
<tr>
<td>Dietary Behavior</td>
<td>9</td>
</tr>
<tr>
<td>Family Physical Activity Social Support</td>
<td>13</td>
</tr>
<tr>
<td>Friend Physical Activity Social Support</td>
<td>13</td>
</tr>
<tr>
<td>School Physical Activity Social Support</td>
<td>1</td>
</tr>
<tr>
<td>Family Dietary Social Support</td>
<td>10</td>
</tr>
<tr>
<td>Friend Dietary Social Support</td>
<td>10</td>
</tr>
<tr>
<td>School Dietary Social Support</td>
<td>1</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>1</td>
</tr>
<tr>
<td>Demographics</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 9

*Instrument Completion by Student Status*

<table>
<thead>
<tr>
<th>Student Status</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle School</td>
<td>37</td>
</tr>
<tr>
<td>High School</td>
<td>25</td>
</tr>
<tr>
<td>Did not identify student status</td>
<td>13</td>
</tr>
</tbody>
</table>
Descriptive Statistics

Once data were collected and downloaded from the Qualtrics survey website to SPSS software, it was inspected visually and frequency analyses were conducted. Data analysis then moved to the stage of creating study variables. These variables included physical activity and dietary behavior total scores, and the social support variables. The social support variables included a total social support for physical activity and total social support for dietary behavior level and subscales for family physical activity social support, friend physical activity social support, school physical activity social support, family dietary social support, friend dietary social support, and school dietary social support (Table 8).

Two items in the physical activity scale and one item in the dietary behavior scale were reverse coded so that the sum would confirm that the highest score reflected more physical activity and healthier dietary behaviors. The reverse coded items in the physical activity scale included:

- Item 2: “On an average school day, how many hours do you watch TV?”
- Item number 3: “On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Count time spent on things such as Xbox, PlayStation, an iPod, an iPad or other tablet, a smartphone, YouTube, Facebook or other social networking tools, and the Internet.)”

The reverse coded items in the dietary behavior scale included:
• Item 12: “During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)”

After the reverse coding, response scores of physical activity question items and dietary behavior items were summed to create physical activity and dietary behavior variables for further analysis.

Additionally, 4 items in the dietary social support subscale and 3 items in the physical activity social support subscales were reverse coded to create the physical activity and social support scales. These were reverse coded as per the scale developers’ instruction. The physical activity social support items were reverse coded to reflect a sum score in which the higher the score, the higher the physical activity social support.

The physical activity social support items that were reverse coded included the following statements in items 15.7-15.9 for both family and friends physical activity social support subscales:

• “complained about the time I spend exercising”
• “criticized me or made fun of me for exercising”
• “gave me rewards for exercising”

The dietary social support items were reverse coded for the sum to indicate the higher the score, the more dietary social support. The dietary social support variables that were reverse coded were items 16.6-16.10 for both family and friends dietary social support subscales. These included the following statements:

• “ate high fat or high salt foods in front of me”
After the reverse coding, consistent with all other variables, all social support items were inspected visually to identify missing data. In addition, all Does Not Apply responses were coded with the value of 0, then all 0 values per person were counted. As a result of the findings from the pilot study, “rule 1” was implemented. “Rule 1” was developed by the researcher to manage situations in which a subject responded Does Not Apply to more than 50% of the items on any social support subscale. All subjects’ responses in a subscale were considered missing data for that subscale if the 50% rule applied. Once “rule 1” was applied, the scores for the social support subscales were calculated using guidelines provided by the original scale developers (Sallis et al., 1987).

A total social support for physical activity variable was created using the guidelines provided by original scale developers’ guidelines (Sallis et al., 1987). The school physical activity social support item was added to that score to create the total physical activity social support variable score. Further, three subcategories were created corresponding to the family support for physical activity, friend support for physical activity, and school social support variables.

A total social support for dietary behavior variable was created using the guidelines provided by original scale developers’ directions (Sallis et al., 1987). The school dietary social support item was added to that score to create the total dietary social
support variable score. Further, three subcategories were created corresponding to the family support for dietary behavior, friend support for dietary behavior, and school social support for dietary behavior variables. Total and average scores were then calculated for each of the study’s variables in the study.

**Demographics**

The population for this study consisted of all male and female middle and high school students enrolled in a Northeast Ohio public school district during the 2013-2014 school year. In specific, middle school students included those who were enrolled in 7th and 8th grades, whereas the high school subject pool included students in 9th through 12th grades. Of the 75 subjects who participated in the study, their ages ranged from 12 to 18 years old. Among them, 24 subjects identified themselves as male whereas the remaining 38 identified themselves as female. Thirty-four subjects reported that they were enrolled currently at the middle school, and 28 reported that they were high school students (Table 10).

**Physical Activity**

The physical activity subscale consisted of five items. The response set for physical activity was represented as a continuous variable. In item 1, in which subjects indicated how many days in the past 7 days they participated in at least 60 minutes of physical activity, scores ranged from 1 to 8. The response set was represented as a continuous variable where 1 indicated 0 days of at least 60 minutes of physical activity and a score of 8 indicated 7 days of at least 60 minutes of physical activity.
Table 10

Population Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>9</td>
<td>14.5</td>
</tr>
<tr>
<td>13</td>
<td>20</td>
<td>32.3</td>
</tr>
<tr>
<td>14</td>
<td>16</td>
<td>25.8</td>
</tr>
<tr>
<td>15</td>
<td>12</td>
<td>19.3</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>6.5</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>1.6</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>24</td>
<td>38.7</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>61.3</td>
</tr>
<tr>
<td>Student Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle School</td>
<td>34</td>
<td>54.8</td>
</tr>
<tr>
<td>High School</td>
<td>28</td>
<td>45.2</td>
</tr>
</tbody>
</table>

In item 2, in which subjects indicated how many hours they watched TV on an average school day, scores ranged from 1 to 7. The response set was represented in a continuous variable where 1 equaled “I do not watch TV on the average school day” and 7 indicated 5 or more hours of TV watching on an average school day.

Item 3, in which subjects indicated how many hours they played video or computer games for something that is not schoolwork on an average school day, scores ranged from 1 to 8. The response set as represented in a continuous variable where 1 indicated that no computer or video game was played or computer used for non-school purposes on an average school day and 8 indicated 5 or more hours per day of use.
Item 4, in which subjects indicated how many days they go to physical education class on an average week, scores ranged from 1 to 6. The response set was represented as a continuous variable where 1 equals 0 days and 6 equal 5 days.

Item 5, in which subjects indicated how many sports team they played in the past 12 months, scores ranged from 1 to 4. The response set was represented as a continuous variable, where 1 equals 0 teams and 4 equals 3 or more teams.

Once items 2 and 3 were reverse coded, a total physical activity score was computed to create the Physical Activity variable. The total physical activity score response set ranged with a minimum score of 7 and maximum of 25. Higher total scale scores represented subjects who were more physically activity than their counterparts who received lower scores. Among subjects (N = 69), scores ranged from 7 to 24, the average was 16.41 and the standard deviation was 3.55 (Table 11).

**Dietary Behavior**

The dietary behavior scale consisted of nine items. The response set for dietary behavior was represented as a continuous variable.

Item 6 indicated how many times the subjects drank 100% fruit juices in the past days. The response set was represented in a continuous variable ranging from 1 to 7 where 1 indicated not drinking any 100% fruit juices and 7 indicated drinking 4 or more 100% fruit juices per day.
### Table 11

**Physical Activity Scale Descriptive Statistics**

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>During the past 7 days, on how many days were you physically active for a total of at least 60 minutes a day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)</td>
<td>73</td>
<td>1</td>
<td>8</td>
<td>5.82</td>
<td>1.836</td>
</tr>
<tr>
<td>On an average school day, how many hours do you watch TV?</td>
<td>73</td>
<td>1</td>
<td>7</td>
<td>2.85</td>
<td>1.371</td>
</tr>
<tr>
<td>On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Count times spent on things such as Xbox, PlayStation, an iPod, an iPad or other tablet, a smartphone, YouTube, Facebook, or other social networking tools, and the Internet.)</td>
<td>72</td>
<td>1</td>
<td>8</td>
<td>3.38</td>
<td>1.732</td>
</tr>
<tr>
<td>In an average week when you are in school, on how many days do you go to physical education (PE) classes?</td>
<td>72</td>
<td>1</td>
<td>6</td>
<td>2.93</td>
<td>1.818</td>
</tr>
<tr>
<td>During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)</td>
<td>73</td>
<td>1</td>
<td>4</td>
<td>3.15</td>
<td>.908</td>
</tr>
</tbody>
</table>

Item 7 indicated how many times a subject ate fruit in the past 7 days. The response set was represented in a continuous variable ranging from 1 to 7 where 1 represented eating 0 fruits and 7 represented eating fruits 4 or more times per day.

Item 8 indicated how many times the subject ate a salad in the past 7 days. The response set was a continuous variable ranging from 1 to 7 where 1 equals “did not eat a salad in the past 7 days” and 7 equals eating salads 4 or more times per day.
Item 9 indicated how many times the individual ate potatoes (not counting potato chips or French fries) in the past 7 days. The response set was represented in a continuous variable ranging from 1 to 7 where 1 represented that the subject did not eat potatoes in the past 7 days and 7 represented eating potatoes 4 or more times per day.

Item 10 indicated how many times the subject ate carrots in the past 7 days. The response set was represented in a continuous variable ranging from 1 to 7 where 1 equals eating 0 carrots and 7 equals eating carrots 4 or more times per day.

Item 11 indicated how many times the subject ate other vegetables (not counting salad, potatoes, or carrots) in the past 7 days. The response set was represented in a continuous variable ranging from 1 to 7 where 1 equals did not eat any other vegetables in the past 7 days and 7 equals ate another vegetable 4 or more times per day.

Item 12 indicated how many time during the past 7 days the subject drank a can, bottle, or glass of soda or pop. After reverse coding this item, the response set was represented as a continuous variable ranging from 1 to 7 where 1 indicated drinking 4 or more per day and 7 indicated not drinking any soda or pop in the past 7 days.

Once item 12 was reverse coded, a total dietary behavior score was computed to create the dietary behavior variable. High scores represented subjects who reported healthier dietary behavior. Among subjects ($n = 73$), the average dietary behavior score was 33.9 with a standard deviation of 6.11 and a range of 21 to 51 (Table 12).
Table 12

*Dietary Behavior Scale Descriptive Statistics*

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)</td>
<td>73</td>
<td>1</td>
<td>7</td>
<td>2.55</td>
<td>1.415</td>
</tr>
<tr>
<td>During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)</td>
<td>73</td>
<td>2</td>
<td>7</td>
<td>4.38</td>
<td>1.497</td>
</tr>
<tr>
<td>During the past 7 days, how many times did you eat green salad?</td>
<td>73</td>
<td>1</td>
<td>6</td>
<td>2.34</td>
<td>1.227</td>
</tr>
<tr>
<td>During the past 7 days, how many times did you eat potatoes? (Do not count French fries, fried potatoes, or potato chips.)</td>
<td>73</td>
<td>1</td>
<td>3</td>
<td>1.62</td>
<td>.568</td>
</tr>
<tr>
<td>During the past 7 days, how many times did you eat carrots?</td>
<td>73</td>
<td>1</td>
<td>7</td>
<td>2.21</td>
<td>1.333</td>
</tr>
<tr>
<td>During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)</td>
<td>73</td>
<td>1</td>
<td>7</td>
<td>3.64</td>
<td>1.503</td>
</tr>
<tr>
<td>During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite. (Do not count diet soda or diet pop.)</td>
<td>73</td>
<td>1</td>
<td>5</td>
<td>1.68</td>
<td>1.079</td>
</tr>
<tr>
<td>During the past 7 days, how many glasses of milk did you drink? (Count the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)</td>
<td>73</td>
<td>1</td>
<td>7</td>
<td>3.86</td>
<td>1.735</td>
</tr>
<tr>
<td>During the past 7 days, on how many days did you eat breakfast?</td>
<td>73</td>
<td>1</td>
<td>8</td>
<td>7.00</td>
<td>1.772</td>
</tr>
</tbody>
</table>
Academic Achievement

Academic achievement was measured using a single item. The response set for academic achievement was represented as a continuous variable and represented the grades the subject reported receiving “in the past 12 months” (mostly A’s, mostly B’s, mostly C’s, mostly D’s, mostly F’s or don’t know). In the response set of this item, 1 indicated mostly A’s, 2 indicated mostly B’s, 3 indicated mostly C’s, 4 indicated mostly D’s, 5 indicated mostly F’s and 6 indicated, “don’t know.” Among respondents, scores ranged from 1-2, indicating that all students reported that they earned either mostly A’s or mostly B’s in the past 12 months (Table 13).

Table 13

<table>
<thead>
<tr>
<th>Academic Achievement Descriptive Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>During the past 12 months, how would you</td>
</tr>
<tr>
<td>describe your grades in school?</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>64</td>
</tr>
</tbody>
</table>

Social Support Variables

Nine social support variables, including 6 subscales, were identified and constructed for this study. These include family social support for physical activity subscale, friend social support for physical activity subscale, school social support for physical activity subscale, family social support for dietary behavior subscale, friend social support for dietary behavior subscale, and school social support for dietary
behavior subscale, overall social support, total physical activity social support subscale, and total dietary behavior social support subscale.

Subscales were created for physical activity family support, physical activity friend support, physical activity school support, dietary family social support, dietary friend support and dietary school support. For the physical activity family support subscale, scores ranged from 1.62 to 4.85 with a standard deviation of .821. For physical activity friend support scale, scores ranged from 1.62 to 5.00 with a standard deviation of .834. For physical activity social support from school subscale, scores ranged from 2 to 4 with a standard deviation of .699 (Table 14).

Table 14
Descriptive Statistics for All Social Support Scales

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Physical Activity Support</td>
<td>59</td>
<td>1.62</td>
<td>4.85</td>
<td>.82102</td>
</tr>
<tr>
<td>Friend Physical Activity Support</td>
<td>56</td>
<td>1.62</td>
<td>5.00</td>
<td>.83356</td>
</tr>
<tr>
<td>School Physical Activity Support</td>
<td>63</td>
<td>2.00</td>
<td>4.00</td>
<td>.69928</td>
</tr>
<tr>
<td>Family Dietary Support</td>
<td>61</td>
<td>2.10</td>
<td>5.00</td>
<td>.65348</td>
</tr>
<tr>
<td>Friend Dietary Support</td>
<td>46</td>
<td>1.00</td>
<td>4.40</td>
<td>.60704</td>
</tr>
<tr>
<td>School Dietary Support</td>
<td>63</td>
<td>1.00</td>
<td>4.00</td>
<td>.87930</td>
</tr>
</tbody>
</table>

For the dietary family support subscale, scores ranged from 2.10 to 5 with a standard deviation of .653. For the dietary friend support subscale, scores ranged from 1
to 4.40 with a standard deviation of .607. For the dietary support from school subscale, scores ranged from 1 to 4 with a standard deviation of .879 (Table 14).

**Social Support for Physical Activity**

**Family Physical Activity Social Support**

The family social support for physical activity scale consisted of 13 items. Each item was written as a statement that asked subject to rate the support they received from their family members about physical activity participation in the past 3 months. The response sets for physical activity social support were represented as a continuous scale ranging between 1 (*none*), 2 (*rarely*), 3 (*a few times*), 4 (*often*), 5 (*very often*), and 0 (*does not apply*). Family social support for physical activity represents items 15.1 to 15.13 in the instrument. Each of these items is a statement for which the subject rates in the continuous scale ranging from 1 to 5 regarding social support for engagement in physical activity by family members or members of their household in the past three months. The response set for item 15.1 through 15.6 and 15.10 through 15.13 ranged from 1 to 5 representing the code for the *does not apply* response. A response of 1 represented that family members provided no support for the subject for exercise and a score of 5 represented that family members very often provided support for physical activity. The response set for items 15.7 through 15.9 was reverse coded so that a response of 0 represented a *does not apply* response, a response of 1 represented that family members provided no support for the subject for exercise, and a score of 5 represented that family members very often provided support for physical activity (Table 15).
Table 15

*Physical Activity From Family Social Support Descriptive Statistics*

<table>
<thead>
<tr>
<th>Activity</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercised with me</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>2.73</td>
<td>1.568</td>
</tr>
<tr>
<td>Offered to exercise with me</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>2.87</td>
<td>1.624</td>
</tr>
<tr>
<td>Gave me helpful reminders to exercise (“Are you going to exercise tonight?)</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>2.54</td>
<td>1.721</td>
</tr>
<tr>
<td>Gave me encouragement to stick with my exercise program</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>2.56</td>
<td>1.924</td>
</tr>
<tr>
<td>Changed their schedule so we could exercise together</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>1.71</td>
<td>1.497</td>
</tr>
<tr>
<td>Discussed exercise with me</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>2.71</td>
<td>1.634</td>
</tr>
<tr>
<td>Complained about time I spend exercising</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>3.45</td>
<td>1.989</td>
</tr>
<tr>
<td>Criticized me or made fun of me for exercising</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>3.68</td>
<td>2.109</td>
</tr>
<tr>
<td>Gave me rewards for exercising (bought me something or gave me something I like)</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>1.33</td>
<td>1.191</td>
</tr>
<tr>
<td>Planned for exercise on recreational outings</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>1.87</td>
<td>1.571</td>
</tr>
<tr>
<td>Helped plan activities around my exercise</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>2.05</td>
<td>1.791</td>
</tr>
<tr>
<td>Asked me for ideas on how they can get more exercise</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>1.49</td>
<td>1.354</td>
</tr>
<tr>
<td>Talked about how much they like to exercise</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>1.98</td>
<td>1.540</td>
</tr>
</tbody>
</table>

*Note. 0 = Does not apply response*
Friend Physical Activity Social Support

Subjects were then asked to rate the same 13 statements as it related to the physical activity participation related social support they received from their friends in the past 3 months. The response set for item 15.1 through 15.6 and 15.10-15.13 ranged from 1 to 5 with 0 representing the code for the does not apply response. A response of 1 represented that friends provided no support for the subject for exercise and a score of 5 represented that friends very often provided support for physical activity. The response set for items 15.7 through 15.9 were reverse coded so that a response of 0 represented a does not apply response, a response of 1 represented that friends provided no support for the subject for exercise and a score of 5 represented that friends very often provided support for physical activity (Table 16).

School Physical Activity Social Support

Physical activity social support from school was determined using a single item. The item asked participants to rate on a continuous scale ranging from not at all, a little, some, or very much, the support they have received from school for participation in physical activity by asking “How much does your school encourage you to be physically active?” Scores for this item ranged from 2 to 4 where 2 indicated that the subject received some encouragement from the school to be physically active and a score of 4 indicated that the subject received very much support from the school to be physically active (Table 17).
Table 16

*Physical Activity From Friends Descriptive Statistics*

<table>
<thead>
<tr>
<th>Activity</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercised with me</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>3.05</td>
<td>1.530</td>
</tr>
<tr>
<td>Offered to exercise with me</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>2.48</td>
<td>1.512</td>
</tr>
<tr>
<td>Gave me helpful reminders to exercise (“Are you going to exercise tonight???”)</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>1.69</td>
<td>1.646</td>
</tr>
<tr>
<td>Gave me encouragement to stick with my exercise program</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>1.68</td>
<td>1.637</td>
</tr>
<tr>
<td>Changed their schedule so we could exercise together</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>1.69</td>
<td>1.521</td>
</tr>
<tr>
<td>Discussed exercise with me</td>
<td>61</td>
<td>1</td>
<td>5</td>
<td>2.26</td>
<td>1.662</td>
</tr>
<tr>
<td>Complained about the time I spend exercising</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>3.29</td>
<td>2.060</td>
</tr>
<tr>
<td>Criticized me or made fun of me for exercising</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>3.56</td>
<td>2.116</td>
</tr>
<tr>
<td>Gave me rewards for exercising (bought me something or gave me something I like)</td>
<td>62</td>
<td>1</td>
<td>4</td>
<td>.85</td>
<td>.807</td>
</tr>
<tr>
<td>Planned for exercise on recreational outings</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>1.48</td>
<td>1.400</td>
</tr>
<tr>
<td>Helped plan activities around my exercise</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>1.47</td>
<td>1.434</td>
</tr>
<tr>
<td>Asked me for ideas on how they can get more exercise</td>
<td>62</td>
<td>1</td>
<td>5</td>
<td>1.66</td>
<td>1.414</td>
</tr>
<tr>
<td>Talked about how much they like to exercise</td>
<td>61</td>
<td>1</td>
<td>5</td>
<td>1.82</td>
<td>1.586</td>
</tr>
</tbody>
</table>

*Note. 0 = Does not apply response*
Table 17

School Physical Activity Social Support Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regarding your school: How much does your school encourage you to be physically active?</td>
<td>63</td>
<td>2</td>
<td>4</td>
<td>3.35</td>
<td>.699</td>
</tr>
</tbody>
</table>

Social Support for Dietary Behavior

Family Dietary Social Support

The family social support for dietary behavior scale consisted of 10 items. Each item was a written statement that asked subjects to rate the support they have received from their family members about dietary behavior in the past 3 months. The response sets for dietary social support were represented as a continuous scales ranging between 1 (none), 2 (rarely), 3 (a few times), 4 (often), 5 (very often), and 0 (does not apply).

Family social support for physical activity represents items 16-1 to 16.10 in the instrument. Each of these items is a statement for which the subject rated in the continuous scale ranging from 1 to 5 regarding family members or members of their household in the past three months. The response set for item 16.1 through 16.5 ranged from 1 to 5 with 0 representing the code for the does not apply response. A response of 1 represented that family members provided no support for the subject for healthy dietary behavior and a score of 5 represented that family members very often provided support for healthy dietary behavior. The response set for items 16.6 through 16.10 was reverse coded so that a response of 0 represented a does not apply response, a response of 1
represented that family members provided no support for the subject for healthy dietary behavior, and a score of 5 represented that family members very often provided support for healthy dietary behavior (Table 18).

Table 18

*Dietary Family Support Descriptive Statistics*

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encouraged me not to eat “unhealthy foods” (cake, salted chips) when I’m tempted to do so</td>
<td>66</td>
<td>1</td>
<td>5</td>
<td>2.76</td>
<td>1.646</td>
</tr>
<tr>
<td>Discussed my eating habit changes with me (asked me how I’m doing with my eating changes)</td>
<td>65</td>
<td>1</td>
<td>5</td>
<td>1.62</td>
<td>1.422</td>
</tr>
<tr>
<td>Reminded me not to eat high fat, high salt foods</td>
<td>65</td>
<td>1</td>
<td>5</td>
<td>2.48</td>
<td>1.572</td>
</tr>
<tr>
<td>Complimented me on changing my eating habits (“Keep it up,” “We are proud of you”)</td>
<td>65</td>
<td>1</td>
<td>5</td>
<td>1.98</td>
<td>1.700</td>
</tr>
<tr>
<td>Commented if I went back to my old eating habits</td>
<td>65</td>
<td>1</td>
<td>5</td>
<td>1.29</td>
<td>1.400</td>
</tr>
<tr>
<td>Ate high fat or high salt foods in front of me</td>
<td>63</td>
<td>1</td>
<td>5</td>
<td>3.10</td>
<td>1.411</td>
</tr>
<tr>
<td>Refused to eat the same foods I eat</td>
<td>64</td>
<td>1</td>
<td>5</td>
<td>3.33</td>
<td>2.000</td>
</tr>
<tr>
<td>Brought home foods I m trying not to eat</td>
<td>65</td>
<td>1</td>
<td>5</td>
<td>3.29</td>
<td>2.006</td>
</tr>
<tr>
<td>Got angry when I encouraged them to eat low salt, low fat foods</td>
<td>65</td>
<td>1</td>
<td>5</td>
<td>3.38</td>
<td>2.206</td>
</tr>
<tr>
<td>Offered me food I’m trying not to eat</td>
<td>65</td>
<td>1</td>
<td>5</td>
<td>3.31</td>
<td>2.121</td>
</tr>
</tbody>
</table>

*Note. 0 = Does not apply* response
Friend Dietary Social Support

Subjects were then asked to rate the same 10 statements as it related to the dietary behavior social support they have received from their friends in the past 3 months. The response set for item 16.1 through 16.5 ranged from 1 to 5 where 0 represented a does not apply response. A response of 1 represented that friends provided no support for the subject for healthy dietary behavior and a score of 5 represented that friends very often provided support for healthy dietary behavior. The response set for items 16.6 through 16.10 were reverse coded so that a response of 0 represented a does not apply response, a response of 1 represented that friends provided no support for the subject for healthy dietary behavior and a score of 5 represented that friends very often provided support for healthy dietary behavior (Table 19).

School Dietary Social Support

Dietary social support from school was determined using a single item. The item asked participants to rate on a continuous scale ranging from not at all, a little, some, or very much, the support they have received from school in the item “How much does your school encourage you to eat healthy food?” Scores for this item ranged from 2 to 4 where 2 indicated that the subject received some encouragement from the school to eat healthy food and a score of 4 indicated that the subject received very much support from the school to eat healthy food (Table 20).
Table 19

*Dietary Friends Social Support Descriptive Statistics*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encouraged me not to eat “unhealthy foods” (cake, salted chips) when I’m tempted to do so</td>
<td>60</td>
<td>1</td>
<td>5</td>
<td>1.43</td>
<td>1.345</td>
</tr>
<tr>
<td>Discussed my eating habit changes with me (asked me how I’m doing with my eating changes)</td>
<td>60</td>
<td>1</td>
<td>5</td>
<td>1.07</td>
<td>1.177</td>
</tr>
<tr>
<td>Reminded me not to eat high fat, high salt foods</td>
<td>59</td>
<td>1</td>
<td>5</td>
<td>1.15</td>
<td>1.257</td>
</tr>
<tr>
<td>Complimented me on changing my eating habits (“Keep it up,” “We are proud of you”)</td>
<td>60</td>
<td>1</td>
<td>5</td>
<td>0.98</td>
<td>1.112</td>
</tr>
<tr>
<td>Commented if I went back to my old eating habits</td>
<td>60</td>
<td>1</td>
<td>3</td>
<td>0.85</td>
<td>0.899</td>
</tr>
<tr>
<td>Ate high fat or high salt foods in front of me</td>
<td>60</td>
<td>1</td>
<td>5</td>
<td>2.38</td>
<td>1.776</td>
</tr>
<tr>
<td>Refused to eat the same foods I eat</td>
<td>58</td>
<td>1</td>
<td>5</td>
<td>2.93</td>
<td>2.126</td>
</tr>
<tr>
<td>Brought home foods I m trying not to eat</td>
<td>59</td>
<td>1</td>
<td>5</td>
<td>2.66</td>
<td>2.294</td>
</tr>
<tr>
<td>Got angry when I encouraged them to eat low salt, low fat foods</td>
<td>60</td>
<td>1</td>
<td>5</td>
<td>2.73</td>
<td>2.385</td>
</tr>
<tr>
<td>Offered me food I’m trying not to eat</td>
<td>60</td>
<td>1</td>
<td>5</td>
<td>2.75</td>
<td>2.112</td>
</tr>
</tbody>
</table>

*Note.* 0 = *Does not apply* responses
Table 20

*School Dietary Support Descriptive Statistics*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regarding your school: How much does your school encourage you to eat healthy food?</td>
<td>63</td>
<td>1</td>
<td>4</td>
<td>3.03</td>
<td>0.879</td>
</tr>
</tbody>
</table>

Reliabilities of Social Support Scales

A reliability test was conducted for the social support scales. All scales yielded moderate to high Cronbach’s alpha scores when all cases were included. Once Rule 1, established during the pilot study, was applied excluding those cases that chose *does not apply* for more than 50% of the responses, Cronbach’s alpha scores decreased for all scales. Specifically, “family social support for dietary behavior” and “friend social support for dietary behavior” showed a large decrease from 0.875 to 0.615 and from 0.915 to 0.537, respectively. Table 21 shows the Cronbach’s alpha scores for each of the social support subscales.

Analysis of the Hypotheses

Correlations

A zero odds correlations test was conducted as a preliminary test to inspect the relationships between each pair of study variables. Statistically significant correlations were revealed for each of the following relationships (Table 22).
Table 21

*Reliability Scores for Social Support Scales*

<table>
<thead>
<tr>
<th></th>
<th>All cases (Cronbach’s Alpha)</th>
<th>Usable cases (apply Rule 1) (Cronbach’s Alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Social Support</td>
<td>.949</td>
<td>.883</td>
</tr>
<tr>
<td>Family Social Support For Dietary Behaviors</td>
<td>.875</td>
<td>.615</td>
</tr>
<tr>
<td>Friend Social Support For Dietary Behaviors</td>
<td>.915</td>
<td>.537</td>
</tr>
<tr>
<td>Family Social Support For Physical Activity</td>
<td>.92</td>
<td>.86</td>
</tr>
<tr>
<td>Friend Social Support For Physical Activity</td>
<td>.922</td>
<td>.84</td>
</tr>
</tbody>
</table>

- Family Physical Activity Support and Family Support on Dietary Behavior ($p = .000, r = .47$). This was a positive correlation, as family physical activity support increased, family support on dietary behavior increased.

- School Physical Activity Support and Family Support on Dietary Support ($p = .035, r = .27$). This is a positive correlation, as school physical activity support increased, family dietary support increased.

- Family Physical Activity Support and Dietary Behaviors ($p = .23, r = .30$), as family physical activity support increased, healthy dietary behaviors increased.

- Family Physical Activity Support and School Physical Activity Support ($p = .024, r = .29$). This is a positive correlation, as family physical activity support increased, school physical activity support increased.
### Table 22

**Correlations**

<table>
<thead>
<tr>
<th></th>
<th>Physical Activity total score</th>
<th>Dietary behaviors total score</th>
<th>Family Physical Activity support average score</th>
<th>Friend Physical Activity support average score</th>
<th>School Physical Activity support school</th>
<th>Family Dietary support average score</th>
<th>Friend Dietary support average School Dietary support</th>
<th>Total Physical Activity Support</th>
<th>Total Dietary Support</th>
<th>Average score of all social support questions</th>
<th>Academic Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity total score</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>135</td>
<td>235</td>
<td>242</td>
<td>221</td>
<td>058</td>
<td>195</td>
<td>369**</td>
<td>341**</td>
<td>182</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.004</td>
<td>0.007</td>
<td>0.139</td>
<td>0.220</td>
<td>0.200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>69</td>
<td>69</td>
<td>55</td>
<td>52</td>
<td>59</td>
<td>43</td>
<td>47</td>
<td>61</td>
<td>61</td>
<td>47</td>
</tr>
<tr>
<td>Dietary behaviors total score</td>
<td>Pearson Correlation</td>
<td>135</td>
<td>1</td>
<td>296*</td>
<td>170</td>
<td>153</td>
<td>210</td>
<td>074</td>
<td>121</td>
<td>271*</td>
<td>148</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.093</td>
<td>0.065</td>
<td>0.099</td>
<td>0.099</td>
<td>0.099</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N</td>
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<td>69</td>
<td>55</td>
<td>52</td>
<td>59</td>
<td>43</td>
<td>47</td>
<td>61</td>
<td>61</td>
<td>47</td>
</tr>
<tr>
<td>Family Physical Activity support average score</td>
<td>Pearson Correlation</td>
<td>154</td>
<td>154</td>
<td>0.023</td>
<td>194</td>
<td>294*</td>
<td>0.474**</td>
<td>0.383**</td>
<td>0.085</td>
<td>597**</td>
<td>247</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.550</td>
<td>0.59</td>
<td>0.093</td>
<td>0.019</td>
<td>0.099</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>56</td>
<td>56</td>
<td>45</td>
<td>59</td>
<td>59</td>
<td>59</td>
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</tr>
<tr>
<td>Friend Physical Activity support average score</td>
<td>Pearson Correlation</td>
<td>235</td>
<td>0.093</td>
<td>0.018</td>
<td>0.194</td>
<td>1</td>
<td>240</td>
<td>0.029</td>
<td>0.272*</td>
<td>0.714**</td>
<td>0.531**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.093</td>
<td>0.018</td>
<td>0.194</td>
<td>1</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N</td>
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<td>0.194</td>
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<td>240</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>School Physical Activity support school</td>
<td>Pearson Correlation</td>
<td>242</td>
<td>0.065</td>
<td>0.231</td>
<td>0.153</td>
<td>0.294**</td>
<td>0.240</td>
<td>1</td>
<td>0.274*</td>
<td>0.100</td>
<td>0.664**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.016</td>
<td>0.058</td>
<td>0.005</td>
<td>0.005</td>
<td>0.035</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N</td>
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<td>0.065</td>
<td>0.058</td>
<td>0.005</td>
<td>0.005</td>
<td>0.035</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Family Dietary support average score</td>
<td>Pearson Correlation</td>
<td>0.099</td>
<td>0.104</td>
<td>0.000</td>
<td>0.383**</td>
<td>0.029</td>
<td>0.274**</td>
<td>0.248</td>
<td>0.238</td>
<td>0.022</td>
<td>0.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<td>0.104</td>
<td>0.035</td>
<td>0.101</td>
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<td>0.000</td>
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<td>0.000</td>
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<tr>
<td>School Dietary support</td>
<td>Pearson Correlation</td>
<td>0.043</td>
<td>0.195</td>
<td>0.121</td>
<td>0.520</td>
<td>0.085</td>
<td>0.272**</td>
<td>0.664**</td>
<td>0.038</td>
<td>0.477**</td>
<td>1</td>
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<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.000</td>
<td>0.004</td>
<td>0.004</td>
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<tr>
<td>Total Physical Activity Support</td>
<td>Pearson Correlation</td>
<td>0.369**</td>
<td>0.271</td>
<td>0.597**</td>
<td>0.714**</td>
<td>0.551**</td>
<td>0.294**</td>
<td>0.157</td>
<td>0.477**</td>
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<td>0.480**</td>
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<tr>
<td>Sig. (2-tailed)</td>
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<td>0.005</td>
<td>0.000</td>
<td>0.000</td>
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<td>0.000</td>
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<tr>
<td>Total Dietary Support</td>
<td>Pearson Correlation</td>
<td>0.341**</td>
<td>0.211</td>
<td>0.247</td>
<td>0.040</td>
<td>0.299**</td>
<td>0.486**</td>
<td>0.485**</td>
<td>0.427**</td>
<td>0.480**</td>
<td>0.255</td>
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<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.007</td>
<td>0.091</td>
<td>0.059</td>
<td>0.072</td>
<td>0.017</td>
<td></td>
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</tr>
<tr>
<td>N</td>
<td></td>
<td>0.007</td>
<td>0.091</td>
<td>0.059</td>
<td>0.072</td>
<td>0.017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average score of all social support questions</td>
<td>Pearson Correlation</td>
<td>0.182</td>
<td>0.148</td>
<td>0.764**</td>
<td>0.531**</td>
<td>0.358**</td>
<td>0.621**</td>
<td>0.473**</td>
<td>0.198</td>
<td>0.593**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>N</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>Pearson Correlation</td>
<td>0.139</td>
<td>-0.286*</td>
<td>0.115</td>
<td>-0.110</td>
<td>-0.261*</td>
<td>-0.074</td>
<td>-0.287*</td>
<td>0.005</td>
<td>0.073</td>
<td>0.037</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.598</td>
<td>0.598</td>
<td>0.598</td>
<td>0.598</td>
<td>0.598</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>0.598</td>
<td>0.598</td>
<td>0.598</td>
<td>0.598</td>
<td>0.598</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** **Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).
• Physical Activity and Dietary Behavior ($p = .043, r = .27$). This was a positive correlation. As physical activity increased, healthy dietary behaviors increased.

• Physical Activity and Total Dietary Support ($p = .023, r = .30$). This is a positive correlation, as physical activity increased, total dietary support increased.

• Physical Activity and Total Physical Activity Support ($p = .004, r = .37$). This is a positive correlation, as physical activity increased, total physical activity support increased.

• School Physical Activity Support and Physical Activity ($p = .017, r = .299$). This is a positive correlation, as school physical activity support increased, physical activity increased.

Results for Research Questions

Research Question 1. Is there a relationship between Dietary Social Support and Dietary Behavior when Physical Activity is considered? In order to answer this research question, the following hypothesis was analyzed:

$H0$: There is no statistically significant relationship between dietary social support and dietary behavior when physical activity is considered.

$H1$: There was a statistically significant relationship between dietary social support and dietary behavior when physical activity is considered.

To test this relationship, a multiple regression test was conducted. According to the overall regression model predicting a relationship between dietary behavior and total
dietary social support when physical activity is considered (Table 23), no statistical significance was revealed at $p \leq .05$. When the model was entered only as social support, the model significance was $p = .155$, $R = .189$. Once physical activity was entered in the model, the significance was $p = .364$, $R = .190$.

**Research Question 1a.** If yes, was this relationship influenced by age and sex?

*H0:* The statistical significance of this relationship will not be influenced by age and/or sex.

*H1.* The statistical significance of this relationship will be influenced by age and/or sex.

When age and sex were entered into the model, the R increases slightly to $R = .193$ ($p = .727$) but the model remained not statistically significant (Table 24).

In conclusion, the overall model revealed that there was no statistical significance between Dietary Social Support and Dietary Behavior when Physical Activity was considered. This suggests that there was no relationship between total dietary social support and dietary behavior when physical activity was considered. When gender and age were included in the model no statistical significant relationship was revealed. The null hypothesis is accepted for both research question 1 and research question 1a.
Table 23

*Regression Model When Dependent Variable is Dietary Behavior—Testing Hypotheses 1 and 1a*

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R2</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Support</td>
<td>.189</td>
<td>.036</td>
<td>.155</td>
</tr>
<tr>
<td>Social Support &amp; Physical Activity</td>
<td>.190</td>
<td>.036</td>
<td>.364</td>
</tr>
<tr>
<td>Social Support &amp; Physical Activity &amp; Age &amp; Sex</td>
<td>.193</td>
<td>.037</td>
<td>.727</td>
</tr>
</tbody>
</table>

**Research Question 2.** Is there a relationship between Dietary family, friends, and/or school social support and dietary behavior? In order to answer this research question, the following hypothesis was analyzed:

*H0:* There is no statistically significant relationship between family, friends, and/or school social support and dietary behavior.

*H1:* There is a significant relationship between family, friends, and/or school dietary social support and dietary behavior.

To test this relationship a multiple regression test was conducted. According to the regression models predicting dietary behavior by dietary family social support, dietary activity friend social support, and/or dietary activity school social support (Table 24), the model was not statistically significant at $p \leq .05$ ($p = .518$, $R = .234$, $R^2 = .055$). This suggests no relationship was revealed between dietary family, friends, or schools.
social support and dietary behavior. This finding indicates that among the subjects in this study, dietary social support is not a predictor of dietary behavior.

**Research Question 2a.** If yes, was this relationship influenced by age and sex? In order to answer this research question, the following hypothesis was analyzed:

*H0:* The statistical significance of this relationship will not be influenced by age and/or sex.

*H1:* The statistical significance of this relationship will be influenced by age and/or sex.

When age and gender were included in the model, R increases slightly to $R = .265$ ($p = .718$, $R^2 = .070$). The slight increase in $R^2$ from .055 to .070 represents a 2% increase, indicating a tendency. This tendency may suggest a possible relationship (Table 18).

In conclusion, the overall model revealed that there was no statistical significant relationship between family, friends, and school dietary social support and dietary behavior. This indicates that there was no statistically significant relationship between individual social support variables and dietary behavior. When gender and age were included in the model, no statistical significance was revealed. The null hypothesis was accepted for both research questions 2 and 2a. Table 24 presents the regression model analysis when dietary behavior was the dependent variable.
Table 24

Regression Model When Dietary Behavior is the Dependent Variable—Hypothesis 2 and 2a

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R2</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary Family Social Support &amp; Dietary Friend Social Support &amp; Dietary School Social Support</td>
<td>.234</td>
<td>.055</td>
<td>.518</td>
</tr>
<tr>
<td>Social Support &amp; Age &amp; Sex</td>
<td>.265</td>
<td>.070</td>
<td>.718</td>
</tr>
</tbody>
</table>

Research Question 3. Is there a relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered? In order to test this research question, the following hypothesis was analyzed:

\( H_0 \): There is no statistically significant relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered.

\( H_1 \): There is a statistically significant relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered.

To test this relationship, a multiple regression test was conducted. According to the regression model predicting physical activity by total physical activity social support when dietary behavior was considered, there was no statistical significance when \( p \leq .05 \) (\( p = .082 \)). According to the model, when total social support was considered, the model was significant at \( p = .004 \) (\( R = .370, R^2 = .137 \)). Once dietary behavior was entered in the model, the model was still significant at \( p = .015 \) (\( R = .375, R^2 = .141 \)). This indicates that 14.1% of the physical activity variance could be explained by total physical activity social support and dietary behavior (Table 24).
**Research Question 3a.** If yes, was this relationship influenced by age and sex?

In order to answer this question the following hypothesis was analyzed:

*H0:* The statistical significance of this relationship will not be influenced by age and/or sex.

*H1:* The statistical significance of this relationship will be influenced by age and sex. When age and sex were entered, the model became not significant ($p = .082, R = .377$; Table 24).

In conclusion, although the overall model revealed no statistical significant relationship between physical activity social support and physical activity when dietary behavior was considered at last entry, it was significant when only total social support variable was in the model ($R^2 = 0.137$ and $p < 0.05$) and when total social support and dietary behavior variable was in the model ($R^2 = 0.141$ and $p < 0.05$). This suggested a positive relationship between physical activity and social support on physical activity. This relationship remained significant when dietary behavior was considered. This statistically significant relationship, however, was greatly influenced by age and sex.

When age and sex were entered in to the model, the overall model became insignificant. Table 25 shows the regression model when physical activity is the dependent variable.
Research Question 4. Is there a relationship between Physical activity family, friends, and/or school social support and physical activity? In order to answer this research question, the following hypothesis was analyzed:

\( H0: \) There is no statistically significant relationship between family, friends, and/or school social support and physical activity.

\( H1: \) There is a statistically significant relationship between family, friends, and/or school social support and physical activity.

To test this relationship, a multiple regression test was conducted. According to the regression models predicting physical activity by physical activity family social support, physical activity friend social support, and/or physical activity school social support, the model was not statistically significant when \( p \leq .05 \) (\( p = .061 \)) as shown in Table 27. Although \( p \) was not significant, \( R = .391 \) and \( R^2 = .153 \), explaining 15.3% of variance of physical activity behavior. This may indicate that while this model was not statistically significant (Table 27), there may be a tendency apparent. This tendency may indicate that this relationship may need further exploration. Further, of the three social support categories, the study found the strongest relationship when the model included all three social support categories (physical activity family social support, physical activity friend social support, and physical activity school social support).

Table 25

Regression Models When Physical Activity is the Dependent Variable—Testing Hypotheses 3 and 3a

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Social Support</td>
<td>.370</td>
<td>.137</td>
<td>.004</td>
</tr>
<tr>
<td>Total Social Support &amp; Dietary Behavior</td>
<td>.375</td>
<td>.141</td>
<td>.015</td>
</tr>
<tr>
<td>Social Support &amp; Dietary Behavior &amp; Age &amp; Sex</td>
<td>.377</td>
<td>.142</td>
<td>.082</td>
</tr>
</tbody>
</table>
support variables, only social support from school was found to be statistically significant ($p = .046$) as shown in Table 26. This suggests a relationship between school physical activity social support and physical activity.

**Research Question 4a.** If yes, was this relationship influenced by age and sex? In order to answer this research question the following hypothesis was analyzed: $H_0$: The statistical significance of this relationship will not be influenced by age and/or sex.

$H_1$: The statistical significance of this relationship will be influenced by age and/or sex.

When age and sex were included in the regression model, the model became not statistically significant at $p \leq .05$ ($p = .203$, $R = .392$, $R^2 = .154$; Table 24).

In conclusion, according to the regression models predicting physical activity by physical activity family social support, physical activity friend social support, and/or physical activity school social support, the model was not statistically significant. Importantly, however, of the three social support variables, social support from school was found to statistically significant as shown in Table 26.
Table 26

*Social Support for Physical Activity Social Support Subscales—Social Support Scale*

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity Family Social Support</td>
<td>.819</td>
</tr>
<tr>
<td>Physical Activity Friend Social Support</td>
<td>.489</td>
</tr>
<tr>
<td>Physical Activity School Social Support</td>
<td>.046</td>
</tr>
</tbody>
</table>

Although a positive predictive factor found between physical activity social support and physical activity, when age and gender were included in the model, the physical activity social support from school value becomes not statistically significant at $p = .058$, suggesting an interaction between physical activity and age and gender (see Table 27).

Table 27

*Regression Model When Physical Activity is the Dependent Variable—Research Questions 4 and 4a*

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R2</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity Family Social Support &amp; Physical Activity Friend Social Support &amp; Physical Activity School Social Support</td>
<td>.391</td>
<td>.153</td>
<td>.061</td>
</tr>
<tr>
<td>All Physical Activity Social Support &amp; Age &amp; Sex</td>
<td>.392</td>
<td>.154</td>
<td>.203</td>
</tr>
</tbody>
</table>

**Research Question 5.** Is there a relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered? In order to answer this research question, the following hypothesis was analyzed:
H0: There is no statistically significant relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered.

H1: There is a statistically significant relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered.

To test this relationship, a binary logistic regression test was conducted. Due to limited variations observed in the data collected about academic achievement, the academic achievement variable has been treated as a dichotomous variable for either an A grade or a B grade. Thus, a binary logistic regression analysis was conducted to predict the odds of a subject to get an A versus a B grade when compared by social support level, physical activity, and dietary behavior. As Table 28 shows, even though the Cox & Snell R Square and Nagelkerke R were found to be moderately high (0.319 and 0.569, respectively), the overall model revealed no statistical significance at $p < 0.05$ level (actual $p = 0.059$).

Table 28

<table>
<thead>
<tr>
<th>Logistic Regression Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2 Log Likelihood</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Model Summary</td>
</tr>
</tbody>
</table>
Findings in Table 29 show the odds ratio results for the logistic regression analysis. The odds ratio indicates the likelihood of a subject getting an A instead of a B grade when various social support scales scores increase. Even though the obtained odds ratio vary below and above 1.0, their respective 95% confidence intervals all cross over 1.0, indicating that the odds ratios are not statistically significant.

Table 29

*Logistic Regression Odds Ratios*

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratios</th>
<th>95% CI Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary Behavior</td>
<td>1.321</td>
<td>.90</td>
<td>1.94</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>.735</td>
<td>.41</td>
<td>1.31</td>
</tr>
<tr>
<td>Family Dietary Behavior Support</td>
<td>11.101</td>
<td>.10</td>
<td>1225.94</td>
</tr>
<tr>
<td>Friend Dietary Behavior Support</td>
<td>.92</td>
<td>.03</td>
<td>29.98</td>
</tr>
<tr>
<td>School Dietary Behavior Support</td>
<td>.666</td>
<td>.28</td>
<td>333.74</td>
</tr>
<tr>
<td>Family Physical Activity Support</td>
<td>.038</td>
<td>.00</td>
<td>6.22</td>
</tr>
<tr>
<td>Friend Physical Activity Support</td>
<td>6.108</td>
<td>.23</td>
<td>162.03</td>
</tr>
<tr>
<td>School Physical Activity Support</td>
<td>.229</td>
<td>.01</td>
<td>4.87</td>
</tr>
</tbody>
</table>

**Research Question 5a.** If yes, was this relationship influenced by age and sex?

*H0:* The statistical significance of this relationship will not be influenced by age and/or sex.

*H1:* The statistical significance of this relationship will be influenced by age and/or sex.
When gender and age were included in the model there was still no statistical significance revealed.

**Research Question 5b.** If yes, were both social support variables (Physical Activity and/or Dietary Behavior) significant?

*H0:* Neither social support variable will be significant in predicting academic achievement

*H1:* At least one social support variable will be significant in predicting academic achievement

Since no statistical significance was revealed by research question 5, the null hypothesis is accepted for hypothesis 5b.

In conclusion, the overall model revealed no statistical insignificance, indicating that there was no relationship between social support (physical activity and dietary behavior) and academic achievement when physical activity and dietary behavior were considered. When gender and age were included in the model there was still no statistical significance revealed.

**Summary**

In summary, results of preliminary bivariate correlation analysis revealed the following statistically significant relationships between study variables:

- Family Physical Activity Support and Family Support on Dietary Behavior (*p* = .000, *r* = .47). This was a positive correlation, as family physical activity support increased, family support on dietary behavior increased.
School Physical Activity Support and Family Dietary Support \((p = .035, r = .27)\). This is a positive correlation, as school physical activity support increased, family dietary support increased.

Family Physical Activity Support and Dietary Behaviors \((p = .23, r = .30)\), as family physical activity support increased, healthy dietary behaviors increased.

Family Physical Activity Support and School Physical Activity Support \((p = .024, r = .29)\). This is a positive correlation, as family physical activity support increased, school physical activity support increased.

Physical Activity and Dietary Behavior \((p = .043, r = .27)\). This was a positive correlation. As physical activity increased, healthy dietary behaviors increased.

Physical Activity and Total Dietary Support \((p = .023, r = .30)\). This is a positive correlation, as physical activity increased, total dietary support increased.

Physical Activity and Total Physical Activity Support \((p = .004, r = .37)\). This is a positive correlation, as physical activity increased, total physical activity support increased.

School Physical Activity Support and Physical Activity \((p = .017, r = .299)\). This is a positive correlation, as school physical activity support increased, physical activity increased.

After conducting the multiple regression analysis and binary logistic regression analysis, the following was revealed regarding the research questions.
Hypothesis 1

- A multiple regression test revealed no statistically significant relationship between dietary social support and dietary behavior when physical activity was considered.

- The results suggest that regardless of the level of physical activity, no relationship exists between dietary social support and dietary behavior.

- The findings suggest that dietary social support is not a predictive factor for dietary behavior.

Hypothesis 1a

- A multiple regression test revealed no statistical significance when age and sex were included in model testing the relationship between dietary social support and dietary behavior when physical activity is considered.

- This suggests that age and gender do not have an influence in the relationship between dietary social support and dietary behavior regardless if physical activity is present.

Hypothesis 2

- A multiple regression test revealed no statistically significant relationship between family, friends, and school social support and dietary behavior.

- These findings suggest that no relationship is exists between the individual dietary behavior social support scales (family, friends, and school) and dietary behavior.
• These findings indicate that the individual dietary social support scales (family, friends, and school social support) are not predictive factors of dietary behavior.

Hypothesis 2a

• A multiple regression test revealed no statistically significance when age and gender are included in the model predicting a relationship between family, friends, and school social support and dietary behavior.

• This suggests that age and gender do not have an influence in the relationship between the individual social support scales (family, friends, and school) and dietary behavior.

Hypothesis 3

• A multiple regression test revealed a statistically significant relationship between physical activity social support and physical activity when dietary behavior is considered.

• These findings suggest when dietary behavior is considered, a relationship is found between physical activity social support and physical activity.

• This suggests that physical activity social support is a predictor of physical activity.

Hypothesis 3a

• A multiple regression test revealed no statistically significance when age and sex is entered into the model predicting a relationship between physical activity social support and physical activity.
• This finding suggests that once age and sex are included in the model, physical activity social support is no longer a predictive factor for physical activity.

**Hypothesis 4**

• A multiple regression test revealed no statistically significant relationship between the individual physical activity social support scales (family, friends, and school) and physical activity.

• This suggests that the individual physical activity support scales (family, friends, and school social support) are not predictive factors of physical activity. Importantly, however, when analyzed individually, school physical activity social support is found to be a predictive factor for physical activity.

• These findings suggest that school social support influences middle and high school students’ physical activity behavior.

**Hypothesis 4a**

• A multiple regression test revealed no statistical significance when age and sex are included in the model predicting physical activity by the individual physical activity support scales.

• This finding suggests that age and gender do not have an influence in the relationship between the individual physical activity social support scales (family, friends, and school) and physical activity.

**Hypothesis 5**

• A binary logistic regression test revealed no statistical significance
• This finding suggests that no relationship is found between academic achievement and social support (physical activity and dietary behavior) regardless of whether physical activity and dietary behavior are present.

• This suggests that physical activity, dietary behavior, physical activity social support, and dietary behavior are not predictors of academic achievement.

Hypothesis 5a

• A binary logistic regression test revealed no statistical significance

• The finding suggests that age and sex do not influence the relationship between academic achievement and social support (physical activity and dietary).

Hypothesis 5b

• A binary logistic regression test revealed no statistical significance suggesting that neither social support variable (physical activity or dietary behavior) is a predictive factor for academic achievement.
CHAPTER V
DISCUSSION AND RECOMMENDATIONS

Purpose of the study
The purpose of this study was to analyze the impact of social support and selected demographics on physical activity, dietary behavior, and academic achievement among middle and high school students.

Introduction
In a recent study, Ogden, Carroll, Kit, and Flegal (2014) analyzed trends of overweight and obesity among children and youth in the U.S. This study revealed that there was no significant change between 2003-2004 and 2011-2012 in rates of overweight among the 2-19 year old population. This study also revealed a significant increase in obesity among women aged 60 or years or older (from 35.1% to 38.1%). Importantly, however, a significant decrease in obesity was revealed among 2 to 5 year old children (from 13.9% to 8.4%). Further, according to Ogden et al., trends in obesity prevalence specifically among middle and high school students have shown mixed results, indicating that further monitoring and research about this is needed among this population.

Health risks and consequences associated with overweight and obesity make reducing its prevalence a public health priority (USDHHS, 2010). A body of literature based on ecological models confirms that overweight and obesity are a result of not only individual characteristics, but also the environmental context in which an individual exists (Bronfenbrenner, 1979). This context can include a combined influence of
variables in the environment at home, at school, and in the community. Importantly, conflicting evidence exists regarding the role of social support for physical activity and dietary behavior on children and adolescents (Prochaska et al., 2002).

Governmental and non-governmental organizations have published numerous reports (CDC, 2010b, 2010c, 2011a; GENYOUth, 2013; Healthy Schools campaign and Trust for America’s Health, 2012; Institute of Medicine, 2007, 2013a; Mission: Readiness, 2010, 2012; USDHHS, 1996) and developed programs and initiatives including The Healthy People initiatives (USDHHS, 2013) and Let’s Move! Campaign (Let’s Move!, n.d.) to promote the health of young children and adolescents. These reports, policies, and initiatives have all come to similar conclusions. They support the importance of physical activity and healthy nutrition for school aged children. In addition, a robust body of literature confirms a consensus on the link between overall health, physical activity, and nutrition on academic achievement (Basch, 2010; Chomitz et al., 2009, Robert Wood Johnson Foundation and Trust for America’s Health, 2012).

The latest iteration of the Healthy People initiative (Healthy People 2020; USDHHS, 2013) includes an increased focus and emphasis on child and adolescent health than its earlier counterparts. Out of the 39 priority areas, 4 address goals specific to the health of middle and high school age youth. These include:

- Adolescent health
- Early and middle childhood
- Nutrition and weight status and physical activity (USDHHS, n.d.)
Further, specific objectives targeting schools are included in *Healthy People 2020*.

Among these objectives are:

- **NWS-2.** Increase the proportion of schools that offer nutritious foods and beverages outside of school meals
- **NWS-11.** (Developmental) Prevent inappropriate weight gain in youth and adults
- **NWS-15.** Increase the variety and contribution of vegetables to the diets of the population aged 2 years and older
- **NWS-17.** Reduce consumption of calories from solid fats and added sugars in the population aged 2 years and older
- **ECBP-2.** Increase the proportion of elementary, middle, and senior high schools that provide comprehensive school health education to prevent health problems in the following areas: unintentional injury; violence; suicide; tobacco use and addiction; alcohol or other drug use; unintended pregnancy, HIV/AIDS, and STD infection; unhealthy dietary patterns; and inadequate physical activity
- **AH 6.** Increase the proportion of schools with a school breakfast program
- **AH-5.** Increase educational achievement of adolescents and young adults

(USDHHS, n.d.)

The Healthy People agenda formalized the need for programs and policies to provide evidence-based data for setting the objectives. Further, the agenda documented the need for programs and policies were also needed to help achieve the national goals.
and objectives (Green & Fielding, 2011). Initiatives, including the Physical Education for Progress Act (PEP), The White House Taskforce on Childhood Obesity, and the Let’s Move! Campaign, and efforts coordinated by the Centers for Disease Control and the Institutes of Medicine, and other programs expand on these goals and objectives, provide recommendations on how to achieve the objectives set by the Healthy People agenda, and provide funding sources for programs focused at addressing these objectives.

According to the Physical Activity Guidelines for Americans (2008) and the Physical Activity Guidelines for Americans Midcourse Review Reports (USDHHS, 2012), physical activity is associated with positive health benefits. Further, Tomporowski et al. (2008) suggested that exercise can be used to enhance cognitive development and mental processing important in academics and other life behaviors in children. Similarly, nutrition and healthy dietary behavior has been shown to be important for the overall health of children, and importantly dietary behavior (Bradley & Greene, 2013) and physical activity (Basch, 2010) have been linked to academic achievement among school-age youth.

Some studies reveal that social support is another factor that may be associated with positive academic outcomes in children and adolescents (Mackinnon, 2012; Robbins et al., 2004). A substantial body of literature links social support, defined as an individual’s perception that he or she is cared for, esteemed and valued by people in his or her social network, that enhances personal functioning, assists in coping with stressors and may buffer him or her from adverse outcomes (Malecki & Demaray, 2002), and adolescent adjustment. For example, social support has been linked to academic
self-concepts (Wenz-Gross et al., 1997), adolescent adjustments and behavioral problems (Dunn et al., 1987), and depression (Cheng, 1997).

Sources of social support for children and adolescents come from parents, peers (Prochaska et al., 2002), siblings (Duncan et al., 2005), and school related personnel including teachers and coaches (Humbert et al., 2006). Schools expose children to nutrition and physical activity programs and policies. In addition, most schools provide some form of health education and physical education through the formal instructional curriculum and nutrition and nutrition education through the foods and beverages available to students before, during, and after school. Further, the social network that the school represents to students, including teachers, administrators, coaches, and peers, has an influential role to play in promoting student health (Khabialia et al., 2012).

The research regarding social support as it relates to student health, physical activity, and academic achievement is not as developed as the research regarding overweight and obesity and physical activity and nutrition. Specifically, there are few studies that investigate middle school students and social support. In the existing literature, there is conflicting evidence regarding the association of social support and physical activity (Prochaska et al., 2002). In this study, the role of social support as it relates to physical activity, dietary behavior, and academic achievement among middle and high school students was explored.

**Data Collection**

Middle and high school students enrolled in one Northeast Ohio school district were selected to participate in this study. The school district was selected as the target of
this research due to the administration, staff, and community efforts and dedication to improve the health of its students.

In order to get an initial sense of how well the newly compiled instrument would work in measuring what it intended to measure and its reliability, as well as to test the intended data collection process, especially when active parental approval was required, a pilot study was conducted in the fall of 2013. During the data analysis process, it was revealed that a number of subjects had chosen the *does not apply* option to a various number of social support questions for up to 100% of the questions. A tentative rule was used to deal with the *does not apply* case, that is, one is only allowed to have answered *does not apply* to a maximum of 50% of the questions. Once the rule was applied, all subscales reliability decreased slightly. The reliability of the two subscales in social support, the subscales related to dietary social support specifically, became low with the rule implemented; however, the overall scale had a high reliability coefficient. These findings generally supported the use of the tested instrument to measure the variables in the study. There is no apparent reason to change the instrument for formal data collection use. Further, the pilot study validated the process to acquire consent from both parents and students.

A submission of modification request with minor changes to the study protocol was submitted and approved by the Kent State University IRB (see Appendix F) in late December 2013. At that time, the schools were going into their winter recess; therefore the study was conducted in the beginning of the spring of 2014. In specific, the following steps were identified by the IRB:
• Active parental consent
• Active assent from those subjects 12 years and younger
• Active consent from subjects 13 years old and older
• Online instrument distribution using the Kent State University supported Qualtrics software, a software package provided to all Kent State University faculty and students for the purpose of online research collection.

On January 14th, parent informed consent forms were distributed to all enrolled middle and high school students. The forms were distributed by the first-period teachers to ensure that all students attending school that day received a parental consent form.

Teachers were instructed to keep a count of how many forms were distributed in each classroom. The researcher gave the school the forms in manila envelopes with an average of 25 forms per envelope. Twenty-five students is the average size of most classes in this district, according to the building principals. Each teacher then distributed the forms and collected them from students by the due date of January 24, 2014. One week following the distribution of the parent consent forms, a mass reminder was sent to all middle and high school parents via email asking parents to return the completed consent forms to the schools by the due date.

At the end of the school day on January 24th, the researcher collected parent consent forms from the building principals’ offices. The researcher then compiled two lists. One list consisted of those subjects who had been granted permission to participate in the study. A second list consisted of those subjects who had not been granted permission to participate in study.
On January 24th, the investigator collected consent forms from the principals’ offices. Due to a weak response, the deadline was extended until January 31st. During the week of January 31st, three snow days closed the school buildings. At the request of the high school principal, the deadline for consent collection was further extended until February 6th, 2014.

At the end of the consent collection period, out of the 943 students enrolled in the middle and high school in this district, 260 forms were returned for a 27.57% parental consent form return rate. Of the forms returned, 202 (77.69%) parents granted permission for the distribution of the instrument to their children and 58 (22.3%) parents declined participation. Of the 202 approved parental consent forms, 136 (67.5%) were for middle school students and 66 (32.7%) were for high school students. Of the 58 parents who declined participation, 41 (70.7%) were from the middle school and 17 (29.3%) were from the high school.

Once sufficient number of middle school subjects had been granted permission to participate, the instrument link was sent to all middle school students with parental permission to participate on January 31, 2014. Following the extensions, the link to the survey was distributed via a school-managed closed system email to all middle and high school subjects who had been granted parental permission to participate on February 10, 2014. The instrument-closing deadline was set for February 21, 2014. On February 17th and 18th, the school buildings were closed in acknowledgment of Presidents’ Day and a snow day respectively. On February 21st, the number of responses received was still too
low for use in a statistical analysis. A one-week extension was granted with a new
deadline of February 28, 2014.

After the final extension, of the 202 subjects who received the email with the link
to the instrument, 75 (37.13%) subjects attempted to take the instrument. Of the 75 who
attempted to take the instrument, 62 were found to be usable cases after initial analysis to
eliminate missing data. Of these, 34 (54.8%) identified themselves as middle school
students and 28 (45.2%) identified themselves as high school students. Further, 24
identified themselves as male, and 38 identified themselves as female.

Discussion

Research Question 1: Is there a relationship between Dietary Social Support and
Dietary Behavior when Physical Activity is considered?

H0: There is no statistically significant relationship between dietary social support
and dietary behavior when physical activity is considered.

H1: There was a statistically significant relationship between dietary social
support and dietary behavior when physical activity is considered.

Research Question 1a: If yes, will this relationship be influenced by age and
sex?

H0: The statistical significance of this relationship will not be influenced by age
and/or sex.

H1: The statistical significance of this relationship will be influenced by age
and/or sex.
A multiple regression was conducted to test research questions 1 and 1a. According to the overall regression model predicting dietary behavior by total dietary behavior when physical activity was considered, there was no statistical significance.

Among the subjects surveyed, the overall model statistical insignificance indicated that there was no relationship between total dietary social support and dietary behavior when physical activity was considered. When gender and age were included in the model there was still no statistical significance found.

This study found no relationship between total dietary social support and dietary behavior when physical activity was considered. Importantly, however, in the current literature social support has been shown to be associated with dietary health behaviors including fruit and vegetable consumption (Kubik et al., 2005) and adherence to change in diets (Wilson & Ampey-Thornhill, 2001). Further, Shaikh et al. (2008) described social support as a key influence on dietary intake.

Possible reasons for the difference in findings in this study as compared to the existing literature include the size of the subject pool, the inherent errors existing with any self-report survey, parent consent bias, and the social support scales problems with this age group. The active parent consent process may have influenced the small subject pool. Further, the numerous snow days may also have affected the number of parental consents returned to the school. There was some concern regarding self-report data. The extent to which students answered truthfully was an inherent error with self-report data.

Further, parental bias may have influenced which students were given permission to participate in the study. Importantly, in both the pilot study and the final study, the
family and friend dietary social support scales had to be adjusted due to missing data in the form of more than 50% of answers being does not apply by some individuals. Once statistically adjusted to eliminate the cases where more than 50% of the answers were does not apply, the reliability decreased for both the family and friend dietary social support scales. This may be due to a limited use of this scale with this age group.

**Research Question 2:** Is there a relationship between dietary family, friends, and/or school social support and dietary behavior?

*H0:* There is no statistically significant relationship between family, friends, and/or school social support and dietary behavior.

*H1:* There is a significant relationship between family, friends, and/or school social support and dietary behavior.

**Research Question 2a:** If yes, will this relationship be influenced by age and sex?

*H0:* The statistical significance of this relationship will not be influenced by age and/or sex.

*H1:* The statistical significance of this relationship will be influenced by age and/or sex.

A multiple regression was conducted to test research questions 2 and 2a. According to the overall regression model predicting dietary behavior by the individual dietary social support subscales (family, friends, and school), there was no statistical significance. Once age and gender were included in the model, there was a slight increase in R, indicating a tendency but not statistical significance. Among the subjects
surveyed, the overall model statistical insignificance indicated that there was no
relationship between the individual dietary social support variables and dietary behavior.
When gender and age were included in the model, there was still no statistical
significance found.

This study revealed that there was no relationship between the dietary social
support variables and dietary behavior. In the current literature, little is known regarding
adolescents’ perceived dietary behaviors as influenced or supported by the adults in their
lives including but not limited to parents (Stanton et al., 2007). Similarly to the current
study, Williams and Mummery (2012), “parental values,” defined as perceived
importance of healthy eating and physical activity by parents, and use of family rule
around food and watching television, was not associated with healthy eating behaviors.
Previous literature regarding dietary behavior and school’s influence, however, has
indicated that schools are not only a source of food and beverages for students during the
school day, but also they can indirectly influence social and cultural norms about food,
and specifically “healthy” food in the school environment (McNaughton, 2012).

Possible reasons for differences in findings in this study and previous research
regarding school dietary support and dietary behavior may be due to the size of the
subject pool and the inherent errors existing with any self-report survey. The active
parent consent collection process may have influenced the small subject pool. Further,
the numerous snow days also affected the number of days students were in school since
the winter break. Further, the extent to which students answered truthfully is an inherent
error with self-report data.
**Research Question 3:** Is there a relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered?

*H0:* There is no statistically significant relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered.

*H1:* There is a statistically significant relationship between Physical Activity Social Support and Physical Activity when Dietary Behavior is considered.

**Research Question 3a:** If yes, will this relationship be influenced by age and sex?

*H0:* The statistical significance of this relationship will not be influenced by age and/or sex.

*H1:* The statistical significance of this relationship will be influenced by age and sex.

A multiple regression was conducted to test research questions 3 and 3a. According to the regression model predicting physical activity by total physical activity social support when dietary behavior was considered, there was no statistical significance found. Even though the overall model was insignificant at last entry, it was significant when only total social support variable was in the model and when total social support and dietary behavior variable were included in the model. This suggests a positive relationship between physical activity and social support on physical activity. This relationship remains significant when dietary behavior was considered. However, this statistically significant relationship was greatly influenced by age and sex in that when age and sex were entered into the model, the overall model became insignificant.
This study found a positive relationship between physical activity and physical activity social support. This is supported by previous research by Duncan et al. (2005). Duncan et al. reported that social support was a major influence in physical activity for middle school students. There exists, however, conflicting evidence regarding the association of social support and physical activity in the current literature (Prochaska et al., 2002). According to Prochaska et al., these inconsistencies in findings are due to different measures of social support and of physical activity, specifically with the middle school population. Possible reasons for the insignificant findings of the overall model, once age and sex were included may be due to the size of the subject pool.

**Research Question 4:** Is there a relationship between Physical activity family, friends, and/or school social support and physical activity?

**H0:** There is no statistically significant relationship between family, friends, and/or school social support and physical activity.

**H1:** There is a statistically significant relationship between family, friends, and/or school social support and physical activity.

**Research Question 4a:** If yes, will this relationship be influenced by age and sex?

**H0:** The statistical significance of this relationship will not be influenced by age and/or sex.

**H1:** The statistical significance of this relationship will be influenced by age and/or sex.
A multiple regression was conducted to test research questions 4 and 4a. According to the overall regression model predicting physical activity by physical activity family social support, physical activity friend social support, and/or physical activity school social support, the model was not statistically significant. Although the model was found to be not significant, 15.3% of variance can be explained by physical activity behavior. When age and sex were included, the model became not statistically significant. Importantly of the three social support variables, only social support from school was found to be statistically significant. Overall, among these subjects, there was a positive predictive factor between physical activity social support and physical activity. When age and gender were included, the physical activity social support from school value became not statistically significant, suggesting an interaction between physical activity and age and gender.

Although no statistical significance of the overall model was found in this study, previous research suggests that during childhood and adolescence, peer influences are important and can have a significant impact on attitudes towards health behaviors including exercise (Stankov et al., 2012). Specifically, Hohepa et al. (2007), friend support was significantly associated with lunchtime physical activity for both junior and senior students. Parental support and school support were only significantly associated with lunch time physical activity for junior students. Interestingly, Hohepa et al. reported the opposite of the current study. Robbins et al. (2008) investigated gender and age differences in social support and their relationship with physical activity among middle school students. The authors found that students identified parents, coaches/gym
teachers, and peers as the most important support persons in regards to physical activity. These findings support the current study’s findings that school social support is a predictor of physical activity behavior. Other studies have found a significant relationship between family social support and physical activity (McGuire et al., 2002). Previous studies have also found contrasting significant differences between social support and physical activity between boys and girls. McGuire et al. found that boys had a stronger parental influence than females, whereas Davison et al. (2003) found that girls are more likely to participate in physical activity if at least one parent is supportive. Further, Duncan et al. reported that as students age, there is a decrease in perception of parent and sibling support and that in general those middle school students who perceive their support from peers tend to have higher levels of physical activity.

While in the current study only school social support was found to be significant, Hohepa et al. (2007) found that social support from all sources, including parents, peers, schools—with the exception of school support and senior students—were associated with participation in after-school physical activity. Possible reasons for the difference in findings in this study as compared to the current literature include the size of the subject pool, the inherent errors existing with any self-report survey, and parent consent bias.

**Research Question 5:** Is there a relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered?
H0: There is no statistically significant relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered.

H1: There is a statistically significant relationship between Social Support (Physical Activity and Dietary Behavior) and Academic Achievement when Physical Activity and Dietary Behavior are considered.

Research Question 5a: If yes, will this relationship be influenced by age and sex?

H0: The statistical significance of this relationship will not be influenced by age and/or sex.

H1: The statistical significance of this relationship will be influenced by age and/or sex.

Research Question 5b: If yes, are both social support variables (Physical Activity and/or Dietary Behavior) significant?

H0: Neither social support variable will be significant in predicting academic achievement.

H1: At least one social support variable will be significant in predicting academic achievement.

A binary logistic regression analysis was conducted to predict the odds of a subject to get an A versus a B grade when compared by social support, academic achievement, and physical activity and dietary behavior. The overall model was found not significant. The overall model statistical insignificance indicates that there was no relationship between social support (physical activity and dietary behavior) and academic
achievement when physical activity and dietary behavior are considered. When gender and age were included in the model, there was still no statistical significance.

While the current study found that the social support variables, and physical activity and dietary behaviors were not significant predictors of academic achievement, previous studies (Goodenow, 1993; Mackinnon, 2012; Robbins et al., 2004; Wentzel, 1998) found a positive relationship between social support and academic achievement. Specifically, Wentzel (1998) and Goodenow (1993) found that early adolescents who perceive their parents, peers, and teachers to be supportive perform better academically.

Possible reasons for differences in findings between the current study and previous research may include size of the subject pool, the inherent errors existing with any self-report survey, parent consent bias, the social support scales problems with this age group, and online data collection process.

**Implications for Application and Practice**

In the current study, the participating school district was chosen due to its unique commitment to support a healthy environment for students, teachers, staff, parents, and the community. In this context, the district provides a supportive environment and opportunities for physical activity and healthy nutrition including healthy lunches and opportunities to participate in physical activity throughout the school day. Further, financial support from a community advocate has made it possible to provide students and staff with access to new, state of the art physical activity facilities.

According to the findings of the current study, social support from school regarding physical activity was the statistically significant variable in predicting physical
activity. This means that providing an environment that is supportive and promoting of physical activity can have an impact on individual student health. A supportive environment for physical activity may not only be limited to providing physical education classes, but also incorporating cross-curricular physical activity, providing opportunities for before and after school physical activity, as well as supporting student athletic involvement (inter and intra mural sports). The findings regarding physical activity social support from school and total physical activity social support and physical activity behavior can have significant practical applications. If as the findings suggest, students are more physically active when their school provides opportunities for physical activity and encourages students to be physically active, schools have a significant role to play in student health. A growing body of literature shows that students with generally higher levels of physical activity tend to have better overall health and higher academic achievement (Castelli et al., 2007; Chomitz et al., 2009; Dwyer et al., 2001; Eveland-Sayers et al., 2009; Grissom, 2005). This suggests that by creating an environment in which students feel supported and encouraged to be active can have an impact on the school’s overarching goals of academic achievement. This makes social support for physical activity a key tool for schools in order help their students achieve their best academic outcomes.

**Implications for Future Research**

This study explored an age group for which very little is known due to the limited accessibility to this population. For this reason, there are many implications for future research:
• Further studies can continue to explore the relationship between social support, physical activity, dietary behavior, and academic achievement. Due to the small size of the subject pool, it was not possible to establish a strong statistical link between the variables; however, there was a tendency shown for many of the research questions. This implies that a further study, with an increased population pool, may be more successful in demonstrating these relationships.

• As the influence of technology increases in society, it is important to find new and more effective ways to incorporate it into research. This includes finding more effective ways to attain parental consent as well as to deliver the instrument to the subject pool. Further research is needed to develop more effective ways to reach this increasingly technologically inclined population.

• Very little is known specifically about the middle school population. For this reason, the available instruments to measure social support are not currently specifically tailored to this population. Further studies are needed to develop population specific instruments to appropriately measure social support among young adolescents.

In conclusion, reports by governmental and non-governmental organizations concluded that supporting physical activity and healthy nutrition for school aged children is important. Although the current study did not find a significant relationship between the variables studied, there is some consensus in the literature regarding the link between overall health, physical activity, and nutrition on academic achievement. The role of
social support on these variables is still a growing literature and one that still needs to be explored.

**Limitations**

As with all studies, this study has several limitations. Possible limitations include a small subject pool, self-report data, active parental consent process, parent consent bias, numerous snow days during parental consent and survey administration period, online data collection, and limited previous use of the social support scales with this specific age group.

One limitation of the study was the small subject pool size. A small subject pool size resulted in a limited number of respondents. The limited number of responses may have resulted in an inadequate representation of the overall population of middle and high school students enrolled in the school district.

Another limitation was the instrument’s reliability on self-reporting. As with any self-report data, there is an inherent limitation due to inability to assure that subjects are responding truthfully and with appropriate recall of the information asked. In this study, the subjects were middle and high school students, and were asked to recall events of the past week or even 12 months. The reliability and accuracy of those answers can be debated.

Another possible limitation to the study was the active parental consent process. Due to the age of the participants, active consent from parents was required before distribution of the instrument. This procedure is meant to protect this vulnerable population. Importantly, however, it may decrease response rates due to many factors.
Such factors include but are not limited to students not bringing consent forms home, not showing it to parents, parents forgetting to return consents by due dates, and students forgetting to return consent forms to the school. Further, the school district has a history of conducting surveys using a passive consent process, where parents need only return the signed paper if they do not wish their child to participate. This may have created some confusion for the parents, thinking that they did not need to return the forms if they agreed to have their child participate in the study.

Parent consent bias may have also been a limitation to the study. It is possible that parents who perceived themselves to not provide adequate social support for their children did not allow their students to participate. Further, a parent that is not actively involved in the child’s life may be less likely to see the paper, and respond to the school regarding participation in the study.

An unexpected limitation was the numerous snow days that occurred during the parental consent and survey administration period. During the parental consent and survey collection periods, an unusually high number of snow days occurred. This high number of snow days meant that students did not have a full week of school until the end of February, corresponding to the end of survey collection. Not being in school on consecutive days may have influenced the students’ ability to remember and to return consent forms. Further, when not in schools students were not reminded to check their emails for the link to the survey, possibly resulting in a lower response rate than expected.
Online data collection may have been a limitation to this study. The influence of technology on research has yet to be determined, specifically with this age group. Using email links to the online survey may have been a limitation because although all students have a school-provided email, it is not possible to know how many students use it daily or as their primary email. For this reason, it is difficult to determine if all students received the link and reminder emails in a timely manner in order to complete the study.

Finally, the limited amount of studies conducted specifically with the middle school population may have been a limitation of the study regarding the social support scales. Little is known about this population in general, specifically using social support scales. The scales had been previously used and determined reliable; however the use of the scales with this age population is limited and warrants further exploration.
APPENDICES
APPENDIX A

SCHOOL LETTER OF SUPPORT
Appendix A

School Letter of Support

December 16, 2013

To Whom It May Concern:

The [Study School District] has been in communication with Ms. Manuella Crawley regarding her doctoral study titled, "An analysis of the impact of social support and selected demographics on physical activity, dietary behavior and academic achievement among middle and high school students." [Study School District] is supportive and interested in participating within her study. Ms. Crawley has clearly described the study and level of engagement of our students and staff. This will be positive professional experience for our teachers and students. In addition, we look forward to better understanding our programming and work through this study. Please do not hesitate to give me a call if you have further questions.

Superintendent
[Study School District]
APPENDIX B

INSTRUMENT
Appendix B

Instrument

This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to improve health education for young people like yourself. The answers you give will be kept private. No one will know what you answer.

The next 5 questions ask about physical activity.

1. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
   A. 0 days  
   B. 1 day  
   C. 2 days  
   D. 3 days  
   E. 4 days  
   F. 5 days  
   G. 6 days  
   H. 7 days

2. On an average school day, how many hours do you watch TV?
   A. I do not watch TV on an average school day  
   B. Less than 1 hour per day  
   C. 1 hour per day  
   D. 2 hours per day  
   E. 3 hours per day  
   F. 4 hours per day  
   G. 5 or more hours per day

3. On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Count time spent on things such as Xbox, PlayStation, an iPod, an iPad or other tablet, a smartphone, YouTube, Facebook or other social networking tools, and the Internet.)
   A. I do not play video or computer games or use a computer for something that is not school work  
   B. Less than 1 hour per day  
   C. 1 hour per day  
   D. 2 hours per day  
   E. 3 hours per day  
   F. 4 hours per day  
   G. 5 or more hours per day

4. In an average week when you are in school, on how many days do you go to physical education (PE) classes?
   A. 0 days  
   B. 1 day  
   C. 2 days  
   D. 3 days  
   E. 4 days  
   F. 5 days

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5. During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)
   A. 0 teams
   B. 1 team
   C. 2 teams
   D. 3 or more teams

The next 9 questions ask about food you ate or drank during the past 7 days. Think about all the meals and snacks you had from the time you got up until you went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

6. During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)
   A. I did not drink 100% fruit juice during the past 7 days
   B. 1 to 3 times during the past 7 days
   C. 4 to 6 times during the past 7 days
   D. 1 time per day
   E. 2 times per day
   F. 3 times per day
   G. 4 or more times per day

7. During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)
   A. I did not eat fruit during the past 7 days
   B. 1 to 3 times during the past 7 days
   C. 4 to 6 times during the past 7 days
   D. 1 time per day
   E. 2 times per day
   F. 3 times per day
   G. 4 or more times per day

8. During the past 7 days, how many times did you eat green salad?
   A. I did not eat green salad during the past 7 days
   B. 1 to 3 times during the past 7 days
   C. 4 to 6 times during the past 7 days
   D. 1 time per day
   E. 2 times per day
   F. 3 times per day
   G. 4 or more times per day

9. During the past 7 days, how many times did you eat potatoes? (Do not count french fries, fried potatoes, or potato chips.)
   A. I did not eat potatoes during the past 7 days
   B. 1 to 3 times during the past 7 days
   C. 4 to 6 times during the past 7 days
   D. 1 time per day
   E. 2 times per day
   F. 3 times per day
   G. 4 or more times per day
10. During the past 7 days, how many times did you eat carrots?
A. 1 did not eat carrots during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

11. During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)
A. 1 did not eat other vegetables during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

12. During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)
A. 1 did not drink soda or pop during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

13. During the past 7 days, how many glasses of milk did you drink? (Count the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)
A. 1 did not drink milk during the past 7 days
B. 1 to 3 glasses during the past 7 days
C. 4 to 6 glasses during the past 7 days
D. 1 glass per day
E. 2 glasses per day
F. 3 glasses per day
G. 4 or more glasses per day

14. During the past 7 days, on how many days did you eat breakfast?
A. 0 days
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days
G. 6 days
H. 7 days
15. Below is a list of things people might do or say to someone who is trying to exercise regularly. If you are not trying to exercise, then some of the questions may not apply to you, but please read and give an answer to every question.

<table>
<thead>
<tr>
<th>None</th>
<th>Rarely</th>
<th>A few times</th>
<th>Often</th>
<th>Very often</th>
<th>Does not apply</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>0</td>
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</table>

During the past three months, my family (or members of my household):

1. Exercised with me.
2. Offered to exercise with me.
3. Gave me helpful reminders to exercise ("Are you going to exercise tonight?").
4. Gave me encouragement, to stick with my exercise program.
5. Changed their schedule so we could exercise together.
6. Discussed exercise with me.
7. Complained about the time I spend exercising.
8. Criticized me or made fun of me for exercising.
9. Gave me rewards for exercising (bought me something or gave me something I like).
10. Planned for exercise on recreational outings.
11. Helped plan activities around my exercise.
12. Asked me for ideas on how they can get more exercise.
13. Talked about how much they like to exercise.

During the past three months, my friends:

1. Exercised with me.
2. Offered to exercise with me.
3. Gave me helpful reminders to exercise ("Are you going to exercise tonight?").
4. Gave me encouragement, to stick with my exercise program.
5. Changed their schedule so we could exercise together.
6. Discussed exercise with me.
7. Complained about the time I spend exercising.
8. Criticized me or made fun of me for exercising.
9. Gave me rewards for exercising (bought me something or gave me something I like).
10. Planned for exercise on recreational outings.
11. Helped plan activities around my exercise.
12. Asked me for ideas on how they can get more exercise.
13. Talked about how much they like to exercise.
16. Below is a list of things people might do or say to someone who is trying to improve their eating habits. We are interested in high fat and high salt (or high sodium) foods. If you are not trying to make any of these dietary changes, then some of the questions may not apply to you, but please read and give an answer to every question.

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>Rarely</th>
<th>a few times</th>
<th>often</th>
<th>very often</th>
<th>does not apply</th>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>0</td>
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</tbody>
</table>

During the past three months, my family (or members of my household):

1. Encouraged me not to eat "unhealthy foods" (cake, salted chips) when I'm tempted to do so.
2. Discussed my eating habit changes with me (asked me how I'm doing with my eating changes).
3. Reminded me not to eat high fat, high salt foods.
4. Complimented me on changing my eating habits ("Keep it up", "We are proud of you").
5. Commented if I went back to my old eating habits.
6. Ate high fat or high salt foods in front of me.
7. Refused to eat the same foods I eat.
8. Brought home foods I'm trying not to eat.
9. Got angry when I encouraged them to eat low salt, low fat foods.
10. Offered me food I'm trying not to eat.

During the past three months, my friends:

1. Encouraged me not to eat "unhealthy foods" (cake, salted chips) when I'm tempted to do so.
2. Discussed my eating habit changes with me (asked me how I'm doing with my eating changes).
3. Reminded me not to eat high fat, high salt foods.
4. Complimented me on changing my eating habits ("Keep it up", "We are proud of you").
5. Commented if I went back to my old eating habits.
6. Ate high fat or high salt foods in front of me.
7. Refused to eat the same foods I eat.
8. Brought home foods I'm trying not to eat.
9. Got angry when I encouraged them to eat low salt, low fat foods.
10. Offered me food I'm trying not to eat.
17. How much does your school encourage you to eat healthy food?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>Some</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</table>

18. How much does your school encourage you to be physically active?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>Some</th>
<th>Very Much</th>
</tr>
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<td></td>
<td>1</td>
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<td>4</td>
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</table>

19. During the past 12 months, how would you describe your grades in school?
A. Mostly A's
B. Mostly B's
C. Mostly C's
D. Mostly D's
E. Mostly F's
F. None of these grades
G. Not sure

20. How old are you?
A. 10 years old or younger
B. 11 years old
C. 12 years old
D. 13 years old
E. 14 years old
F. 15 years old
G. 16 years old
H. 17 years old
I. 18 years old or older

21. What is your sex?
A. Female
B. Male

22. Are you:
A. A high school student
B. A middle school student
APPENDIX C

INSTRUMENT PERMISSIONS
Appendix C

Instrument Permissions

-----BEGIN PGP SIGNED MESSAGE-----

Manuela Crawley <mcrawle3@kent.edu>

Request to use your social support scale in dissertation study and question
2 messages

Manuela Crawley <mcrawle3@kent.edu> Thu, Mar 7, 2013 at 4:00 PM
To: jsallia@ucsd.edu

Dr. Sallis,

My name is Manuela Crawley. I am a Doctoral Student at Kent State University. I am in the process of developing my instrument for my dissertation research and I was hoping you might be able to help me. First, I would like to request your permission to use your scales of social support family and friends for physical activity and dietary behaviors.

Secondly, in my study I am trying to determine the influence of social support on physical activity, dietary behavior and academic achievement. Beyond family and friend social support, I need to also measure "school social support" as it relates to physical activity and dietary behavior I have not able to find any instruments that might be helpful in measuring this variable. I am aware of the connectedness scales, but they are not specific to physical activity or dietary behavior. What I am looking for is a scale similar to the ones you have developed for family and friends, but for school. Are you aware of any such scale? Knowing that you are an expert in this area, I thought that if anyone would be able to point me in the right direction it would be you.

I thank you for your help in advance,
Sincerely,
Manuela

-----
Manuela Crawley
Health Education and Health Promotion
Kent State University, Kent, OH
mcrawle3@kent.edu

-----

Saillia, Jim <jsallia@ucsd.edu> Sat, Mar 9, 2013 at 3:18 PM
To: Manuela Crawley <mcrawle3@kent.edu>

Manuela,

Thanks for your interest in our scales. Yes, you have permission to use the social support scales.

I don't know of any school support scales that you describe. Sorry.

-----BEGIN PGP SIGNED MESSAGE-----
Kent State University. Mail - Request to see your social support...

Jimi Sallis, Ph.D.
Distinguished Professor of Family and Preventive Medicine
Chief, Division of Behavioral Medicine
University of California, San Diego, mail code 0524
Director, Active Living Research
3900 Fifth Avenue, Suite 310
San Diego, CA 92103
Phone: 619-260-9500; fax 619-260-9510
Email: sallis@ucsd.edu; Website: http://sallis.ucsd.edu
I can't keep up! I don't assume I will read your email.
www.activelivingresearch.org

From: Minouche Dansky [mailto:minouche@kent.edu]
Sent: Thursday, March 07, 2013 1:01 PM
To: Sallis, Jim
Subject: Request to use your social support scale in dissertation study and question

[Content text here]
Request for Using a question from you survey in my dissertation

To: dr. clark@auckland.ac.nz

Wed, Mar 20, 2013 at 2:59 PM

Dr. Clark,

My name is Manuela Crawley. I am a doctoral student in Health Education and Health Promotion at Kent State University in Kent, OH, USA. I am in the process of creating an instrument for my doctoral dissertation. For my study I will be analyzing the impact of Social support from family, friends and schools and selected demographics on physical activity, dietary behaviors and academic achievement among middle and high school students. I have been trying to find a scale to measure social support in schools related to physical activity and dietary behavior and so far I had been unsuccessful. Recently, however, I ran into an article that described your youth2012 survey. In it, I noticed a question set that asked: "How much does your school encourage physical activity and healthy eating (p. 62 in your survey questionnaire)?" I was hoping that I would receive your permission to use this question set in my research instrument to help determine the school social support variable.

Further, I have been trying to locate the methodology and validity information for your questionnaire to include in my dissertation document. I am give permission to use this question. Where might I be able to find this information?

Thank you in advance for your consideration of my request.

Sincerely,

Manuela

Manuela Crawley
Health Education and Health Promotion
Kent State University, Kent, OH
mcrawley@kent.edu

Wed, Mar 20, 2013 at 3:04 PM

To: smason@auburn.ac.nz

Dr. Mason, I sent the email below to Dr. Clark and received an out of office reply, therefore I am forwarding my request to you.

Sincerely,

Manuela

[Out of office reply]

Sarah Mason <s.mason@auburn.ac.nz>

Wed, Mar 20, 2013 at 3:13 PM

To: Manuela Crawley <mcrawley@kent.edu>

Hello Manuela
I am just making a few enquiries for you and will get back to you as soon as I have some answers.

Kind regards

Sarah

---

From: Manuele Cawley <mcawley@kent.edu>
Sent: Thursday, 21 March 2013 8:04 am.
To: Sarah Mason
Subject: Re: Request for listing a question from you survey in my dissertation

(Sender name redacted)

Manuele Cawley <mcawley@kent.edu>
To: Sarah Mason <smason@uakland.ac.nz>

Thu, Mar 21, 2013 at 8:45 AM

Thank you for your help. I look forward to hearing from you.

Sincerely,

Manuele

(Sender name redacted)

---

Sarah Mason <smason@uakland.ac.nz>
To: Manuele Cawley <mcawley@kent.edu>

Thu, Mar 21, 2013 at 9:07 PM

Hello Manuele

I meant to say you are welcome to use the question. I am just checking out for you as to what validity, if any, we have for that question. I will come back as soon as I hear from the relevant researcher.

Cheers

Sarah
APPENDIX D

PILOT STUDY IRB
Appendix D

Pilot Study IRB

IRB LOG NUMBER_______________________

KENT STATE

Use of Human Subjects in Research Application
(LEVEL II or LEVEL III projects)

IMPORTANT: Please be sure to indicate an answer to all of the questions on this form. Submission of incomplete forms or failure to include all of the needed attachments will most likely result in delays for IRB review/approval. Handwritten forms are not accepted.

INSTRUCTIONS for INVESTIGATORS:
1. Submit this completed document with any needed attachments via email attachment to an IRB discipline specific reviewer.

To submit the form with a typed signature, the form must be submitted from the Investigator's @kent.edu email account. If completed form is signed and then scanned as a PDF attachment, the @kent.edu email requirement does not apply.

2. Do NOT begin data collection prior to receiving notification from the KSU IRB that the study has received final approval.

To complete this form: Single left-click to complete text fields. To check a box, double left-click on the box, then click "checked". Click OK.

Title of Study: An Analysis of the impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement Among Middle and High School Students

Section 1 – INVESTIGATOR INFORMATION

<table>
<thead>
<tr>
<th>Last Name</th>
<th>Kele</th>
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<tbody>
<tr>
<td><a href="mailto:ding@kent.edu">ding@kent.edu</a></td>
<td>330-672-0688</td>
</tr>
</tbody>
</table>

School of health sciences

Status: ( ) Faculty ( ) Doctoral Student ( ) Graduate Student ( ) Undergraduate Student ( ) Staff

Project: ( ) Faculty Research ( ) Student Thesis/Dissertation ( ) Course Requirement ( ) Other: Specify: ______________________

a. Are there any Kent State University affiliated co-investigators or key personnel on this protocol?

"Key personnel" are defined as individuals who participate in the design, conduct, or reporting of human subjects research. At a minimum, include individuals, who recruit participants, obtain consent or, who collect study data.

☐ Yes ☐ No

Appendix A
b. Are there any external (non-Kent State University affiliated) co-investigators or key personnel engaged in the research?

"Engaged" individuals are those who intervene or interact with participants in the context of the research or who will obtain individually identifiable private information for research funded, supervised, or coordinated by Kent State University. See Engagement Guidance or contact ORC for more information.

☐ Yes  Yes Complete Appendix B  ☑ No

No

Appendix B

c. Has the Principal Investigator (PI) completed the required web-based course years (CITI, or equivalent) in the protection of human research subjects?

Educational requirements (initial and continuing) should be satisfied prior to submitting the application for IRB review. See Human Subjects Protection Training policy for more information. Final approval from the IRB will not be obtained until all requirements are fulfilled.

☐ Yes  Yes Attach Copy of completion certificate  ☑ No

No

Section 2 – FUNDING INFORMATION

a. Does this research have external funding or have you requested external funding for this research?

☐ Yes  ☑ No

If Yes → Specify sponsor: ____________________________

Protocol/Proposal #: ____________________________

Institution (if not KSU): ____________________________

Have all Kent State University investigators and key personnel completed the required COI disclosure for externally funded research for the purposes of this research project?

☐ Yes  ☑ No

b. Is any support other than monetary (e.g., drugs, equipment, supplies, etc.) being provided for the study?

☐ Yes  ☑ No

If Yes → Specify support and provider: ____________________________

Attach a copy of the grant application or funding proposal.

The university is required to verify that all funding proposals and grants (new or renewals) have been reviewed by the IRB before funds are awarded. If the research funded by a federal agency and involves a subcontract to or from another entity, an IRB Authorization Agreement may be required. Contact the Office of Research Compliance (ORC) for more information.

c. Does the PI for this research or their immediate family members (i.e., spouse, domestic partner, or dependent children) have a financial interest that would reasonably be affected by the research, or a financial interest in any entity whose financial interest would reasonably appear to be affected by the research?

Financial interests include (but are not limited to) salary or other payments for services (e.g., consulting fees or honoraria), equity interests (e.g., stocks, stock options, or other ownership interests), and intellectual property rights (e.g., patents, copyrights, and royalties from such rights).

☐ Yes  Yes Complete Appendix 2  ☑ No

No

Appendix 2
d. Does the PI for this research or their immediate family members (i.e., spouse, domestic partner, or dependent children) have a non-financial Conflict of Interest that would reasonably be affected by the research. 

A non-financial conflict of interest is an interest, other than monetary, of an individual (or his/her immediate family) in the design, conduct, or reporting of the research or other interest that competes with the obligation to protect research participants and potentially compromises the objectivity and credibility of the research process.

Section 3 – RESEARCH DESIGN

a. Will any members of the research team be conducting or coordinating study activities at a site other than Kent State University? 

Research to be conducted at locations other than Kent State University may require a letter of support, another institution’s approval if personnel are engaged or, the execution of an IRB Authorization Agreement. See IRB Authorization Agreement in contact OIRC for more information.

b. Is any of this research being conducted outside of the U.S.A?

c. What are the estimated beginning and end dates of the project? August 2013 to September 2013

d. Briefly summarize the purpose of the proposed research using non-technical language that can be readily understood by someone outside the discipline. Use complete sentences (limit 300 words).

The purpose of this study will be to investigate the impact of social support and selected demographics on physical activity, dietary behavior, and academic achievement among middle and high school students. This is a pilot study. The purpose is to determine validity and reliability of the instrument and process for the future full scale study.

e. List the scientific or scholarly aims of the research study

1) Are Social Support and Physical Activity (both) significant predictors of Dietary Behavior after controlling for Age, Sex and Student Status?
2) Are Social Support and Dietary Behavior (both) significant predictors of Physical Activity after controlling for Age, Sex and Student Status?
3) Are Physical Activity, Dietary Behavior, and Social Support significant predictors of Academic Achievement after controlling for Age, Sex and Student Status?
4) Will the above results change when the Social Support variable is replaced by three Social Support Subscale variables? In other words, which type or source of social support is/are significant predictor(s) in the above three statistical models?

f. Summarize existing knowledge and previous work that support the expectation of obtaining useful results without undue risk to human subjects. Use complete sentences (limit 300 words).

Overweight and obesity has been shown to be related to lifestyle habits. Such lifestyle habits as physical activity and healthy dietary behaviors are shown to lower the risk in children and adults of becoming obese and developing related chronic diseases (Office of the Surgeon General, 2010). In recent decades obesity quickly has become a worldwide epidemic. The World Health Organization reports that overweight and obesity is are
the fifth leading cause of global deaths (www.who.org). According to Raphael (1998), schools can play an important role in the health of children and can be an effective setting for interventions. According to Basch’s (2010) “healthier students make better learners” a clear link has been established between physical health and physical activity and the academic achievement, making the health of students an important and relevant issue for schools. Social support is an integral part and function of something even more complex: social networks. Social networks are the relationships that surround individuals and the links between people that may or may not provide support. Social networks provide specific functions, such as social influence, social control, social undermining, social comparison, companionship and social support (Glanz, 2008). With this in mind the purpose of this study is to analyze the impact of the students’ perception of social support from three sources (family friends and school) on individual physical activity, dietary behavior and academic achievement.

---

g. Identify and describe (in order of occurrence, if applicable) all interventions and interactions that are to be performed solely for the research study. Attach a copy of materials to be used (e.g., interview/focus group questions, instruments, data collection forms, etc.).

The intervention is a one-time online survey of students. The survey investigates students’ perceptions regarding their physical activity and dietary behaviors, as well as perceptions of social support from family, friends and school and academic achievement. It is a cross-sectional survey study.
h. Check all research activities that apply. Attach a copy of materials to be used (e.g., interview/focus group questions, instruments, data collection forms, etc.).

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesia (general or local) or sedation</td>
<td>Magnetic Resonance Imaging (MRI)</td>
</tr>
<tr>
<td>Audio, video, digital, or image recordings</td>
<td>Materials that may be considered sensitive, offensive, threatening, or degrading</td>
</tr>
<tr>
<td>Biohazards (e.g., rDNA, infectious agents, select agents, toxins)</td>
<td>Non-invasive medical procedures (e.g., EKG, Doppler)</td>
</tr>
<tr>
<td>Biological sampling (other than blood)</td>
<td>Observation of participants (including field notes)</td>
</tr>
<tr>
<td>Blood drawing, injections, surgical procedures (including biopsies)</td>
<td>Oral history (does not include medical history)</td>
</tr>
<tr>
<td>Coordinating Center</td>
<td>Placebo</td>
</tr>
<tr>
<td>Data, not publicly available</td>
<td>Pregnancy testing</td>
</tr>
<tr>
<td>Data, publicly available</td>
<td>Radiation (e.g., CT or DEXA scans, X-rays, nuclear medicine procedures)</td>
</tr>
<tr>
<td>Data/Specimen storage/repository</td>
<td>Complete Appendix V (Record review which may include PHI)</td>
</tr>
<tr>
<td>Deception</td>
<td>Specimen research</td>
</tr>
<tr>
<td>Devices</td>
<td>Stem cell research</td>
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<tr>
<td>Diet, exercise, or sleep modifications</td>
<td>Surveys, questionnaires, or interviews (one-on-one)</td>
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<tr>
<td>Drugs or biologics</td>
<td>Other: Specify:</td>
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<tr>
<td>Emergency research</td>
<td></td>
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<tr>
<td>Focus groups</td>
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<tr>
<td>Food supplements</td>
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<td>Gene transfer</td>
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<tr>
<td>Genetic testing</td>
<td></td>
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<tr>
<td>Internet or e-mail data collection</td>
<td></td>
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</tbody>
</table>

i. Estimate the time required from each participant, including individual interactions, total time commitment, and long-term follow-up, if any.

It should not take students any more than 20 minutes to complete the questionnaire.
Section 4 - PARTICIPANT POPULATION

a. What is the total number of participants (or number of participant records, specimens, etc.) for whom you are seeking Kent State IRB approval:

The number of participants is defined as the number of individuals who agree to participate (i.e., those who provide consent or whose records are accessed, etc.) even if all do not prove eligible or complete the study. The total number of research participants may be increased only with prior IRB approval.

30 students (15 middle school students and 15 high school students)

b. Explain how this number was derived (e.g., statistical rationale, attrition rate, etc.).

As a pilot study, 5 to 15 subjects per group are appropriate to maintain a reasonable accuracy of parameter estimation based on 95% confidence interval and statistics power. However, for this pilot study, the purpose is not only the parameter estimation but validating the instrument and data collection process. Therefore, thirty students for this pilot study are needed.

c. Specify the age(s) of the individuals who may participate in the research:

Age(s): 9-17 years of age

d. Specify the participant population(s) to be included (check all that apply):

- Adults
- Adults with decisional impairment ➔ Complete Appendix W
- Children (< 18 years) ➔ Complete Appendix I
- Neonates (uncertain viability/nonviable) ➔ Complete Appendix K
- Non-English speaking ➔ Complete Appendix J
- Pregnant women/fetuses ➔ Complete Appendix M

(Only if pregnant women are intentionally recruited and/or studied)

- Prisoners ➔ Complete Appendix L
- Student research pools (e.g., psychology, sociology, communication)
  Specify: 
- Unknown (e.g., research using secondary data/specimens, non-targeted surveys)
  Specify: 
- Other
  Specify: 

The regulations require that, “When some or all of the subjects are likely to be vulnerable to coercion or undue influence, such as children, prisoners, pregnant women, mentally disabled persons, or economically or educationally disadvantaged persons, additional safeguards have been included in the study to protect the rights and welfare of these subjects.” 45 CFR 46.111(b). There are additional, explicit regulatory requirements regarding pregnant women and fetuses (45 CFR 46 Subpart B), prisoners (45 CFR 46 Subpart C) and children (45 CFR 46 Subpart D and 21 CFR 50 Subpart D). The questions in the applicable appendices address these additional requirements.

e. Describe the characteristics of the proposed participants, and explain how the nature of the research requires/justifies their inclusion.

Participants will be middle and high school students. This is the target population of the study, as I would like to investigate the impact of social support on their physical activity, dietary behavior and academic achievement. There is very little information available in the literature regarding specifically middle school students. For this reason it is important to explore this age group and their perceptions regarding important health behaviors and variables that might influence those behaviors. Further, high school students are also included to investigate a possible progression as students grow older and to determine if age is a factor in the above-described perceptions.
f. Will any participants be excluded based on age, gender, race/ethnicity, pregnancy status, language, education, or financial status?  
☐ Yes  ☒ No

If Yes ➔ Explain the criteria and reason(s) for each exclusion. Consider the study’s scientific or scholarly aims and risks.

... (content omitted for brevity)

... (content omitted for brevity)

... (content omitted for brevity)

... (content omitted for brevity)

... (content omitted for brevity)

... (content omitted for brevity)

Section 5 - RISK/BENEFIT ASSESSMENT

a. Do you think that the probability and magnitude of harm or discomfort anticipated for the participants are greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests?  
☐ Yes  ☒ No

If Yes ➔ Describe the plan to oversee and monitor data collected to ensure participant safety and data integrity. Include the following:

• The information that will be evaluated (e.g., incidence and severity of actual harm compared to that expected);
• Who will perform the monitoring (e.g., investigator, sponsor, or independent monitoring committee);
• Timing of monitoring (e.g., at specific points in time, after a specific number of participants have been enrolled); and
• Decisions to be made as a result of the monitoring process (e.g., provisions to stop the study early for unanticipated problems).

... (content omitted for brevity)

b. Describe all reasonably expected risks, harms, and/or discomforts that may apply to the research. Discuss severity and likelihood of occurrence. As applicable, include potential risks to an embryo or fetus if a woman is or may become pregnant. Consider the range of risks, including physical, psychological, social, legal, and economic.

There are no foreseeable risks involved in this research as students have the choice of not completing the questionnaire.
c. Describe how risks, harms, and/or discomforts will be minimized. If testing will be performed to identify individuals who may be at increased risk (e.g., pregnant women, individuals with HIV/AIDS, depressive disorders, etc.), address timing and method of testing; include how positive test results will be handled.

To minimize discomfort, anonymity will be provided by the electronic survey.

d. List the potential benefits that individual participants, society or both may expect as a result of this research study. State if there are no direct benefits to individual participants. Compensation is not to be considered a benefit.

There are no direct benefits to the individual participants

e. Discuss how risks to participants are reasonable when compared to the anticipated benefits to participants (if any) and the importance of the knowledge that may reasonably be expected to result.

There is no risk and no direct benefits to these participants, however the results can contribute to the literature and provide insight into adolescent perceptions and behaviors and their links to academic achievement.

f. Is it possible that this study will discover a previously unknown condition such as a disease, suicidal intentions or genetic predisposition in a participant as a result of the study procedures?

If Yes → Explain how you will manage the situation.

No

[ ] Yes

[ ] No

g. Will this study collect information about research participants' family history that includes personal identifiers (e.g., secondary subjects)?

Yes → Complete Appendix P

[ ] Yes

[ ] No

h. Is this a double blind randomized study in which neither the participants nor the research team knows the assignment to the study drug or placebo?

Yes

[ ] Yes

[ ] No

If Yes → Describe the unblinding plan
<table>
<thead>
<tr>
<th>Section 6 - PARTICIPANT IDENTIFICATION, RECRUITMENT, &amp; SELECTION</th>
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<tbody>
<tr>
<td>a. Specify the recruitment methods for this study and attach copies of written documents to this application.</td>
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</tbody>
</table>

b. Who will approach or recruit potential participants?

- [x] Principal Investigator
- [ ] Research Staff
- [ ] Other please describe: 

<table>
<thead>
<tr>
<th>c. When/how often will participants be recruited? (e.g., before/after a counseling visit, via email with 3 reminders sent at specific intervals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Via email with 2 reminders sent at weekly intervals</td>
</tr>
</tbody>
</table>

d. Where will participants be recruited? (e.g., doctor's office, classroom, online)

Online survey of students, via school email. Parents will be reached using paper consent forms handed out by teacher.

e. What steps will be taken to avoid coercion or undue influence in the recruitment of research participants? (e.g., will the potential participants be offered the opportunity to take material home and discuss the study with family members and/or primary care providers?)

Students will first need active parental approval; therefore they will have the opportunity to discuss the study with family members and/or primary care providers prior to participation.

<table>
<thead>
<tr>
<th>Section 7 - INCENTIVES or COMPENSATION TO PARTICIPATE</th>
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</thead>
<tbody>
<tr>
<td>a. Will participants receive compensation or other incentives (e.g., free services, cash payments, gift certificates, parking, classroom credit, travel reimbursement) to participate in the research study?</td>
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</table>

*Compensation plans should be pro-rated (not contingent upon study completion) and should consider participation withdrawals, as applicable.*

If Yes → Describe the compensation/incentive. Include the amount and timing of all payments.
b. Have you reviewed the Procedures for Compensating Research Participants policy that is available on our website at [http://www.kent.edu/research/researchsafetyandcompliance/irb/forms.cfm](http://www.kent.edu/research/researchsafetyandcompliance/irb/forms.cfm)?

<table>
<thead>
<tr>
<th>Section 8 - INFORMED CONSENT PROCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The human subject protection regulations at 45 CFR 46:</td>
</tr>
<tr>
<td>* List ten basic elements of information that must be provided to subjects when investigators are seeking informed consent from subjects to participate in research (unless the IRB approves a request for a waiver/alteration of any/all of the basic elements for consent.)*</td>
</tr>
<tr>
<td>The basic elements of consent are:</td>
</tr>
<tr>
<td>✓ Purpose, procedures and expected duration of the research</td>
</tr>
<tr>
<td>✓ Risks and discomforts</td>
</tr>
<tr>
<td>✓ Potential benefits</td>
</tr>
<tr>
<td>✓ Alternative procedures or treatments (if any)</td>
</tr>
<tr>
<td>✓ Compensation for participation in the research (if any)</td>
</tr>
<tr>
<td>✓ Provisions for confidentiality</td>
</tr>
<tr>
<td>✓ Management of research related injury</td>
</tr>
<tr>
<td>✓ Contacts for additional information</td>
</tr>
<tr>
<td>✓ Voluntary participation and the right to discontinue participation without penalty</td>
</tr>
<tr>
<td>* Require that participants sign a consent form (unless the IRB approves a request for a waiver of documented consent.)*</td>
</tr>
</tbody>
</table>

If participants cannot give informed consent, it must be obtained from their legal representatives. For example, when subjects are minors (under 18) or when they are mentally incapacitated, consent from a legal representative (such as a parent or legal guardian) is required.

To develop a consent form, begin by using the consent form template that is available from our website at [http://www.kent.edu/research/researchsafetyandcompliance/irb/forms.cfm](http://www.kent.edu/research/researchsafetyandcompliance/irb/forms.cfm).

<table>
<thead>
<tr>
<th>a. Who will discuss and obtain consent from participants?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Principal Investigator</td>
</tr>
<tr>
<td>☑ Research key personnel</td>
</tr>
<tr>
<td>☑ Other: Specify [ ]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. Are you requesting approval for a waiver/alteration of any/all of the basic elements of consent (see information above) for any part of the research? (e.g., investigators conducting research that involves deception might request a waiver/alteration of the basic elements of consent so that the true purpose of the research is not disclosed in the consent form.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Yes [Complete Appendix M3]</td>
</tr>
<tr>
<td>☑ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c. Are you requesting a waiver of the requirement for participants to sign a consent document? (e.g., an investigator conducting research that only involves the use of anonymous surveys might request a waiver of signed consent.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Yes [Complete Appendix M3]</td>
</tr>
<tr>
<td>☑ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>d. Describe who will provide consent or permission (i.e. participant, legally authorized representative, parent and/or guardian)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ N/A</td>
</tr>
</tbody>
</table>

Parents/guardians will be informed by parent consent form [see attached]. These forms will be distributed in class. Parents who approve the participation are instructed to select either the "I wish my child to participate" or "I do not wish my child to participate" options and return it to the researchers. Their kids therefore will be invited to participate. Students’
with parental permission to participate in the study and currently enrolled in a health education course will be presented with the questionnaire electronically. Students will be asked to sign giving ascent to participate in the study.

e. Check all that apply:

| ☐ Informed Consent– Signed Form | ☑ Parental Permission – Form |
| ☑ Informed Consent – Verbal Script/Online/Unsigned form | ☐ Parental Permission – Verbal Script/Online/Unsigned |
| ☐ Assent – Form | ☐ Translated Consent/Assent – Form(s), Script(s), etc. (provide copy of English version with description the qualifications of the translator). |
| ☑ Assent – Verbal/Online/Unsigned | ☐ Photograph/video/audio taping consent form (or permission for photographs/video/audiotaping included as section on informed consent) |
| ☐ Not Applicable (existing data or specimens) | ☐ Other (Specify): |

f. Describe the consent process. Explain when and where consent will be obtained and how subjects and/or their legally authorized representatives will be provided sufficient opportunity (e.g., waiting period, if any) to consider participation.

A parental informed consent distributed in class. Students will be asked to have parents sign and return within one week given permission or declining participation. Students with parental permission to participate in the study and currently enrolled in a health education course will be presented with the questionnaire electronically. Students will be asked to sign giving ascent if 12 years or younger and via a student informed consent if 13 years or older to participate in the study.

g. Will any other tools (e.g., quizzes, visual aids, information sheets) be used during the consent process to assist participant comprehension?

☐ Yes → Provide copies of these tools

☐ No
**Section 10 - PRIVACY OF PARTICIPANTS**

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>a. Describe the provisions to protect the privacy interests of the participants. Consider the circumstances and nature of information to be obtained, taking into account factors (e.g., age, gender, ethnicity, education level, etc.) that may influence participants’ expectations of privacy.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Questionnaire will be distributed electronically.</td>
</tr>
<tr>
<td>b. Does the research require access to personally identifiable private information?</td>
<td>[ ] Yes  [ ] No</td>
</tr>
<tr>
<td></td>
<td>If Yes → Describe the personally identifiable private information involved in the research. List the information source(s) (e.g., educational records, surveys, medical records, etc.).</td>
</tr>
<tr>
<td>c. Explain any circumstances (ethical or legal) where it would be necessary to break confidentiality.</td>
<td>[ ] N/A</td>
</tr>
<tr>
<td>d. Will this study obtain IDENTIFIABLE information from students’ educational records?</td>
<td>[ ] Yes  [ ] No</td>
</tr>
<tr>
<td></td>
<td>If Yes → Does the individual obtaining the information have legitimate access (e.g. as the student’s teacher/professor)?</td>
</tr>
<tr>
<td></td>
<td>The FERPA (Family Educational Rights and Privacy Act) applies when student educational records are used for research. FERPA requires a signed permission when IDENTIFIABLE information from student records is released to anyone who did NOT already have legitimate access.</td>
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</table>

**Section 11 - CONFIDENTIALITY OF DATA**

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<table>
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<tbody>
<tr>
<td>a. What format will be used to store participant information? Check all that apply.</td>
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<tr>
<td></td>
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<tr>
<td>Hardcopy paper documentation</td>
<td>Audio Tapes</td>
</tr>
<tr>
<td>Database system</td>
<td>Video Tapes</td>
</tr>
<tr>
<td>Disk (CD ROM, floppy disk, flash drive)</td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td>Specify:</td>
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<tr>
<td>b. How will the participant information be kept secure and confidential? Check all that apply.</td>
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<tr>
<td>File cabinets with combination or key lock</td>
<td>Biometric authentication (e.g. fingerprints, voice, retinal/iris scan</td>
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<tr>
<td>Locked room with cardkey access</td>
<td>Freezer with a padlock</td>
</tr>
<tr>
<td>Off-site backup vendor</td>
<td>NIH Certificate of Confidentiality</td>
</tr>
<tr>
<td>Electronic records with user identification/password</td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td>Specify:</td>
</tr>
<tr>
<td>c. Will you be retaining identifying information for purposes of another research project (e.g. keeping participants’ contact information to recruit them for future research)?</td>
<td>[ ] Yes  [ ] No</td>
</tr>
<tr>
<td></td>
<td>If Yes → Describe what information will be retained. The information must also be described in the consent form.</td>
</tr>
</tbody>
</table>
d. How will access to participant information be revoked when a staff member leaves the study?

Qualtrics' online survey platform will be used through Kent State University. Only the PI and research team members will have access to the database. The PI will have the right to setup who will have the access.

e. Indicate what will happen to the identifiable data at the end of the study. **Research data should be retained for a minimum of three years after final project closeout (i.e., no further data collection, long term follow-up, re-contact, or analysis of identifiable/coded data.)**

- [ ] Identifiers will be permanently removed from the data and destroyed (de-identified)
- [x] Identifiable/coded (linked) data will be retained and stored confidentially
- [ ] Identifiable data will be retained and may be made public with participant consent (e.g., ethnographic research)
- [ ] Identifiable data were not collected

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**Section 12 – COST TO PARTICIPANTS or REIMBURSEMENTS**

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<table>
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<tbody>
<tr>
<td>a. Are there any potential costs that participants (or their insurers) will incur as a result of study participation (e.g., parking, study drugs, diagnostic tests, etc.).</td>
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<td></td>
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<tr>
<td>b. Are there any costs to participants that will be covered/reimbursed by the research study.</td>
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</tbody>
</table>

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**Section 13 - APPLICATION CONTENTS**

Indicate the documents being submitted for this research project. Check all appropriate boxes.

- Use of Human Subjects in Research Application
- Appendix A: Additional Co-Investigators & Key Personnel (questions 3 & 4)
- Appendix B: Addition of External Co-Investigators & Key Personnel
- Appendix C: Data Repositories
- Appendix D: Deception
- Appendix E: Devices
- Appendix F: Drugs or Biologics
- Appendix G: Genetic Testing
- Appendix I: Children
- Appendix J: Non-English Speaking Participants
- Appendix K: Pregnant Women/Fetuses/Neonates
- Appendix L: Prisoners
- Appendix M: Waiver or Alternation of Elements of Consent
Section 14 - ASSURANCE: PRINCIPAL INVESTIGATOR (an if applicable, ADVISOR)

I agree to follow all applicable policies and procedures of Kent State University and federal, state, and local laws and guidance regarding the protection of human subjects in research, as well as professional practice standards and generally accepted good research practice guidelines for investigators, including, but not limited to, the following:

- Perform the research as approved by the IRB with appropriately trained and qualified personnel with adequate resources;
- Initiate the research after written notification of IRB approval has been received;
- Obtain and document (unless waived) informed consent and HIPAA research authorization from human subjects (or their legally authorized representatives) prior to their involvement in the research using the currently IRB-approved consent form(s) and process;
- Promptly report to the IRB events that may represent unanticipated problems involving risks to subjects or others;
- Provide significant new findings that may relate to the subjects willingness to continue to participate;
- Inform the IRB of any proposed changes in the research or informed consent process before changes are implemented, and agree that no changes will be made until approved by the KSU IRB (except where necessary to eliminate apparent immediate hazards to participants);
- Complete and submit a Continuing Review of Human Subjects Research application before the deadline for review at intervals determined by the IRB to be appropriate to the degree of risk (but not less than once per year) to avoid expiration of IRB approval and cessation of all research activities;
- Maintain research-related records (and source documents) in a manner that documents the validity of the research and integrity of the data collected, while protecting the confidentiality of the data and privacy of participants;
- Retain research-related records for audit for a period of at least three years after the research has ended (or longer, according to sponsor or publication requirements) even if I leave the University;
- Contact the Research Compliance for assistance in amending (to request a change in Principal Investigator) or terminating the research if I leave the University or am unavailable to conduct or supervise the research personally (e.g., sabbatical or extended leave);
**KENT STATE UNIVERSITY**

- Provide a Final Study Report to the IRB when all research activities have ended (including data analysis with individually identifiable or coded private information); and
- Inform all Co-Investigators, research staff, employees, and students assisting in the conduct of the research of their obligations in meeting the above commitments.

I verify that the information provided in this Use of Human Subjects in Research application is accurate and complete.

<table>
<thead>
<tr>
<th>Signature of Principal Investigator</th>
<th>Date</th>
</tr>
</thead>
</table>

Printed name of Principal Investigator

*If PI is a Student:*

<table>
<thead>
<tr>
<th>Signature of Advisor</th>
<th>Date</th>
</tr>
</thead>
</table>

Email: [Blank]

Phone: [Blank]

Printed Name of Advisor
INSTRUCTIONS for INVESTIGATORS:

1. Complete this form to add KSU-affiliated Co-Investigator(s) or Key Personnel to research that involves human subjects.

2. Submit this completed document with your application via email attachment. To submit the form with a typed signature, the form must be submitted from the investigator’s @kent.edu email account. If completed form is signed and then scanned as a PDF attachment, the @kent.edu email requirement does not apply.

3. Do NOT begin data collection prior to receiving notification from the KSU IRB that the study/modification has been fully approved.

DEFINITIONS

Key personnel:
Individuals who participate in the design, conduct, or reporting of human subjects research. At a minimum, include individuals who recruit participants, obtain consent, or who collect study data.

Conflict of Interest is a financial interest or other opportunity for tangible personal benefit of an individual or his/her immediate family that may exert a substantial and improper influence on the individual’s professional judgment in exercising any institutional duty or responsibility, including the conduct or design of research.

Financial Conflict of Interest:
An interest of an individual (or his/her immediate family) of monetary value that would reasonably appear to be affected by the research or an individual’s interest in any entity whose financial interests would reasonably appear to be affected by the research. Financial interests include (but are not limited to) salary or other payments for services (e.g., consulting fees or honoraria), equity interests (e.g., stocks, stock options, or other ownership interests), and intellectual property rights (e.g., patents, copyrights, and royalties from such rights).

Non-Financial Conflict of Interest:
An interest other than monetary of an individual (or his/her immediate family) in the design, conduct, or reporting of the research or other interest that competes with the obligation to protect research participants and potentially compromises the objectivity and credibility of the research process.

Immediate Family:
An investigator’s or Key personnel’s spouse or domestic partner and dependent children.

Section I - KSU PRINCIPAL INVESTIGATOR INFORMATION

Last Name: Ding First Name: Kele

Title or, IRB log number of Research (should match Human Subjects Research Application)

An Analysis of the impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement Among Middle and High School Students
APPENDIX A1 – Co-Investigator(s) or Key Personnel

KSU CO-INVESTIGATOR(S) and/or KEY PERSONNEL (#1)

Co-Investigator [ ]

Key Personnel [ ]

Faculty [ ]

Graduate Student [ ]

Undergraduate Student [ ]

Staff [ ]

Name (Last, First, MI): Crawley, Manuella, B

E-mail: Mcroll3 @kent.edu

Phone: 440-333-2007

a. Have Co-Investigator(s)/Key personnel completed the CITI online (or equivalent) training?

[ ] Yes [ ] attach copy of completion certificate. 

[ ] No

b. Describe the role/activities that this Co-investigator or Key Personnel will perform for this study (e.g., subject recruitment, informed consent):

This co-investigator is going to be the contact person for the study as this is her dissertation study. She will be collecting, analyzing and evaluating the data.

c. Where will the Co-investigator or Key Personnel perform the research activities?

[ ] at KSU

[ ] at external research site [complete

Appendix [ ]

d. Does Co-Investigator or Key personnel have a Conflict of Interest related to the research?

[ ] Yes [ ] provide explanation below

[ ] No

e. Does Co-Investigator or Key personnel have a patent or, pending patent, or current patent idea that could be conceivably related to this research project?

[ ] Yes [ ] provide explanation below.

[ ] No

Explanation:

f. Has/Will Co-Investigator or Key personnel receive funds or, other resources (including equipment, devices, etc...) from a Sponsor or funding agency/entity for purposes of this research project?

[ ] Yes [ ] provide explanation below.

[ ] No

Explanation:

I agree to follow all applicable policies and procedures of Kent State University and federal, state, and local laws and guidance regarding the protection of human subjects in research, as well as professional practice standards and generally accepted good research practice guidelines for investigators, including, but not limited to, the following:
APPENDIX A1 – Co-Investigator(s) or Key Personnel

IRB LOG NUMBER _______________________________

KSU Co-Investigator(s) or Key Personnel

- Perform the research as approved by the IRB under the direction of the Principal Investigator (or Advisor) by appropriately trained and qualified personnel with adequate resources;
- Initiate the research after written notification of IRB approval has been received;
- Obtain and document (unless waived) informed consent and HIPAA research authorization from human subjects (or their legally authorized representatives) prior to their involvement in the research using the currently IRB-approved consent form(s) and process;
- Promptly report to the IRB events that may represent unanticipated problems involving risks to subjects or others;
- Provide significant new findings that may relate to the subjects willingness to continue to participate;
- Inform the IRB of any proposed changes in the research or informed consent process before changes are implemented, and agree that no changes will be made until approved by the KSU IRB (except where necessary to eliminate apparent immediate hazards to participants);
- If applicable, complete and submit a Continuing Review of Human Subjects Research application before the deadline for review at intervals determined by the IRB to be appropriate to the degree of risk (but not less than once per year) to avoid expiration of IRB approval and cessation of all research activities;
- Maintain research-related records (and source documents) in a manner that documents the validity of the research and integrity of the data collected, while protecting the confidentiality of the data and privacy of participants;
- Retain research-related records for audit for a period of at least three years after the research has ended (or longer, according to sponsor or publication requirements) even if I leave the University;

I verify that the information provided in this form is accurate and complete.

Signature: _______Manuella Crawley ________________________ Date: 5-13-2013__________

KSU CO-INVESTIGATOR(S) and/or KEY PERSONNEL (#2)

☐ Co-Investigator Status:
☐ Key Personnel ☐ Faculty ☐ Graduate Student ☐ Undergraduate Student ☐ Staff

Name (Last, First, MI):

E-mail: @kent.edu Phone:

g. Have Co-Investigator(s)/Key personnel completed the CITI online (or equivalent) training? ☐ Yes attach copy of completion certificate. ☐ No

h. Describe the role/activities that this Co-investigator or Key Personnel will perform for this study (e.g., subject recruitment, informed consent):

i. Where will the Co-investigator or Key Personnel perform the research activities?
☐ at KSU ☐ at external research site complete Appendix D

j. Does Co-Investigator or Key personnel have a Conflict of Interest related to the research? ☐ Yes provide explanation below ☐ No
APPENDIX A1 – Co-Investigator(s) or Key Personnel

KENT STATE UNIVERSITY

KSU Co-Investigator(s) or Key Personnel

Refer to definitions above.

Explaination:

k. Does Co-Investigator or Key personnel have a patent or, pending patent, or current patent idea that could be conceivably related to this research project?

☐ Yes → provide explanation below.

☐ No

Explaination:

l. Has/will Co-Investigator or Key personnel receive funds or, other resources (including equipment, devices, etc...) from a Sponsor or funding agency/entity for purposes of this research project?

☐ Yes → provide explanation below.

☐ No

Explanations:

I agree to follow all applicable policies and procedures of Kent State University and federal, state, and local laws and guidance regarding the protection of human subjects in research, as well as professional practice standards and generally accepted good research practice guidelines for investigators, including, but not limited to, the following:

- Perform the research as approved by the IRB under the direction of the Principal Investigator (or Advisor) by appropriately trained and qualified personnel with adequate resources;
- Initiate the research after written notification of IRB approval has been received;
- Obtain and document (unless waived) informed consent and HIPAA research authorization from human subjects (or their legally authorized representatives) prior to their involvement in the research using the currently IRB-approved consent form(s) and process;
- Promptly report to the IRB events that may represent unanticipated problems involving risks to subjects or others;
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- If applicable, complete and submit a Continuing Review of Human Subjects Research application before the deadline for review at intervals determined by the IRB to be appropriate to the degree of risk (but not less than once per year) to avoid expiration of IRB approval and cessation of all research activities;
- Maintain research-related records (and source documents) in a manner that documents the validity of the research and integrity of the data collected, while protecting the confidentiality of the data and privacy of participants;
- Retain research related records for audit for a period of at least three years after the research has ended (or longer, according to sponsor or publication requirements) even if I leave the University;
- I verify that the information provided in this form is accurate and complete.

Signature ____________________________ Date ________________

Copy and Paste table if additional Co-Investigators/Key Personnel.
INSTRUCTIONS for INVESTIGATORS:

1. Complete this form to request inclusion of participants who are considered children.
2. Submit this completed document with the Human Subjects Research application via email attachment. To submit the form with a typed signature, the form must be submitted from the Investigator's @kent.edu email account. If completed form is signed and then scanned as a PDF attachment, the @kent.edu email requirement does not apply.
3. Do NOT begin data collection prior to receiving notification from the KSU IRB that the IAA agreement has been fully approved.

DEFINITIONS:

Children/Child - Person(s) who have not attained the legal age for consent to treatments or procedures involved in the research, under the applicable law of the jurisdiction in which the research will be conducted.

Minimal risk:
The probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

Section I - KSU Investigator Information

Last Name: Ding  First Name: Kele

Title of Study (should match Human Subjects Research Application)
An Analysis of the impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement Among Middle and High School Students

1. Select the category that best describes the research and provide the corresponding information:
   - Not greater than minimal risk  → Go to Question #2
   - More than minimal risk is presented by an intervention or procedure that holds the prospect of direct benefit for the individual child, or by a monitoring procedure that is likely to contribute to the child's well-being
     a. Explain how the risk is justified by the anticipated benefit to the individual child.
     b. Explain how the relation of the anticipated benefit to the risk is at least as favorable to the child as that which would be presented by available alternative approaches (e.g., other treatments).
More than minimal risk is presented by an intervention or procedure that **does not** hold the prospect of direct benefit for the individual child, or by a monitoring procedure that is not likely to contribute to the child’s well-being.

a. Explain how the risk represents a minor increase over minimal risk.

b. Explain how the intervention or procedure presents experiences to children that are reasonably commensurate with those inherent in their actual or expected medical, dental, psychological, social, or educational situations.

c. Explain how the intervention or procedure is likely to yield generalizable knowledge about the child's disorder or condition that is of vital importance for the understanding or amelioration of the child's disorder or condition.

2. Explain the process of obtaining informed consent/assent from children and their parents (i.e., will parents and children be approached separately or together?).

Parents will be approached first via email for to provide passive informed consent. Student assent will be collected prior to the completion of the survey.

3. Will the parents or guardians be present with the child during other discussions of the research? [ ] Yes [ ] No

4. Will incentives be offered to the research participants? [ ] Yes [ ] No

   **If Yes,** complete the following:

   a. Specify the incentives:

   b. The incentives will be offered to: [ ] Child [ ] Parent

5. Will sensitive or private information (e.g., questionnaires, test results) be shared with the parents/guardians? [ ] Yes [ ] No

   **If Yes** Explain

6. If participation is to continue beyond the time that the child is 18 years of age, describe the process to be used to re-consent the participant. [ ] N/A
APPENDIX I - Children

Is there a possibility that any of the research participants will be wards of the State or any other agency or institution?

☑ Yes
☐ No
## INSTRUCTIONS for INVESTIGATORS:

1. Complete this form to include performance sites outside of Kent State University for your research activity (e.g., obtaining consent, conducting research procedures, obtaining or accessing identifiable data for research purposes, etc.)

2. OR

Any component of your research will be conducted by collaborators outside of Kent State University and you are responsible for coordinating the conduct of all or part of this research (e.g., you are running the study at multiple locations; you are conducting or coordinating parts of the research such as follow-up at multiple locations; your data analysis work is being done at an outside institution.)

3. Submit this completed document via email along with the Human Subjects Research application.

4. Retain a copy of the Human Subjects application and applicable attachments.

5. Do NOT begin data collection prior to receiving notification from the KSU IRB that your application has been fully approved or determined by the IRB to be exempt from annual review.

## DEFINITIONS

**Engaged in Research**: an institution is considered engaged in research when its employees or agents for the purposes of the research project obtain: (1) data about the subjects of the research through intervention or interaction with them; (2) identifiable private information about the subjects of the research; or (3) the informed consent of human subjects for the research.

**Performance Site**: a site whose staff, facilities or private records of individuals are engaged in the conduct of research; or a site that receives HHS funds. The performance site is the actual place where the research activity (e.g., site where staff are consenting subjects).

**IRB of Record**: The IRB responsible for review of research and for determining that the research meets the regulatory requirements for approval.

## Section I - KSU Investigator Information

Last Name: Ding  First Name: Kele

**Title of Study (should match Human Subjects Research Application)**

An Analysis of the impact of Social Support Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement Among Middle and High School Students
**APPENDIX O – Multi-site Study**

<table>
<thead>
<tr>
<th>Performance site #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Name of Performance Site (e.g. Oriana House, Akron Children’s Hospital, Summa, School)</td>
</tr>
<tr>
<td>Buckeye Local School District</td>
</tr>
<tr>
<td>2. Who is conducting research activities at this Performance Site?</td>
</tr>
<tr>
<td>☑ KSU PI, CO-PI or key personnel</td>
</tr>
<tr>
<td>☐ Collaborator → Local PI Name:</td>
</tr>
<tr>
<td>3. Performance Site contact name &amp; phone number for IRB matters</td>
</tr>
<tr>
<td>Mr. Joseph Spiccia (Superintendent)</td>
</tr>
<tr>
<td>4. Who will be the IRB of Record for research conducted at this Performance Site?</td>
</tr>
<tr>
<td>☑ KSU IRB → answer question #5</td>
</tr>
<tr>
<td>☐ Performance Site’s IRB → provide FWA # and expiration</td>
</tr>
<tr>
<td>☐ Other IRB → Name:</td>
</tr>
<tr>
<td>5. If KSU is the IRB of Record, what is the method of documenting the Performance site’s reliance on our IRB?</td>
</tr>
<tr>
<td>☐ Master IRB Collaboration Agreement (currently only applicable for Summa)</td>
</tr>
<tr>
<td>☑ IRB Authorization Agreement (applicable for a location with an FWA)</td>
</tr>
<tr>
<td>☑ Individual Investigator Agreement/Letter of Support (applicable for researchers at locations with no FWA)</td>
</tr>
<tr>
<td>6. If KSU is not the IRB of record, has the site’s local IRB granted approval?</td>
</tr>
<tr>
<td>☐ No → Explain:</td>
</tr>
<tr>
<td>☑ Yes → provide dates of site IRB Approval: ______ to: ______ (attach copy of the Performance Site’s IRB Approval letter). ☑ Performance Site’s IRB file number: _____</td>
</tr>
<tr>
<td>7. What are the study procedures that will take place at this Performance Site (e.g., conduct research interviews; obtain informed consent, accessing records).</td>
</tr>
<tr>
<td>Parental passive consent via email notification of study followed by online questionnaire distributed to students of this school district participating in summer school classes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance site #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Name of Performance Site (e.g. Oriana House, Akron Children’s Hospital, Summa, School)</td>
</tr>
<tr>
<td>9. Who is conducting research activities at this Performance Site?</td>
</tr>
<tr>
<td>Question</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10. Performance Site contact name &amp; phone number for IRB matters</td>
</tr>
<tr>
<td>11. Who will be the IRB of Record for research conducted at this Performance Site?</td>
</tr>
<tr>
<td><strong>If KSU is the IRB of Record, what is the method of documenting the Performance site’s reliance on our IRB?</strong></td>
</tr>
<tr>
<td>Master IRB Collaboration Agreement (currently only applicable for Summa)</td>
</tr>
<tr>
<td>IRB Authorization Agreement (applicable for a location with an FWA)</td>
</tr>
<tr>
<td>Individual Investigator Agreement/Letter of Support (applicable for researchers at locations with no FWA)</td>
</tr>
<tr>
<td>12. If KSU is not the IRB of record, has the site’s local IRB granted approval?</td>
</tr>
<tr>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td>14. What are the study procedures that will take place at this Performance Site (e.g., conduct research interviews, obtain informed consent, accessing records).</td>
</tr>
</tbody>
</table>

**If additional Performance Site’s, copy/paste table below.
This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to improve health education for young people like yourself. The answers you give will be kept private. No one will know what you answer.

The next 5 questions ask about physical activity.

1. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
   A. 0 days  
   B. 1 day  
   C. 2 days  
   D. 3 days  
   E. 4 days  
   F. 5 days  
   G. 6 days  
   H. 7 days

2. On an average school day, how many hours do you watch TV?
   A. I do not watch TV on an average school day  
   B. Less than 1 hour per day  
   C. 1 hour per day  
   D. 2 hours per day  
   E. 3 hours per day  
   F. 4 hours per day  
   G. 5 or more hours per day

3. On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Count time spent on things such as Xbox, PlayStation, an iPod, an iPad or other tablet, a smartphone, YouTube, Facebook or other social networking tools, and the Internet.)
   A. I do not play video or computer games or use a computer for something that is not school work  
   B. Less than 1 hour per day  
   C. 1 hour per day  
   D. 2 hours per day  
   E. 3 hours per day  
   F. 4 hours per day  
   G. 5 or more hours per day

4. In an average week when you are in school, on how many days do you go to physical education (PE) classes?
   A. 0 days  
   B. 1 day  
   C. 2 days  
   D. 3 days  
   E. 4 days  
   F. 5 days
The next 9 questions ask about food you ate or drank during the past 7 days. Think about all the meals and snacks you had from the time you got up until you went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

6. During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)
A. I did not drink 100% fruit juice during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

7. During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)
A. I did not eat fruit during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

8. During the past 7 days, how many times did you eat green salad?
A. I did not eat green salad during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

9. During the past 7 days, how many times did you eat potatoes? (Do not count french fries, fried potatoes, or potato chips.)
A. I did not eat potatoes during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day
10. During the past 7 days, how many times did you eat carrots?
A. I did not eat carrots during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

11. During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)
A. I did not eat other vegetables during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

12. During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)
A. I did not drink soda or pop during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

13. During the past 7 days, how many glasses of milk did you drink? (Count the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)
A. I did not drink milk during the past 7 days
B. 1 to 3 glasses during the past 7 days
C. 4 to 6 glasses during the past 7 days
D. 1 glass per day
E. 2 glasses per day
F. 3 glasses per day
G. 4 or more glasses per day

14. During the past 7 days, on how many days did you eat breakfast?
A. 0 days
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days
G. 6 days
H. 7 days

15. Below is a list of things people might do or say to someone who is trying to improve their eating habits. We are interested in high fat and high salt (or high sodium) foods. If you are not trying to make
any of these dietary changes, then some of the questions may not apply to you, but please read and give an answer to every question.

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>Rarely</th>
<th>a few times</th>
<th>often</th>
<th>very often</th>
<th>does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

During the past three months, my family (or members of my household):

<table>
<thead>
<tr>
<th></th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Encouraged me not to eat &quot;unhealthy foods&quot; (cake, salted chips) when I'm tempted to do so.</td>
</tr>
<tr>
<td>2.</td>
<td>Discussed my eating habit. changes with me (asked me how I'm doing with my eating changes).</td>
</tr>
<tr>
<td>3.</td>
<td>Reminded me not to eat high fat, high salt foods.</td>
</tr>
<tr>
<td>4.</td>
<td>Complimented me on changing my eating habits (&quot;Keep it up&quot;, &quot;We are proud of you&quot;).</td>
</tr>
<tr>
<td>5.</td>
<td>Commented if I went back to my old eating habits.</td>
</tr>
<tr>
<td>6.</td>
<td>Ate high fat or high salt foods in front of me.</td>
</tr>
<tr>
<td>7.</td>
<td>Refused to eat the same foods I eat.</td>
</tr>
<tr>
<td>8.</td>
<td>Brought home foods I'm trying not to eat.</td>
</tr>
<tr>
<td>9.</td>
<td>Got angry when I encouraged them to eat low salt, low fat foods.</td>
</tr>
<tr>
<td>10.</td>
<td>Offered me food I'm trying not to eat.</td>
</tr>
</tbody>
</table>

During the past three months, my friends:

<table>
<thead>
<tr>
<th></th>
<th>Friends</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Encouraged me not to eat &quot;unhealthy foods&quot; (cake, salted chips) when I'm tempted to do so.</td>
</tr>
<tr>
<td>2.</td>
<td>Discussed my eating habit. changes with me (asked me how I'm doing with my eating changes).</td>
</tr>
<tr>
<td>3.</td>
<td>Reminded me not to eat high fat, high salt foods.</td>
</tr>
<tr>
<td>4.</td>
<td>Complimented me on changing my eating habits (&quot;Keep it up&quot;, &quot;We are proud of you&quot;).</td>
</tr>
<tr>
<td>5.</td>
<td>Commented if I went back to my old eating habits.</td>
</tr>
<tr>
<td>6.</td>
<td>Ate high fat or high salt foods in front of me.</td>
</tr>
<tr>
<td>7.</td>
<td>Refused to eat the same foods I eat.</td>
</tr>
<tr>
<td>8.</td>
<td>Brought home foods I'm trying not to eat.</td>
</tr>
<tr>
<td>9.</td>
<td>Got angry when I encouraged them to eat low salt, low fat foods.</td>
</tr>
<tr>
<td>10.</td>
<td>Offered me food I'm trying not to eat.</td>
</tr>
</tbody>
</table>
16. Below is a list of things people might do or say to someone who is trying to exercise regularly. If you are not trying to exercise, then some of the questions may not apply to you, but please read and give an answer to every question.

<table>
<thead>
<tr>
<th>None</th>
<th>Rarely</th>
<th>A few times</th>
<th>Often</th>
<th>Very often</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

During the past three months, my family (or members of my household):

11. Exercised with me.  
12. Offered to exercise with me.  
13. Gave me helpful reminders to exercise ("Are you going to exercise tonight?").  
14. Gave me encouragement, to stick with my exercise program.  
15. Changed their schedule so we could exercise together.  
16. Discussed exercise with me.  
17. Complained about the time I spend exercising.  
18. Criticized me or made fun of me for exercising.  
19. Gave me rewards for exercising (bought me something or gave me something I like).  
20. Planned for exercise on recreational outings.  
21. Helped plan activities around my exercise.  
22. Asked me for ideas on how they can get more exercise.  
23. Talked about how much they like to exercise.

During the past three months, my friends:

1. Exercised with me.  
2. Offered to exercise with me.  
3. Gave me helpful reminders to exercise ("Are you going to exercise tonight?").  
4. Gave me encouragement, to stick with my exercise program.  
5. Changed their schedule so we could exercise together.  
6. Discussed exercise with me.  
7. Complained about the time I spend exercising.  
8. Criticized me or made fun of me for exercising.  
9. Gave me rewards for exercising (bought me something or gave me something I like).  
10. Planned for exercise on recreational outings.  
11. Helped plan activities around my exercise.  
22. Asked me for ideas on how they can get more exercise.  
23. Talked about how much they like to exercise.

17. How much does your school encourage you to eat healthy food?

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little</th>
<th>Some</th>
<th>Very Much</th>
</tr>
</thead>
</table>
18. How much does your school encourage you to be physically active? 

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little</th>
<th>Some</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

19. During the past 12 months, how would you describe your grades in school? 

A. Mostly A's 
B. Mostly B's 
C. Mostly C's 
D. Mostly D's 
E. Mostly F's 
F. None of these grades 
G. Not sure 

20. How old are you? 

A. 10 years old or younger 
B. 11 years old 
C. 12 years old 
D. 13 years old 
E. 14 years old 
F. 15 years old 
G. 16 years old 
H. 17 years old 
I. 18 years old or older 

19. What is your sex? 

A. Female 
B. Male
Informed Consent to Participate in a Research Study

**Study Title:** The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement among Middle and High School Students

Hello Parents,

Your child is being invited to participate in a research study. This consent form will provide you with information on the research project, what your child will need to do, and the associated risks and benefits of the research. Your child’s participation is voluntary. Please read this form carefully. It is important that you fully understand the research in order to make an informed decision. You may print this document for your records.

The purpose of this study to investigate the impact of social support from family, friends and schools and selected demographics on middle school student’s physical activity, dietary behavior and academic achievement.

Students will be asked to complete a web-based questionnaire. Participation in the study typically takes 20 minutes and is strictly anonymous. All responses are treated as confidential, and in no case will responses from individual participants be identified. Rather, all data will be pooled and published in aggregate form only. Participants should be aware; however, that the survey is not being run from a "secure" https server of the kind typically used to handle credit card transactions, so there is a small possibility that responses could be viewed by unauthorized third parties (e.g., computer hackers).

Your child’s participation will require him/her to complete a web-based questionnaire. The questionnaire completion should take approximately twenty minutes.

This research will not benefit you or your child directly. However, your child’s participation in this study will help us to better understand student’s perceptions regarding social support and how these link to physical activity and dietary behaviors as well as academic achievement.

*There are no anticipated risks beyond those encountered in everyday life.*

Study data, and responses will not be linked to your child. Your child’s study related information will be kept confidential within the limits of the law. Any identifying information will be discarded and anonymously coded. Research participants will not be identified in any publication or presentation of research results; only aggregate data will be used. Participation or non-participation will have no effect on your child’s grade in the classroom.

Taking part in this research study is entirely up to you and your child. You and/or your child may choose not to participate or may discontinue their participation at any time without penalty or loss of benefits to which he/she is otherwise entitled. You will be informed of any new, relevant information that may affect your child’s health, welfare, or willingness to continue participation in this study.

The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement Among Middle and High School Students
If you have any questions or concerns about this research, you may contact Manuella Crawley at 440-313-2007 (mcrawle3@kent.edu) or Principal Investigator Dr. Kele Ding (kding@kent.edu) at 330-672-0688. This project has been approved by the Kent State University Institutional Review Board. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330.672.2704.

I have read this consent form and I voluntarily agree to grant permission for my child to participate in this study. If you wish for your child to participate in this study, simply mark the “I wish for my child to participate in this study” box, fill in your name and relationship to the student, return the form to student’s teacher within one week. If you do not wish your child to participate, please mark the “I do not wish for my child to participate in this study” box, and return it to the teacher. You may print a copy of this consent statement for future reference. Please respond by September 6, 2013.

CONSENT STATEMENT

☐ I wish for my child to participate in this study

☐ I do not wish for my child to participate in this study

Name: ___________________________ Relationship to student: ___________________________

Student Name: ___________________________

Signature

Sincerely,
Manuella Crawley, M.Ed.,CHES
Doctoral Candidate in Health Education and Health Promotion
Kent State University

The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement Among Middle and High School Students
Assent to Participate in a Research Study

Study Title: The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement among Middle and High School Students

Hello,

My name is Manuella Crawley, and I am trying to learn more about how you view the support you receive from your family, friends and your school and how that relates to you physical activity, what you eat and you achievement in school. I would like you to answer a few questions regarding this topic. Do you want to do this? If so follow the link below and complete the survey. This survey will take no more than 20 minutes of your time.

Thank you for participating in this survey,

Manuella Crawley, M.Ed., CHES
Doctoral Candidate in Health Education and Health Promotion
Kent State University
Mcrawle3@kent.edu
Informed Consent to Participate in a Research Study

Study Title: The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement among Middle and High School Students

Hello Students,

You are being invited to participate in a research study. This consent form will provide you with information on the research project, what you will need to do, and the associated risks and benefits of the research. Your participation is voluntary. Please read this form carefully. It is important that you ask questions and fully understand the research in order to make an informed decision. You may print a copy of this document for your records.

The purpose of this study to investigate the impact of social support from family, friends and schools and selected demographics on middle school student’s physical activity, dietary behavior and academic achievement.

You will be asked to complete a web-based questionnaire. Participation in the study typically takes 20 minutes and is strictly anonymous. All responses are treated as confidential, and in no case will responses from individual participants be identified. Rather, all data will be pooled and published in aggregate form only. Participants should be aware; however, that the survey is not being run from a "secure" https server of the kind typically used to handle credit card transactions, so there is a small possibility that responses could be viewed by unauthorized third parties (e.g., computer hackers).

Your participation will require you to complete a web-based questionnaire. The questionnaire completion should take approximately twenty minutes.

This research will not benefit you directly. However, your participation in this study will help us to better understand student’s perceptions regarding social support and how these link to physical activity and dietary behaviors as well as academic achievement.

There are no anticipated risks beyond those encountered in everyday life.

Study data, and responses will not be linked to you. Your study related information will be kept confidential within the limits of the law. Any identifying information will be discarded and anonymously coded. Research participants will not be identified in any publication or presentation of research results; only aggregate data will be used.

Participation or non-participation will have no effect on your grade in the classroom.

Taking part in this research study is entirely up to you. You may choose not to participate or may discontinue their participation at any time without penalty or loss of benefits to which he/she is otherwise entitled. You will

The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement Among Middle and High School Students

Page 1 of 2
be informed of any new, relevant information that may affect your health, welfare, or willingness to continue participation in this study.

If you have any questions or concerns about this research, you may contact Manuella Crawley at 440-313-2007 (mcrawle3@kent.edu) or Principal Investigator Dr. Kele Ding (kding@kent.edu) at 330-672-0688. This project has been approved by the Kent State University Institutional Review Board. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330.672.2704.

I have read this consent form and I voluntarily agree to participate in this study. If you agree, please click on the “I agree” button below to start the survey.
Last week you received an e-mail message asking you to assist us in investigating your perceptions regarding physical activity, dietary behavior and social support by filling out a web-based survey. If you have filled out the survey, thank you!

If you have not had a chance to take the survey yet, I would appreciate your reading the message below and completing the survey.

This message has gone to everyone in the selected sample population. Since no personal data is retained with the surveys for reasons of confidentiality, we are unable to identify whether or not you have already completed the survey. The survey link will be available until _____, 2013.

* If you under 12 years old take the web-based survey, by clicking on the following link:

*If you are 12 years or older, take the web-based survey, by clicking on the following link:

Thank you,
Manuella Crawley, M.Ed., CHES
Kent State University
CITI Collaborative Institutional Training Initiative (CITI)

Responsible Conduct of Research Curriculum Completion Report
Printed on 5/13/2013

Learner: Mamella Crawford (username: mcrawle3)
Institution: Kent State University
Contact Information Department: health education and health promotion
Email: mcrawle3@kent.edu

Social and Behavioral Responsible Conduct of Research Course 1.: This course is for investigators, staff and students with an interest or focus in Social and Behavioral research. This course contains text, embedded case studies AND quizzes.

Stage 1. Basic Course Passed on 10/14/09 (Ref # 3470219)

<table>
<thead>
<tr>
<th>Required Modules</th>
<th>Date Completed</th>
<th>Score</th>
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<tbody>
<tr>
<td>The CITI Course in the Responsible Conduct of Research</td>
<td>10/13/09</td>
<td>no quiz</td>
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<tr>
<td>Introduction to the Responsible Conduct of Research</td>
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</tr>
<tr>
<td>Introduction to Research Misconduct</td>
<td>10/13/09</td>
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<tr>
<td>Research Misconduct 2-1495</td>
<td>10/13/09</td>
<td>6/6 (100%)</td>
</tr>
<tr>
<td>Data Acquisition, Management, Sharing and Ownership 2-1523</td>
<td>10/13/09</td>
<td>5/5 (100%)</td>
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<td>Publication Practices and Responsible Authorship 2-1518</td>
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<td>Peer Review 2-1521</td>
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<td>5/5 (100%)</td>
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<tr>
<td>Responsible Mentoring 09-3625</td>
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<td>6/6 (100%)</td>
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<td>Conflicts of Interest and Commitment 2-1462</td>
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<tr>
<td>Collaborative Research 2-1484</td>
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<td>Kent State University</td>
<td>10/13/09</td>
<td>no quiz</td>
</tr>
</tbody>
</table>

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator
CITI Collaborative Institutional Training Initiative

Social & Behavioral Research - Basic/Refresher Curriculum Completion Report
Printed on 5/13/2013

Learner: Manuela Crawley (username: mcrawle3)
Institution: Kent State University

Contact Information: Department: health education and health promotion
Email: mcrawle3@kent.edu

Social & Behavioral Research - Basic/Refresher: Choose this group to satisfy CITI training requirements for Investigators and staff involved primarily in Social/Behavioral Research with human subjects.

Stage 2. Refresher Course Passed on 05/12/13 (Ref # 8282601)

<table>
<thead>
<tr>
<th>Required Modules</th>
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<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2/2 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 1 – Privacy and Confidentiality</td>
<td>05/12/13</td>
<td>2/2 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 1 – Assessing Risk</td>
<td>05/12/13</td>
<td>2/2 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 1 – Research with Children</td>
<td>05/12/13</td>
<td>2/2 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 1 – International Research</td>
<td>05/12/13</td>
<td>2/2 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 2 – Research with Children</td>
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</tr>
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<td>SBE Refresher 2 – Research in the Public Schools</td>
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<td>1/1 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 2 – International Research</td>
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<td>SBE Refresher 1 – History and Ethical Principles</td>
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<td>SBE Refresher 1 – Federal Regulations for Protecting Research Subjects</td>
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<td>2/2 (100%)</td>
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<td>SBE Refresher 1 – Informed Consent</td>
<td>05/12/13</td>
<td>2/2 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 1 – Research with Prisoners</td>
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<td>2/2 (100%)</td>
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<tr>
<td>SBE Refresher 1 – Research in Educational Settings</td>
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<td>2/2 (100%)</td>
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<td>SBE Refresher 1 – Instructions</td>
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<td>Course</td>
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<td>Score</td>
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<tr>
<td>---------------------------------------------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>SBE Refresher 2 – Informed Consent</td>
<td>05/12/13</td>
<td>1/1 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 2 – Privacy and Confidentiality</td>
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<td>1/1 (100%)</td>
</tr>
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<td>SBE Refresher 2 – Assessing Risk</td>
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<td>1/1 (100%)</td>
</tr>
<tr>
<td>Inclusion of Women and Minorities in Clinical Research</td>
<td>05/12/13</td>
<td>4/4 (100%)</td>
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<td>Completing the SBR 201 Refresher Course</td>
<td>05/12/13</td>
<td>no quiz</td>
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</tbody>
</table>

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator
APPENDIX E

PILOT STUDY IRB APPROVAL
Appendix E

Pilot Study IRB Approval

FW: IRB approval for protocol #13-290 - retain this email for your records
3 messages
From: Richmond, Alton On Behalf Of PAGS Research Compliance
Sent: Monday, August 19, 2013 1:15 PM
To: DDG, KELE
Subject: IRB approval for protocol #13-290 - retain this email for your records

FW: IRB # 13-290 entitled "An Analysis of the impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, Academic Achievement Among Middle and High School Students"

Hello,

I am pleased to inform you that the Kent State University Institutional Review Board reviewed and approved your Application for Approval to Use Human Research Participants as a Level III Expedited project. Approval is effective for a twelve-month period:


*A copy of the IRB approved consent form is attached to this email. This "stamped" copy is the consent form that you must use for your research participants. It is important for you to also keep an unstamped text copy (i.e., Microsoft Word version) of your consent form for subsequent submissions.

Federal regulations and Kent State University IRB policy require that research be reviewed at intervals appropriate to the degree of risk, but not less than once per year. The IRB has determined that this protocol requires an annual review and progress report. The IRB tries to send you annual review reminder notice to by email as a courtesy. However, please note that it is the responsibility of the principal investigator to be aware of the study expiration date and submit the required materials. Please submit review materials (annual review form and copy of current consent form) one month prior to the expiration date.

HHS regulations and Kent State University Institutional Review Board guidelines require that any changes in research methodology, protocol design, or principal investigator have the prior approval of the IRB before implementation and continuation of the protocol. The IRB must also be informed of any adverse events associated with the study. The IRB further requests a final report at the conclusion of the study.
Kent State University has a Federal Wide Assurance on file with the Office for Human Research Protections (OHRP), FWA number 00003746.

If you have any questions or concerns, please contact the Office of Research Compliance at Researchcompliance@kent.edu or 330.672.2704 or 330.672.8058.

Respectfully,

Kent State University Office of Research Compliance
224 Carseright Hall | fax 330.672.2658

Kevin McGeevy | Research Compliance Coordinator | 330.672.8058 | kmccrea@kent.edu
Paulette Washko | Manager, Research Compliance | 330.672.2724 | pwashko@kent.edu

For links to obtain general information, access forms, and complete required training, visit our website at www.kent.edu/research.
APPENDIX F

STUDY IRB
Appendix F

Study IRB

**AMENDMENT/CHANGE to RESEARCH**

**KENT STATE**

**REQUEST for AMENDMENT/CHANGE TO RESEARCH PROJECT**

**INSTRUCTIONS for INVESTIGATORS:**

1. Complete this form to request approval for an amendment or change to an IRB-approved research project.
2. Submit this completed document via email attachment to the IRB office at RESEARCHCOMPLIANCE@kent.edu. To submit the form with a typed signature, the form must be submitted from the Investigator’s @kent.edu email account. If completed form is signed and then scanned as a PDF attachment, the @kent.edu email requirement does not apply.
3. Do NOT implement the amendment or change to research prior to receiving notification from the KSU IRB that the change has been fully approved UNLESS the change is necessary to eliminate apparent immediate hazards to the subjects. In such cases, the investigator must submit a report to the IRB explaining the protocol deviation.

**DEFINITIONS**

**Minor Changes:** Adding non-vulnerable subjects, adding or deleting personnel, etc. such that the risk/benefit is not affected. Typically, these modifications can be reviewed/approved through an expedited procedure (by the IRB Chairperson and Administrator).

**Major Changes:** Changes in procedures, methods, informed consent, or adding of vulnerable populations such that the risk/benefit ratio might be affected. Typically, these need review/approval at a fully convened IRB meeting.

---

**To complete this form:** Single left-click to complete text fields. To check a box, double left-click on the box, then click "checked". Click OK.

**Section I: Investigator Information**

Last Name/Sex, First Name: Role  
IRB Log Number: 23-350

**Title of Study (should match Human Subjects Research Application):**

**An Analysis of the impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior and Academic Achievement Among Middle and High School Students**

**Section II: PROPOSED CHANGE(S):**

1. Are you requesting to modify or add Kent State University affiliated Co-investigator or Key Personnel?  
   - [ ] Yes → Complete Appendix A

Page 1 of 4  
Revision 1.0
2. Are you requesting to modify or add External Co-Investigators or Key Personnel?  
☐ Yes → Complete Appendix B  
☐ No

3. Are you requesting a change in the Principal Investigator for this study?  
☐ Yes → Complete Appendix C  
☐ No

4. Will changes be made to, or include, any of the following? (check all that apply)  
☐ Blood drawing, injections, surgical procedures (including biopsies) → Complete Appendix D  
☐ Neonates (uncertain viability/nonviable) → Complete Appendix E

☐ Adults with decisional impairment → Complete Appendix F  
☐ Radiation (e.g., CT or DEXA scans, X-rays, nuclear medicine procedures) → Complete Appendix G

☐ Children → Complete Appendix H  
☐ Non-English speaking → Complete Appendix I  
☐ Data/Specimen storage/repository → Complete Appendix J

☐ (future unspecified use, including research databases for purposes of sharing data or specimens collected with other researchers/studies in the future)  
☐ Pregnant women/fetuses → Complete Appendix K

☐ Deception → Complete Appendix L & Appendix M  
☐ Prisoners → Complete Appendix N

☐ Devices → Complete Appendix O  
☐ Waiver/alteration of any/all of the basic elements of consent Complete Appendix P

☐ Drugs or biologics → Complete Appendix Q  
☐ Waiver of the requirement for participants to sign a consent document Complete Appendix R

☐ Genetic testing → Complete Appendix S  
☐ None Applicable

5. Does this request require the revision(s), addition(s), and/or deletion(s) to the following (check all that apply):  
☐ Consent Form(s), Assent Form(s), Permission Form(s), and Verbal Script(s) including translated documents  
☐ HIPAA Research Authorization Form(s)

☐ Recruitment Materials (e.g., ads, flyers, telephone or other oral script, radio/TV scripts, internet solicitations

☐ Script(s) or Information Sheet(s), including debriefing materials

☐ Instruments (e.g., questionnaires or surveys completed by participants)

☐ Other, Specify:

☐ Not applicable

For all items checked, provide:
AMENDMENT/CHANGE to RESEARCH

1. a copy of the revised materials, with change(s) underlined (or “tracked”) and

2. one copy with change(s) incorporated (clean).

Re-submission of the IRB Application for Initial Review of Human Subjects Research is not required.

Section III – DETAILS

1. Describe the change(s) to the research and provide a rationale for each change.

   1) Students receiving parental permission to participate in the study will receive a link to the survey
      via their school email account. School email account will be used to ensure that only those
      students with parental permission will have access to the survey link.

   2) Possible participant pool will include all middle and high school students in the district (up to
      1000 possible participants)

   3) One additional demographic question was included in the instrument asking students regarding
      student status (middle school student or high school student). This question will be added to more
      easily distinguish student status of the survey participants.

   4) The survey will be distributed to students in a different school district than the pilot study to avoid
      retesting the same population. (Chagrin Falls school district. Contact person: Superintendent Bob
      Hunt)

2. Will there be any change in the risk(s) to participants? ☐ Yes ☑ Explain below

   Explanation:

3. Will there be any change in the benefit(s) to participants? Compensation ☐ Yes ☑ Explain below

   Compensation is not to be considered a benefit.

   Explanation:

4. Could the proposed change(s) affect participants’ willingness to take part in the research?

   ☐ Yes ☑ No

   If Yes ➔ How will information be communicated to currently enrolled subjects (e.g., revised consent
   form, letter to participants, etc.)?

SECTION IV - PRINCIPAL INVESTIGATOR’S ASSURANCE

I agree to follow all applicable federal regulations, guidance, state and local laws, and university policies related to the protection
of human subjects in research, as well as professional practice standards and generally accepted good research practices for
investigators.

I verify that the information provided in this Amendment/Changes to Research form is accurate and complete. I will initiate
change(s) to this research only after having received notification of final IRB approval (unless necessary to eliminate apparent
immediate hazards to participants).

Signature of Principal Investigator ____________________________ Date ____________________________

Page 3 of 4 Revision 1.0
Research that involves CHILDREN

<table>
<thead>
<tr>
<th>INSTRUCTIONS for INVESTIGATORS:</th>
<th>IRB Office use only</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complete this form to request inclusion of participants who are</td>
<td></td>
</tr>
<tr>
<td>considered children</td>
<td></td>
</tr>
<tr>
<td>2. Submit this completed document with the Human Subjects Research</td>
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<tr>
<td>application via email attachment. To submit the form with a typed</td>
<td></td>
</tr>
<tr>
<td>signature, the form must be submitted from the Investigator's</td>
<td></td>
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<tr>
<td>@kent.edu email account. If completed form is signed and then</td>
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<tr>
<td>scanned as a PDF attachment, the @kent.edu email requirement does</td>
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<tr>
<td>not apply.</td>
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<tr>
<td>3. Do NOT begin data collection prior to receiving notification from</td>
<td></td>
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<tr>
<td>the KSU IRB that the IAAs agreement has been fully approved.</td>
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</tbody>
</table>

**DEFINITIONS**

**Children/Child** - Person(s) who have not attained the legal age for consent to treatments or procedures involved in the research, under the applicable law of the jurisdiction in which the research will be conducted.

**Minimal risk:**
The probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

To complete this form: **Single left-click to complete text fields. To check a box, double left-click on the box, then click “checked”. Click OK.**

**Section I - KSU Investigator Information**

Last Name: Ding  First Name: Kele

Title of Study (should match Human Subjects Research Application)

An Analysis of the impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior and Academic Achievement Among Middle and High School Students"

1. Select the category that best describes the research and provide the corresponding information:

   - ☑ Not greater than minimal risk → Go to Question #2
   - ☐ More than minimal risk is presented by an intervention or procedure that holds the prospect of direct benefit for the individual child, or by a monitoring procedure that is likely to contribute to the child’s well-being
   
   a. Explain how the risk is justified by the anticipated benefit to the individual child.
   
   b. Explain how the relation of the anticipated benefit to the risk is at least as favorable to the child as that which would be presented by available alternative approaches (e.g., other treatments).
More than minimal risk is presented by an intervention or procedure that does not hold the prospect of direct benefit for the individual child, or by a monitoring procedure that is not likely to contribute to the child's well-being.

a. Explain how the risk represents a minor increase over minimal risk.

b. Explain how the intervention or procedure presents experiences to children that are reasonably commensurate with those inherent in their actual or expected medical, dental, psychological, social, or educational situations.

c. Explain how the intervention or procedure is likely to yield generalizable knowledge about the child's disorder or condition that is of vital importance for the understanding or amelioration of the child's disorder or condition.

2. Explain the process of obtaining informed consent/assent from children and their parents (i.e., will parents and children be approached separately or together?).

Parental informed consent forms will be distributed by the first period class teacher to all middle and high school students in the school district. Students will be asked to gather parental permission and return the informed consent forms to the same teacher. An announcement will be sent to parents (via school parental portal) as a reminder to return the informed consent forms within one week. The teacher will submit the forms to the superintendent's office, where the investigator will collect them and store them in a locked cabinet at his Kent State University office. Those students who receive parental permission will be emailed (via school provided email) the link to the survey. The first page of the survey will contain the assent form (for those 12 years and below) or an informed consent (for those 13 years or older). Only once the student has clicked on "agree" to participate will they be given access to the survey.

3. Will the parents or guardians be present with the child during other discussions of the research? ☐ Yes ☐ No

4. Will incentives be offered to the research participants? ☐ Yes ☐ No

If Yes, complete the following:

a. Specify the incentives:

b. The incentives will be offered to: ☐ Child ☐ Parent

5. Will sensitive or private information (e.g., questionnaires, test results) be shared with the parents/guardians? ☐ Yes ☐ No

If Yes → Explain
6. If participation is to continue beyond the time that the child is 18 years of age, describe the process to be used to re-consent the participant.  □ N/A

7. Is there a possibility that any of the research participants will be wards of the State or any other agency or institution?  □ Yes  □ No
1. a copy of the revised materials, with change(s) underlined (or "tracked") and
2. one copy with change(s) incorporated (clean).
Re-submission of the IRB Application for Initial Review of Human Subjects Research is not required.

Section III - DETAILS
1. Describe the change(s) to the research and provide a rationale for each change.
   1) Students receiving parental permission to participate in the study will receive a link to the survey via their school email account. School email account will be used to ensure that only those students with parental permission will have access to the survey link.
   2) One additional demographic question was added to the instrument asking students regarding student status (middle school student or high school student). This question will be added to more easily distinguish student status of the survey participants.
   3) The survey will be distributed to students in a different school district than the pilot study to avoid retesting the same population.

2. Will there be any change in the risk(s) to participants? 
   □ Yes → Explain below
   □ No

Explanation:

3. Will there be any change in the benefit(s) to participants? Compensation is not to be considered a benefit.
   □ Yes → Explain below
   □ No

Explanation:

4. Could the proposed change(s) affect participants' willingness to take part in the research?
   □ Yes
   □ No

   If Yes → How will information be communicated to currently enrolled subjects (e.g., revised consent form, letter to participants, etc.)?

SECTION IV - PRINCIPAL INVESTIGATOR'S ASSURANCE
I agree to follow all applicable federal regulations, guidance, state and local laws, and university policies related to the protection of human subjects in research, as well as professional practice standards and generally accepted good research practices for investigators.

I verify that the information provided in this Amendment/Changes to Research form is accurate and complete. I will initiate change(s) to this research only after having received notification of final IRB approval (unless necessary to eliminate apparent immediate hazards to participants).

Keli Ding
Signature of Principal Investigator

KEIL DING
Printed name of Principal Investigator

10/6/13
Date

Page 3 of 4
Revision 1.0
The answers you give will be kept private. No one will know what you answer.

The next 5 questions ask about physical activity.

1. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
   A. 0 days
   B. 1 day
   C. 2 days
   D. 3 days
   E. 4 days
   F. 5 days
   G. 6 days
   H. 7 days

2. On an average school day, how many hours do you watch TV?
   A. I do not watch TV on an average school day
   B. Less than 1 hour per day
   C. 1 hour per day
   D. 2 hours per day
   E. 3 hours per day
   F. 4 hours per day
   G. 5 or more hours per day

3. On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Count time spent on things such as Xbox, PlayStation, an iPod, an iPad or other tablet, a smartphone, YouTube, Facebook or other social networking tools, and the Internet.)
   A. I do not play video or computer games or use a computer for something that is not school work
   B. Less than 1 hour per day
   C. 1 hour per day
   D. 2 hours per day
   E. 3 hours per day
   F. 4 hours per day
   G. 5 or more hours per day

4. In an average week when you are in school, on how many days do you go to physical education (PE) classes?
   A. 0 days
   B. 1 day
   C. 2 days
   D. 3 days
   E. 4 days
   F. 5 days
5. During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)
   A. 0 teams
   B. 1 team
   C. 2 teams
   D. 3 or more teams

The next 9 questions ask about food you ate or drank during the past 7 days. Think about all the meals and snacks you had from the time you got up until you went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

6. During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)
   A. I did not drink 100% fruit juice during the past 7 days
   B. 1 to 3 times during the past 7 days
   C. 4 to 6 times during the past 7 days
   D. 1 time per day
   E. 2 times per day
   F. 3 times per day
   G. 4 or more times per day

7. During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)
   A. I did not eat fruit during the past 7 days
   B. 1 to 3 times during the past 7 days
   C. 4 to 6 times during the past 7 days
   D. 1 time per day
   E. 2 times per day
   F. 3 times per day
   G. 4 or more times per day

8. During the past 7 days, how many times did you eat green salad?
   A. I did not eat green salad during the past 7 days
   B. 1 to 3 times during the past 7 days
   C. 4 to 6 times during the past 7 days
   D. 1 time per day
   E. 2 times per day
   F. 3 times per day
   G. 4 or more times per day

9. During the past 7 days, how many times did you eat potatoes? (Do not count french fries, fried potatoes, or potato chips.)
   A. I did not eat potatoes during the past 7 days
   B. 1 to 3 times during the past 7 days
   C. 4 to 6 times during the past 7 days
   D. 1 time per day
   E. 2 times per day
   F. 3 times per day
   G. 4 or more times per day
10. During the past 7 days, how many times did you eat carrots?
A. I did not eat carrots during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

11. During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)
A. I did not eat other vegetables during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

12. During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)
A. I did not drink soda or pop during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times per day
G. 4 or more times per day

13. During the past 7 days, how many glasses of milk did you drink? (Count the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)
A. I did not drink milk during the past 7 days
B. 1 to 3 glasses during the past 7 days
C. 4 to 6 glasses during the past 7 days
D. 1 glass per day
E. 2 glasses per day
F. 3 glasses per day
G. 4 or more glasses per day

14. During the past 7 days, on how many days did you eat breakfast?
A. 0 days
B. 1 day
C. 2 days
D. 3 days
E. 4 days
F. 5 days
G. 6 days
H. 7 days
15. Below is a list of things people might do or say to someone who is trying to exercise regularly. If you are not trying to exercise, then some of the questions may not apply to you, but please read and give an answer to every question.

<table>
<thead>
<tr>
<th>None</th>
<th>Rarely</th>
<th>a few times</th>
<th>often</th>
<th>very often</th>
<th>does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

During the past three months, my family (or members of my household):

1. Exercised with me.
2. Offered to exercise with me.
3. Gave me helpful reminders to exercise ("Are you going to exercise tonight?").
4. Gave me encouragement to stick with my exercise program.
5. Changed their schedule so we could exercise together.
6. Discussed exercise with me.
7. Complained about the time I spend exercising.
8. Criticized me or made fun of me for exercising.
9. Gave me rewards for exercising (bought me something or gave me something I like).
10. Planned for exercise on recreational outings.
11. Helped plan activities around my exercise.
12. Asked me for ideas on how they can get more exercise.
13. Talked about how much they like to exercise.

During the past three months, my friends:

1. Exercised with me.
2. Offered to exercise with me.
3. Gave me helpful reminders to exercise ("Are you going to exercise tonight?").
4. Gave me encouragement to stick with my exercise program.
5. Changed their schedule so we could exercise together.
6. Discussed exercise with me.
7. Complained about the time I spend exercising.
8. Criticized me or made fun of me for exercising.
9. Gave me rewards for exercising (bought me something or gave me something I like).
10. Planned for exercise on recreational outings.
11. Helped plan activities around my exercise.
12. Asked me for ideas on how they can get more exercise.
13. Talked about how much they like to exercise.
16. Below is a list of things people might do or say to someone who is trying to improve their eating habits. We are interested in high fat and high salt (or high sodium) foods. If you are not trying to make any of these dietary changes, then some of the questions may not apply to you, but please read and give an answer to every question.

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>Rarely</th>
<th>a few times</th>
<th>often</th>
<th>very often</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

During the past three months, my family (or members of my household):

<table>
<thead>
<tr>
<th></th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Encouraged me not to eat &quot;unhealthy foods&quot; (cake, salted chips) when I'm tempted to do so.</td>
<td></td>
</tr>
<tr>
<td>2. Discussed my eating habit, changes with me (asked me how I'm doing with my eating changes).</td>
<td></td>
</tr>
<tr>
<td>3. Reminded me not to eat high fat, high salt foods.</td>
<td></td>
</tr>
<tr>
<td>4. Complimented me on changing my eating habits (&quot;Keep it up&quot;, &quot;We are proud of you&quot;).</td>
<td></td>
</tr>
<tr>
<td>5. Commented if I went back to my old eating habits.</td>
<td></td>
</tr>
<tr>
<td>6. Ate high fat or high salt foods in front of me.</td>
<td></td>
</tr>
<tr>
<td>7. Refused to eat the same foods I eat.</td>
<td></td>
</tr>
<tr>
<td>8. Brought home foods I'm trying not to eat.</td>
<td></td>
</tr>
<tr>
<td>9. Got angry when I encouraged them to eat low salt, low fat foods.</td>
<td></td>
</tr>
<tr>
<td>10. Offered me food I'm trying not to eat.</td>
<td></td>
</tr>
</tbody>
</table>

During the past three months, my friends:

<table>
<thead>
<tr>
<th></th>
<th>Friends</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Encouraged me not to eat &quot;unhealthy foods&quot; (cake, salted chips) when I'm tempted to do so.</td>
<td></td>
</tr>
<tr>
<td>2. Discussed my eating habit, changes with me (asked me how I'm doing with my eating changes).</td>
<td></td>
</tr>
<tr>
<td>3. Reminded me not to eat high fat, high salt foods.</td>
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</tr>
<tr>
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</tr>
<tr>
<td>9. Got angry when I encouraged them to eat low salt, low fat foods.</td>
<td></td>
</tr>
<tr>
<td>10. Offered me food I'm trying not to eat.</td>
<td></td>
</tr>
</tbody>
</table>
17. How much does your school encourage you to eat healthy food?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>Some</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

18. How much does your school encourage you to be physically active?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>Some</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

19. During the past 12 months, how would you describe your grades in school?

A. Mostly A's  
B. Mostly B's  
C. Mostly C's  
D. Mostly D's  
E. Mostly F's  
F. None of these grades  
G. Not sure  

20. How old are you?

A. 10 years old or younger  
B. 11 years old  
C. 12 years old  
D. 13 years old  
E. 14 years old  
F. 15 years old  
G. 16 years old  
H. 17 years old  
I. 18 years old or older  

21. What is your sex?

A. Female  
B. Male  

22. Are you:

A. A high school student  
B. A middle school student
Informed Consent to Participate in a Research Study

**Study Title:** The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, and Academic Achievement among Middle and High School Students

Hello Parents,

Your child is being invited to participate in a research study. This consent form will provide you with information on the research project, what your child will need to do, and the associated risks and benefits of the research. Your child’s participation is voluntary. Please read this form carefully. It is important that you fully understand the research in order to make an informed decision. You may make a copy of this document for your records.

The purpose of this study is to investigate the impact of social support from family, friends and schools and selected demographics on middle school student’s physical activity, dietary behavior and academic achievement.

Your child will be asked to complete a web-based questionnaire. Participation in the study typically takes 20 minutes and is strictly anonymous. All responses are treated as confidential, and in no case will responses from individual participants be identified. Rather, all data will be pooled and published in aggregate form only. Participants should be aware; however, that the survey is not being run from a "secure" https server of the kind typically used to handle credit card transactions, so there is a small possibility that responses could be viewed by unauthorized third parties (e.g., computer hackers).

This research will not benefit you or your child directly. However, your child’s participation in this study will help us to better understand student’s perceptions regarding social support and how these link to physical activity and dietary behaviors as well as academic achievement. There are no anticipated risks beyond those encountered in everyday life.

Study data, and responses will not be linked to your child. Your child’s study related information will be kept confidential within the limits of the law. Any identifying information will be discarded and anonymously coded. Research participants will not be identified in any publication or presentation of research results; only aggregate data will be used. Participation or non-participation will have no effect on your child’s grade in the classroom.

Taking part in this research study is entirely up to you and your child. You and/or your child may choose not to participate or may discontinue their participation at any time without penalty or loss of benefits to which he/she is otherwise entitled. You will be informed of any new, relevant information that may affect your child’s health, welfare, or willingness to continue participation in this study.

If you have any questions or concerns about this research, you may contact Manuella Crawley at 440-313-2007 (mcrawle3@kent.edu) or Principal Investigator Dr. Kele Ding (kding@kent.edu) at 330-672-0688. This project has been approved by the Kent State University Institutional Review Board. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330.672.2704.
If you wish for your child to participate in this study, simply return this completed form to the school after selecting the “I wish for my child to participate in the study within one week” box, and return the completed form to the school within one week. You may print a copy of this document for your records. Please respond by ____________, 2013.

CONSENT STATEMENT

☐ I wish for my child to participate in this study

☐ I do not wish for my child to participate in this study

Parent Name: ____________________________ Relationship to student: ____________________________

Student Name: ____________________________ Student school email address: ____________________________

__________________________________________

Parent Signature

Sincerely,
Manuella Crawley, M.Ed.,CHES
Doctoral Candidate in Health Education and Health Promotion
Kent State University
Assent to Participate in a Research Study

Study Title: The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, and Academic Achievement among Middle and High School Students

Hello,

My name is Manuella Crawley, and I am trying to learn more about how you view the support you receive from your family, friends and your school and how that relates to you physical activity, what you eat and you achievement in school. I would like you to answer a few questions regarding this topic. Do you want to do this? If so follow the link below and complete the survey. This survey will take no more than 20 minutes of your time.

Thank you for participating in this survey,

Manuella Crawley, M.Ed., CHES
Doctoral Candidate in Health Education and Health Promotion
Kent State University
Mcrawle3@kent.edu
Informed Consent to Participate in a Research Study

**Study Title:** The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, and Academic Achievement among Middle and High School Students

Hello Students,

You are being invited to participate in a research study. This consent form will provide you with information on the research project, what you will need to do, and the associated risks and benefits of the research. Your participation is voluntary. Please read this form carefully. It is important that you fully understand the research in order to make an informed decision. You may print a copy of this document for your records.

The purpose of this study to investigate the impact of social support from family, friends and schools and selected demographics on middle school student’s physical activity, dietary behavior and academic achievement.

You will be asked to complete a web-based questionnaire. Participation in the study typically takes 20 minutes and is strictly anonymous. All responses are treated as confidential, and in no case will responses from individual participants be identified. Rather, all data will be pooled and published in aggregate form only. Participants should be aware; however, that the survey is not being run from a "secure" https server of the kind typically used to handle credit card transactions, so there is a small possibility that responses could be viewed by unauthorized third parties (e.g., computer hackers).

Your participation will require you to complete a web-based questionnaire. The questionnaire completion should take approximately twenty minutes.

This research will not benefit you directly. However, your participation in this study will help us to better understand student’s perceptions regarding social support and how these link to physical activity and dietary behaviors as well as academic achievement.

*There are no anticipated risks beyond those encountered in everyday life.*

Study data, and responses will not be linked to you. Your study related information will be kept confidential within the limits of the law. Any identifying information will be discarded and anonymously coded. Research participants will not be identified in any publication or presentation of research results; only aggregate data will be used.

Participation or non-participation will have no effect on your grade in the classroom.

Taking part in this research study is entirely up to you. You may choose not to participate or may discontinue their participation at any time without penalty or loss of benefits to which you are otherwise entitled. You will

The impact of Social Support and Selected Demographics on Physical Activity, Dietary Behavior, and Academic Achievement Among Middle and High School Students

Page 1 of 2
be informed of any new, relevant information that may affect your health, welfare, or willingness to continue participation in this study.

If you have any questions or concerns about this research, you may contact Manuella Crawley at 440-313-2007 (mcrawle3@kent.edu) or Principal Investigator Dr. Kele Ding (kdjing@kent.edu) at 330-672-0688. This project has been approved by the Kent State University Institutional Review Board. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330.672.2704.

I have read this consent form and I voluntarily agree to participate in this study. If you agree, please click on the “I agree” button below to start the survey.
Last week you received a form asking for you to assist us in investigating your child’s perceptions regarding physical activity, dietary behavior and social support by filling out a web-based survey. If you have already returned the Parental Consent form to the school, thank you!

If you have not had a chance to do so yet, I would appreciate your returning the completed form as soon as possible!

Thank you,
Manuella Crawley, M.Ed., CHES

Kent State University
Last week you received a form requesting for your assistance in investigating your child’s perceptions regarding physical activity, dietary behavior and social support by filling out a web-based survey! Please complete the parental consent form as soon as possible and return it to the school by Friday, ________, 2013.

Thank you,
Manuella Crawley, M.Ed., CHES
Kent State University
Last week you received an e-mail message asking you to assist us in investigating your perceptions regarding physical activity, dietary behavior and social support by filling out a web-based survey. If you have filled out the survey, thank you!

If you have not had a chance to take the survey yet, I would appreciate your reading the message below and completing the survey.

This message has gone to everyone in the selected sample population. Since no personal data is retained with the surveys for reasons of confidentiality, we are unable to identify whether or not you have already completed the survey. The survey link will be available until _____, 2013.

* If you 12 years old and younger take the web-based survey, by clicking on the following link:

*If you are 13 years or older, take the web-based survey, by clicking on the following link:

Thank you,
Manuella Crawley, M.Ed., CHES
Kent State University
**CITI Collaborative Institutional Training Initiative (CITI)**

**Responsible Conduct of Research Curriculum Completion Report**

**Printed on 5/13/2013**

**Learner:** Manuela Crawley (username: mcrawle3)  
**Institution:** Kent State University  
**Contact Information** Department: health education and health promotion  
Email: mcrawle3@kent.edu

**Social and Behavioral Responsible Conduct of Research Course I:** This course is for investigators, staff and students with an interest or focus in Social and Behavioral research. This course contains text, embedded case studies AND quizzes.

**Stage 1. Basic Course Passed on 10/14/09 (Ref # 3470219)**

<table>
<thead>
<tr>
<th>Required Modules</th>
<th>Date Completed</th>
<th>Score</th>
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<tr>
<td>The CITI Course in the Responsible Conduct of Research</td>
<td>10/13/09</td>
<td>no quiz</td>
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<tr>
<td>Introduction to the Responsible Conduct of Research</td>
<td>10/13/09</td>
<td>no quiz</td>
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<td>Introduction to Research Misconduct</td>
<td>10/13/09</td>
<td>no quiz</td>
</tr>
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<td>Research Misconduct</td>
<td>10/13/09</td>
<td>6/6 (100%)</td>
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<tr>
<td>Data Acquisition, Management, Sharing and Ownership</td>
<td>10/13/09</td>
<td>5/5 (100%)</td>
</tr>
<tr>
<td>Publication Practices and Responsible Authorship</td>
<td>10/13/09</td>
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<td>Peer Review</td>
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<td>Responsible Mentoring</td>
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<tr>
<td>Kent State University</td>
<td>10/13/09</td>
<td>no quiz</td>
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</table>

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator
CITI Collaborative Institutional Training Initiative

Social & Behavioral Research - Basic/Refresher Curriculum Completion Report
Printed on 5/13/2013

Learner: Manuela Crawley (username: mcrawle3)
Institution: Kent State University
Contact Information: Department: health education and health promotion
Email: mcrawle3@kent.edu

Social & Behavioral Research - Basic/Refresher: Choose this group to satisfy CITI training requirements for Investigators and staff involved primarily in Social/Behavioral Research with human subjects.

Stage 2. Refresher Course Passed on 05/12/13 (Ref # 8282601)

<table>
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<tr>
<th>Required Modules</th>
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<tr>
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<tr>
<td>SBE Refresher 1 – Privacy and Confidentiality</td>
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<tr>
<td>SBE Refresher 1 – Assessing Risk</td>
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<tr>
<td>SBE Refresher 1 – Research with Children</td>
<td>05/12/13</td>
<td>2/2 (100%)</td>
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<tr>
<td>SBE Refresher 1 – International Research</td>
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<tr>
<td>SBE Refresher 2 – Research with Children</td>
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<tr>
<td>SBE Refresher 2 – Research in the Public Schools</td>
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<tr>
<td>SBE Refresher 2 – International Research</td>
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<tr>
<td>SBE Refresher 1 – History and Ethical Principles</td>
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<tr>
<td>SBE Refresher 1 – Federal Regulations for Protecting Research Subjects</td>
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<td>2/2 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 1 – Informed Consent</td>
<td>05/12/13</td>
<td>2/2 (100%)</td>
</tr>
<tr>
<td>SBE Refresher 1 – Research with Prisoners</td>
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<tr>
<td>SBE Refresher 1 – Research in Educational Settings</td>
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<tr>
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### Completion of the SBR 201 Refresher Course

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<tr>
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<th>Score</th>
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</thead>
<tbody>
<tr>
<td>SBE Refresher 2 – Informed Consent</td>
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</tr>
<tr>
<td>SBE Refresher 2 – Privacy and Confidentiality</td>
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<td>1/1 (100%)</td>
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<td>SBE Refresher 2 – Assessing Risk</td>
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Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

[Return]
APPENDIX G

STUDY IRB APPROVAL
Appendix G

Study IRB Approval

FW: IRB approval for MODIFICATION(S) (protocol #13-290) - retain this email for your records
8 messages

From: Richmond, Aleene On Behalf Of RAGS Research Compliance
Sent: Thursday, December 19, 2013 12:27 PM
To: DING, KELE
Subject: IRB approval for MODIFICATION(S) (protocol #13-290) - retain this email for your records

RE: IRB # 13-290 entitled "An Analysis of the impact of social support and selected demographics on physical activity, dietary behavior, and academic achievement among middle and high school students"

Hello,

The Kent State University Institutional Review Board (IRB) has reviewed and approved your protocol amendment/change request. It is understood that the research is continuing with modifications including email survey links to school email accounts, to include all middle and high school students, new demographics question, and to recruit at Chagrin Falls. The modification to this protocol was approved on December 19, 2013.

*If applicable, a copy of the IRB approved consent form is attached to this email. This “stamped” copy is the consent form that you must use for your research participants. It is important for you to also keep an unstamped text copy (i.e., Microsoft Word version) of your consent form for subsequent submissions. Note that if you are conducting an online study the stamped consent form is only for record keeping purposes.

Federal regulations and Kent State University IRB policy requires that research be reviewed at intervals appropriate to the degree of risk, but not less than once per year.

**REMINDER: The annual review for this protocol is due prior to the expiration date of August 15, 2014.**
HHS regulations and Kent State University Institutional Review Board guidelines require that any changes in research methodology, protocol design, or principal investigator have the prior approval of the IRB before implementation and continuation of the protocol. The IRB must also be informed of any adverse events associated with the study. The IRB further requests a final report at the conclusion of the study.

Kent State University has a Federal Wide Assurance on file with the Office for Human Research Protections (OHRP); FWA Number 00000183.

If you have any questions or concerns, please contact us at Research.compliance@kent.edu or by phone at 330-672-2944 or 330-672-8058.

Thank you.

Respectfully,
Kent State University Office of Research Compliance
224 Cartwright Hall | fax 330.672.2658

Kevin McCreary | Research Compliance Coordinator | 330.672.8058 | kmccrea18@kent.edu
Paula R. Washko | Manager, Research Compliance | 330.672.2754 | Pawashko@kent.edu

For links to obtain general information, access forms, and complete required training, visit our website at www.kent.edu/research.
REFERENCES
REFERENCES


Basch, C. E. (2010). Healthier students are better learners: A missing link in school reforms to close the achievement gap. *Equity Matters: Research Review No. 6.*


Reed, J. A., Einstein, G., Hahn, E., Hooker, S. P., Gross, V. P., & Kravitz, J. (2010). Examining the impact of integrating physical activity on fluid intelligence and
academic performance in an elementary school setting: a preliminary investigation. *Journal of Physical Activity and Health, 7*(3), 343-351.


http://schoolwellnesspolicies.org/resources/Section204LocalWellnessPolicies.pdf

http://www.govtrack.us/congress/bills/106/s1159


http://www.fns.usda.gov/child-nutrition-programs


