ABSTRACT

ASSESSMENT OF HOW INTERNALIZED FORMS OF MOTIVATION MEDIATE THE RELATIONSHIP BETWEEN SUPPORTS FOR BASIC PSYCHOLOGICAL NEEDS AND PHYSICAL ACTIVITY BEHAVIORS

by

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The prevalence of obesity has increased steadily over the last 30 years and it is a growing concern for school, health and recreation providers. Decreases in time spent in physical activity and increased participation in sedentary activities are linked to the steady rise of obese and overweight youth (Rossner, 2002). Guided by Self-Determination Theory (Deci & Ryan, 2000), the purpose of this study was to examine how supports for the basic psychological needs of autonomy, competence and relatedness are related to the performance of physical activity behaviors among youth. This study specifically examined how intrinsic motivation mediates the relationship between supports for basic psychological needs and performance of physical activity behaviors. The study acquired data from a rural county school district in eastern North Carolina. School administrators collected responses from 115 students attending grades 6-10 using electronic questionnaires. Data were collected as part of an on-going community health initiative aimed at increasing physical activity within the county. Physical activity participation was measured using the Physical Activity Questionnaire for Children (PAC-Q), while measures for motivation and support of basic psychological needs came from a study conducted by Ntoumanis

(2001). Results demonstrate the importance of perceived competence in the support for intrinsic motivation, and the indirect effect of perceived competence on physical activity participation. The discussion reviews the results in the context of the literature, and emphasizes the need to support competence in programs designed for early adolescents.

ASSESSMENT OF HOW INTERNALIZED FORMS OF MOTIVATION MEDIATE THE RELATIONSHIP BETWEEN SUPPORTS FOR BASIC PSYCHOLOGICAL NEEDS AND PHYSICAL ACTIVITY BEHAVIORS

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CHAPTER I: INTRODUCTION

The prevalence of obesity has increased steadily over the last 30 years (Dixon, 2009). Obesity in the United States is a significant health problem among youth (Power, Bindler, Goetz, & Daratha, 2010). Health statistics demonstrate that 17% of youth are categorized as overweight and another 16% are at risk for becoming overweight (Power et al., 2010). Overweight and obesity in youth are major public health concerns, as many youth suffer from weight-related disease and illness in adulthood. Obesity is associated with type 2 diabetes, hypertension, dyslipidemia, stroke, heart disease, osteoarthritis, gallbladder disease, certain cancers, and premature death (Rooney, Schauberger, & Mathiason, 2005). Unhealthy habits related to exercise and nutrition in adolescence have exacerbated these types of chronic diseases in early adulthood (Rooney et al., 2005). Issues related to overweight and obesity can be traced in part to the high prevalence of sedentary lifestyles (Rossner, 2002).

Sedentary behavior refers to activities that do not increase energy expenditure (Pate, O'Neill, & Lobelo, 2008). Examples of sedentary behaviors are sleeping, sitting, watching television and playing video games (Rossner, 2002). It is estimated that youth spend 26 hours a week watching television (Rossner, 2002). Physical activity among youth is decreasing because of sedentary behaviors. Technology has replaced physical activity pursuits thereby removing the benefits of physical activity for youth (Rossner, 2002).

Physical activity provides adolescents with opportunities to explore environments and develop motor skills (Batch & Baur, 2005). Adolescents that are physically active decrease their chances of suffering from weight related chronic diseases (Batch & Baur, 2005). The ability to internalize the importance of being physically active helps adolescents enjoy a better quality of life.

Advocates of Self-Determination Theory suggest that the process of internalization is important to adopting and participating in new behaviors (Deci & Ryan, 2002). Internalization is a process by which one learns to value or identify with an activity that was previously performed for an external reason (e.g., to gain rewards, avoid punishment). Youth are more likely to participate in physical activity if they learn to internalize the benefits of physical activity through educational programs offered outside of school time (Veugelers & Fitzgerald, 2005). Programs are most successful in promoting internalization when supports for the basic psychological needs of autonomy, competence, and relatedness exist (Ryan & Deci, 2000). It follows then that programmers need to understand how and to what extent these needs are supported and subsequently, have a positive impact on physical activity behavior.

Conversely, when psychological needs are not met, reports of being controlled or going along with activities for unspecified reasons are linked to amotivation (Ryan & Deci, 2000). Amotivation is detrimental to the adoption of new behaviors, and can seriously undermine developmental progress (Watts & Caldwell, 2008). Programmers need to identify those situations that youth feel are beyond their control, and work to promote unmet psychological needs. Figure 1 depicts a working model of behavioral performance based on Self-Determination Theory.

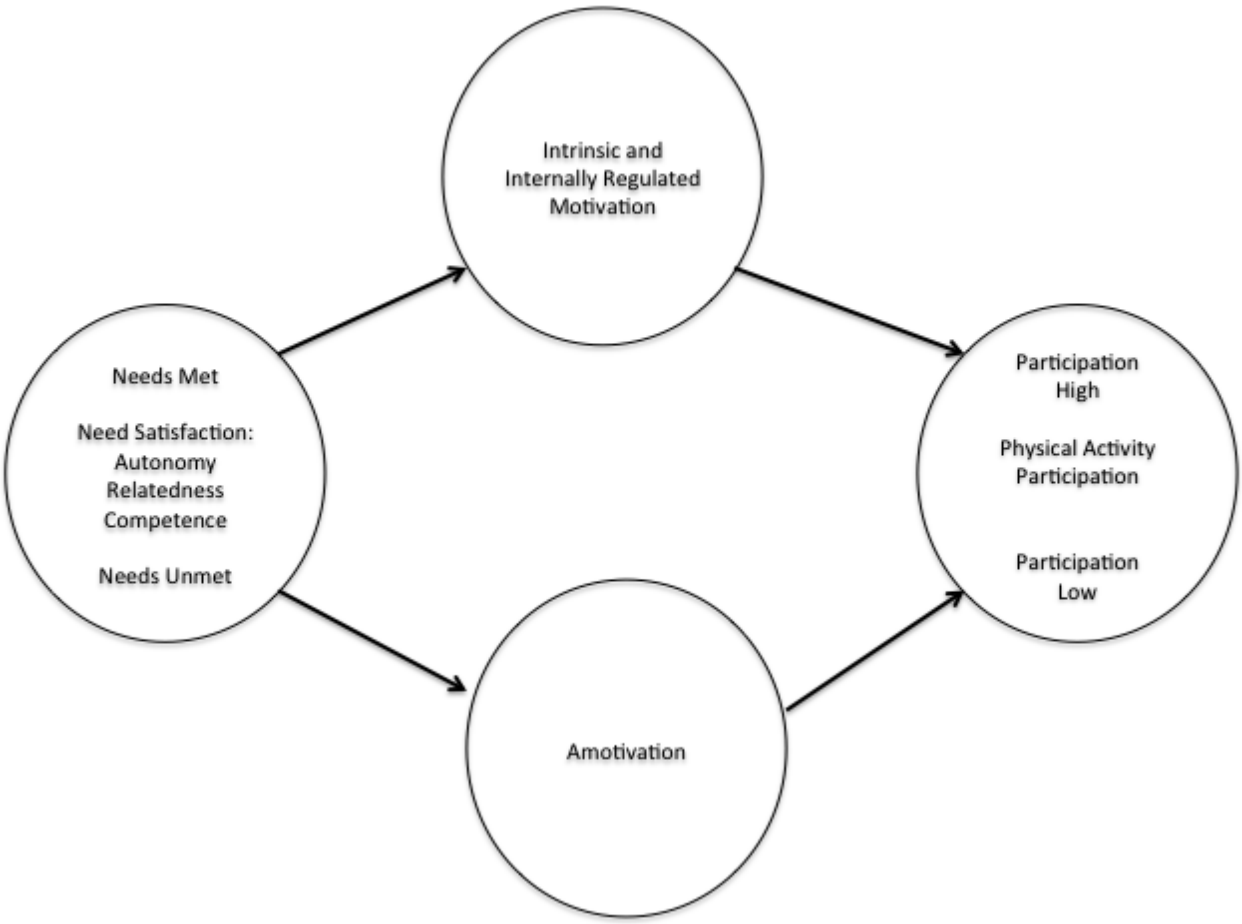

Figure 1. Mediating model demonstrating how self-determination theory explains behavioral engagement in physical activity.

In this model, the effect of needs satisfaction (autonomy, competence and relatedness) on physical activity participation is mediated by motivation to participate in physical activity. Simply put self-determined behavior or internalized motivation states occur when the needs for autonomy (i.e., the existence of choices), competence (i.e., feeling capable to perform a task), and relatedness (i.e., connectedness to others) are supported (Cox, Smith, & Williams, 2008).

Internalized motivation states are those occurrences where motivation is based on inherent satisfaction or appeal of an activity, or related to regulation of behavior because it is congruent with some adopted value or goal (Ryan & Deci, 2000). Internalized motivation leads to activity adoption. Basic needs satisfaction plays an important role in supporting internal motivation states (i.e., intrinsic motivation or internally regulated motivation). When these basic needs are satisfied, internal motivation is supported. For the purposes of this paper, internal motivation spurs physical activity participation. For youth, supporting basic needs in contexts where physical activity is encouraged (i.e., physical education classes, sports, fitness classes) leads to behavioral adoption, as well as the adoption of values and beliefs about the importance of physical activity (Teixeira, Carraca, Markland, Silva, & Ryan, 2012). When basic psychological needs are unmet or not supported, amotivation with respect to physical activity occurs, and behavioral performance is low (Teixeira et al., 2012). Programs seeking to impact physical activity behavior need to understand what supports exist within education and after school programs, and to what extent these supports are linked to facilitating internalized motivation states, and more importantly, physical activity participation.

Statement of the Problem

There is a growing concern about obesity in early and middle adolescence. Physical activity participation among adolescents is growing because leisure time is often occupied by sedentary activities such as playing video games and watching television (Rossner, 2002). This growth in sedentary activity participation is linked to unhealthy lifestyles and fostering ailments that can be harmful throughout one's lifetime.

A major problem facing adolescents is learning to internalize the benefits of being physically active. This study examines the extent to which youths' basic psychological needs

(i.e, relatedness, competence, and autonomy) are satisfied, how variations in support of these needs influence motivation to participate in physically active behavior, and the extent to which motivation predicts physical activity participation.

Purpose Statement

The purpose of this study is to examine how supports for autonomy, relatedness and competence are associated with the performance of physical activity behaviors among youth. This study examined specifically how intrinsic motivation mediates the relationship between supports for basic psychological needs and performance of physical activity behaviors. Deci and Ryan's (2000) Self -Determination Theory serves as the theoretical framework for this study. Adolescents from grades 6-10 from a remote, rural county in eastern North Carolina were recruited to participate in this study. Data were collected through an electronic questionnaire designed to assess baseline physical activity levels of students, and administered by school officials.

Hypotheses

1. Perceptions of need satisfaction will be positively related to intrinsic motivation for physical activity participation.
2. Perceptions of need satisfaction will be positively related to amotivation for physical activity participation.
3. Intrinsic motivation for physical activity participation will be positively related to physical activity behavior.
4. Amotivation for physical activity participation will be negatively related to physical activity behavior.

5. The relationship between needs satisfaction and physical activity behavior will be mediated by intrinsic motivation for physical activity participation.

Null Hypotheses

1. There is no relationship between perceptions of need satisfaction and intrinsic motivation for physical activity participation.
2. There is no relationship between perceptions of need satisfaction and amotivation for physical activity participation.
3. There is no relationship between internalized motivation to participate in physical activity and physical activity behavior.
4. There is no relationship between amotivation to participate in physical activity and physical activity behavior.
5. There is no mediating function of intrinsic motivation in the relationship between needs satisfaction and physical activity behavior.

Research Objectives

1. Examine the relationship between basic needs satisfaction (i.e., autonomy, competence and relatedness) and intrinsic motivation.
2. Examine the relationship between basic needs satisfaction (i.e., autonomy, competence and relatedness) and the amotivation state.
3. Examine the relationship between intrinsic motivation and physical activity participation.
4. Examine the relationship between amotivation and physical activity participation.
5. Examine how intrinsic motivation mediates the effects of basic needs satisfaction on physical activity participation.

Limitations

Measuring intrinsic motivation is a difficult task because motivation is a dynamic state and often varies over time. The current study proposes a cross-sectional data collection strategy, which limits the ability to detect variation in motivation. Furthermore, the study cannot isolate effects related to seasonal variations in behavior or account for the effect of interventions currently in place to support physical activity behaviors. The study also utilizes a scale to assess motivation types (Goudas, Biddle, & Fox, 1994; Ntoumanis, 2001). While the scale has established acceptable criteria for reliability and validity, it has not been utilized extensively with youth from diverse backgrounds. As such, scales will be examined for differences with respect to race and ethnicity. This study also uses a convenience sample of participants from afterschool programs offered in a remote, rural county. Results from this study cannot be generalized beyond the sample.

Delimitations

This study was limited to adolescents attending the Mattamuskeet Middle and High Schools in Hyde County. This study was also delimited by the school grade level (grades 6-10) of the participants in the study.

Assumptions

The researcher assumes that all participants will answer the questions honestly. The study assumes that all participants understood the questionnaire, and that the questionnaire was at the appropriate reading level for the students sampled. Several precautions were implemented to ensure that these assumptions would not be violated. All study measures have been used in past studies with adolescents. In addition to using age appropriate measures, the electronic questionnaires were completed with a teacher, and often times, a teaching assistant who assisted

students with reading or answering questions students may have with respect to the questionnaire.

Definition of Terms

Adolescence: is the time between the beginning of sexual maturation (puberty) and adulthood. It is a time of psychological maturation, during which a person becomes "adult-like" in behavior. Adolescence is roughly considered to be the period between 13 and 19 years of age. The adolescent experiences not only physical growth and change but also emotional, psychological, social change and growth (Watts & Cremeens, 2011). Students in this sample ranged between the ages of 11-17 years of age with the preponderance of the sample being between ages 12-14.

Amotivation: where an individual lacks the desire or intention to act. Amotivated, they participate without intention or act passively towards the activity (Deci & Ryan, 2002).

Autonomy: refers to being the perceived origin or source of one's own behavior (Deci & Ryan, 2002).

Cognitive Evaluation Theory (CET): is used to describe the effects of social contexts on people's intrinsic motivation.

Competence: refers to feeling effective in one's ongoing interactions with the social environment and experiencing opportunities to exercise and express one's capacities (Deci & Ryan, 2002).

Duration: refers to amount of time spent on a physical activity (Blair, Kohl, Gordon, & Paffenbarger, 1992).

Frequency: refers to how often the exercise is performed on a weekly basis.

Intensity: generally viewed as a way to stimulate and improve physical fitness based on the amount of oxygen uptake (Blair et al., 1992).

Internalization: is a process under which externally motivated behavior gradually is performed for reasons internal to the self. This process occurs as individuals learn to identify with a behavior or find alignment between the behavior and personal goals and values (Deci & Ryan, 2002).

Needs satisfaction: the presence and adequate support for the basic needs of autonomy, competence and relatedness, innate requirements evident in all cultures and in all developmental periods (Deci & Ryan, 2002).

Organismic Integration Theory (OIT): concerns internalization and integration of values and regulations to the self. OIT explains the process of internalization (Deci & Ryan, 2002).

Obesity: having a Body Mass Index of 30 or higher (Department of Health and Human Services, 2010).

Physical activity: is defined as "any bodily movement produced by the skeletal muscles that results in energy expenditure" (Blair et al., 1992, 100).

Physical inactivity: is not engaging in any regular pattern of physical activity beyond daily functioning (Bull, Armstrong, Dixon, Ham, Neiman, & Pratt, 2004).

Relatedness: refers to feeling connected to others, caring for and being cared for by those others and having a sense of belongingness both with other individuals and within a community (Deci & Ryan, 2002).

Sedentary behavior: refers to activities that do not increase energy expenditure (Pate, O'Neill, & Lobelo, 2008).

Sedentary lifestyle: is defined as being physically inactive at work and at home and failing to participate in exercise for at least 20 continuous minutes at least three times a week (Department of Health and Human Services, 2010).

CHAPTER II: LITERATURE REVIEW

This chapter presents an overview to support the study of how basic needs satisfaction (i.e., autonomy, relatedness, and competence) leads to self-determined behavioral performance of physical activity. Section one provides an overview of obesity in childhood and adolescence. Section two provides an overview of the developmental period from late childhood to early adolescence. Section three provides an overview of physical activity in childhood and adolescence. Section four provides an overview of the Self-Determination Theory.

Obesity

Overweight and obesity affects Americans of all ages, sexes, ethnic groups, and educational levels (Department of Health and Human Services, 2010). The incidence of overweight and obesity has increased substantially in the United States since 1980 (Department of Health and Human Services, 2010). Obesity in the United States is a significant health problem among youth (Power, Bindler, Goetz, & Daratha, 2010), and is associated with type 2 diabetes, hypertension, dyslipidemia, stroke, heart disease, osteoarthritis, gallbladder disease, certain cancers, and premature death (Rooney, Schauberger, & Mathiason, 2005). According to Mokdad, Bowman, Ford, Vinicor, Marks, and Koplan (2001), "obesity also increases morbidity and impairs quality of life" (p. 1195). The rise of obesity as significant public health problem is linked to an increasing number of individuals who fail to participate in regular, adequate physical activity and engage in sedentary lifestyles (Cliff, Okely, Morgan, Jones, & Steele, 2009).

Obesity is described as a disorder of excess body fatness that is associated with increased risk for chronic diseases (World Health Organization, 2000). Obesity is caused by a lack of energy balance (Department of Health and Human Services, 2010). Energy balance means energy "IN" equals energy "OUT" (Department of Health and Human Services, 2010). Energy

"IN" is the amount of calories one gets from food and drinks (Department of Health and Human Services, 2010). Energy "OUT" is the amount of energy one's body uses for daily tasks (Department of Health and Human Services, 2010). Balancing energy "IN" and energy "OUT" is important to maintaining a healthy weight (Department of Health and Human Services, 2010). Other causes of overweight and obesity are sedentary behavior, environment, genetics, and health conditions.

Obesity is measured by Body Mass Index (BMI). BMI is a number calculated from a person's weight and height (Ogden & Carroll, 2010). BMI does not measure body fat directly but is a reliable indicator of body fatness (Gallagher, Visser, Sepúlveda, Pierson, Harris, & Heymsfield, 1996). The percentage of children and adolescents with BMI levels indicating obesity has steadily increased over the past three decades (Ogden & Carroll, 2010). According to the Ogden and Carroll (2010), adolescents classified as at a healthy weight are those individuals whose BMI falls between the 5^{th} and 85^{th} percentile. There is not a set percentage of body fat for children and adolescents, as the amount of body fat changes with age. For this reason, BMI for children and teens is referred to as BMI-for-age (Ogden & Carroll, 2010). Obesity is discussed in terms of BMI-for-age until youth reach age 20 (Ogden & Carroll, 2010).

Obesity in Childhood and Adolescence

Obesity in adolescence is becoming a significant public health issue (Cliff et al., 2009). Prior to 1980, overweight and obesity among children and adolescents was six percent (Lawrence, Hazlett, & Hightower, 2010). These percentages are three times higher in today's society. Around 19 percent of school-age children and 17 percent of adolescents are overweight or at risk for obesity (Department of Health and Human Services, 2010). Overweight and obesity are major public health concerns, as many youth suffer from weight-related chronic

disease (e.g., cardiovascular disease, diabetes) into adulthood. Unhealthy habits developed in childhood and adolescence, and are later linked to these diseases in early adulthood (Rooney, Schauberger, & Mathiason, 2005).

Physical inactivity can increase the risk of cardiovascular diseases. Physical inactivity is not engaging in any regular pattern of physical activity beyond daily functioning (Bull, Armstrong, Dixon, Ham, Neiman, & Pratt, 2004). There are a variety of chronic diseases that can result from physical inactivity. Cancer (colon and breast), diabetes, obesity, hypertension, osteoporosis, osteoarthritis, and depression are all linked to sedentary behavior and a lack of physical activity. More alarming, the percentage of children and adolescents with a chronic health condition has more than tripled since the 1960s (Centers for Disease Control and Prevention, 2009). Currently, more than 75% of health costs are related to the treatment of chronic health conditions (Centers for Disease Control and Prevention, 2009). Encouraging physical activity during childhood and adolescence can help ward off these diseases and promote health and wellness within the youth population.

The Developmental Period of Adolescence

Adolescence is the stage between childhood and adulthood. Adolescence is roughly considered to be the period between 13 and 19 years of age. Changes that occur in girls include breast development, appearance of hair around the genital area and underarms, and menstruating. Changes that occur in boys are appearance of hair growth around the genital area and underarms, facial hair growth, and development of the sexual reproductive organs (Watts & Cremeens, 2011). Early adolescence is where children begin to go through puberty. Puberty refers to when boys and girls become capable for reproduction. Children also experience physical and mental growth during this period.

Adolescence is the time between the beginning of sexual maturation (puberty) and adulthood. It is a time of psychological maturation, during which a person becomes "adult-like" in behavior. Physical, emotional, psychological, and social growth occurs during the adolescent stage (Watts & Cremeens, 2011). Being physically active during adolescence is important because it can lead to life-long participation and healthier individual (Watts & Cremeens, 2011).

Leisure and Adolescence

When considering adolescence, leisure is often referred to as a time for risk and opportunity (Carnegie Council on Adolescent Development, 1992). As children mature into adolescents, they are given more freedom to choose their activities and make decisions about how to use their free time (Watts & Cremeens, 2011). Adolescents spend nearly half of their waking hours in free time or leisure pursuits (Larson & Seepersad, 2003). Activities that are adult-supervised and structured are often linked with positive developmental and health outcomes (Watts & Cremeens, 2011). These offer opportunities for youth to connect with pro-social peers and adults who serve as appropriate role models. However, the vast percentage of adolescents' free time is spent in unsupervised, social situations with peers or in "screen time" (e.g., television, videogames, computer use) activities (Gordon-Larsen, Nelson, & Popkin, 2004; Larson & Seepersad).

Over the last three decades, leisure among adolescents has become more sedentary in nature (Gordon-Larsen, Nelson, & Popkin). Sedentary activities among males and females include watching television, browsing the internet, playing video games, reading, studying, and completing homework (Liou, Liou, Chang, 2010). It is estimated that youth spend 26 hours a week watching television (Rossner, 2002). Technology has replaced physical activity pursuits thereby removing the benefits of physical activity for youth (Rossner, 2002).

Physical Activity

Physical activity habits established early in life may persist into lifelong participation (Sallis et al., 1992). Physical activity is defined as "any bodily movement produced by the skeletal muscles that result in energy expenditure" (Blair, Kohl, Gordon, & Paffenbarger, 1992, p. 100). Physical activity in adolescence helps in the development of the central nervous system and coordination (Sallis et al., 1992), and "improves or maintains one or more components of physical fitness" (Blair et al., 1992, p.101). Early exercise for adolescence has health benefits such as fighting off obesity and coronary heart disease (Sallis, et al., 1992). Blair et al. (1992) identify three principles of exercise: intensity, duration, and frequency.

Intensity in physical activity is generally viewed as a way to stimulate and improve physical fitness based on the amount of oxygen uptake (Blair et al.). Intensity may also vary on the fitness level of the participant, duration of the exercise, length of training period, and characteristics of the participants (Blair et al.). *Duration* refers to amount of time spent on a physical activity (Blair et al.). *Frequency* refers to how often exercising occurs. Exercising at an appropriate frequency helps maintain and improve one's health. Guidelines from the Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) recommend 30 minutes of moderate physical activity on at least five days a week (Pate et al., 1995). It is also recommended that TV and video viewing and computer/video game use is limited to less than three hours a day (American Academy of Pediatrics Committee on Public Education, 2001).

Physical Activity in Childhood and Adolescence

Regular physical activity is one of the most important things an individual can do to improve their health (Ogden & Carroll, 2010). Physical activity provides children and

adolescents with opportunities to explore environments and develop motor skills (Batch & Baur, 2005). Youth that are physically active decrease their chances of suffering from weight-related chronic diseases (Batch & Baur, 2005). Physical activity helps reduce risk of cardiovascular diseases, type 2 diabetes, and some cancers (Ogden & Carroll, 2010). Physical activity strengthens bones and muscles, improves mental health, and increases chances of living longer (Ogden & Carroll 2010). Adolescents participating frequently in physical activities can improve their quality of life.

Adolescents participate in several physical activities. Male adolescents are more likely to participate in intense physical sports like football, baseball, basketball, street hockey, and weight lifting (Aaron, Storti, Robertson, Krisha, LaPorte, 2002). Female adolescents are more likely to participate in aerobics and softball (Aaron et al., 2002). Engaging in regular physical activity is a lifelong positive behavior that should be a developmental goal of adolescence (Kohl III & Hobbs, 1998). There are three potential behavioral determinants related to physical activity participation: (1) physiological and developmental factors; (2) environmental factors; and (3) psychological, social and demographic factors (Kohl III & Hobbs, 1998).

Physiological and Developmental Factors Influence PA Participation

Most literature on growth and maturation states that physical activity has a positive effect on overall development (Kohl III & Hobbs, 1998). Active children usually score higher on physical fitness tests when compared to inactive children, and have fewer issues related to chronic disease (Kohl III & Hobbs, 1998). Gender, cardiorespiratory fitness, overall physical fitness all play a role in the extent to which youth participate in regular physical activity.

Gender is a major determinant in physical activity participation. Boys are nearly twice as active as girls in physical activities (Kohl III & Hobbs, 1998). Reasons for this gender difference

focus on the development of different motor skills, differences in body composition, and greater socialization towards sports. Cardiorespiratory fitness is another factor that can be a determinant to physical activity. Aerobic power is often a vital component to participating in regular exercise during adolescence, as Kohl III and Hobbs (1998) explain, "aerobic power responds to increased physical activity, especially during the pre-pubertal years" (p.550). The dependence on cardiorespiratory fitness draws attention to physical health, which is the last determinant affecting physical activity participation in adolescents (Kohl III & Hobbs, 1998). For some children and adolescents, poor physical health undermines regular, moderate to vigorous physical activity participation.

Environmental Factors

Physical environments can have a major influence on adolescents' level of physical activity. Physical environments can be categorized into time and place factors (Sallis et al., 1992). Key time and place factors affecting the physical activity of youth are schools, seasonal and geographic variations, and access to facilities (Sallis et al., 1992).

Most adolescents attend school; and "schools play a major role in increasing physical activity levels" (Kohl III & Hobbs, 1998, p. 551). Physical activities among adolescents decline with grade level and age (Kohl III & Hobbs, 1998). Kohl III and Hobbs (1998) note that physical activities in schools are becoming less important, and often, fewer opportunities for sport exist as children age. Declining physical activities in schools can have a major effect on the cardiovascular health of youth.

Seasonal and geographic influences play a role in determining physical activity behaviors. According to Kohl III and Hobbs (1998), adolescents are more active in the summer

time than the winter due to the inclement weather associated with winter. Adolescences that live in towns and cities with milder winters are often more active (Kohl III & Hobbs, 1998).

Physical activity facilities are the third environmental factor. Often times, adolescent physical activities take place in organized programs outside of school (Sallis et al, 1992.). YMCA's, recreation centers, and gyms are examples of where adolescents may engage in physical activities. Physical activity participation decreases when there are limited facilities within a community. Coupled with the reduction in opportunities, communities that have fewer opportunities for organized sports and facilities are those most at-risk for a sedentary adolescent population.

Psychological, Social and Demographic Factors

A variety of psychological, social, and demographic factors are linked to physical activity participation by adolescents. Variables for psychological factors are defined differently by different studies. Possible determinants of physical activity are self-efficacy, health beliefs, parents, peers, and education.

Self-efficacy refers to the confidence an individual has to change or maintain a certain action or behavior (Kohl III & Hobbs, 1998). Self-efficacy helps predict adolescents' weekly physical activity participation (Kohl III & Hobbs, 1998). Feeling efficacious in physical activity is aligned with intentions to participate and life-long physical activity (Kohl III & Hobbs, 1998).

Health beliefs are perceived benefits and risks that are evaluated before engaging in physical activity (Kohl III & Hobbs, 1998). Long-term engagement in physical activity occurs when youth learn to internalize the benefits of activities (Teixeira, Carraca, Markland, Silva, & Ryan, 2012). Risks may take the form of actual risks (e.g., some element of danger) or risks to other behaviors and activities of more value to the developing adolescent. Lack of time, lack of

interest, weather, availability of friends, and access to facilities are possible determinants of why physical activity is decreasing among adolescents (Kohl III & Hobbs, 1998).

Interpersonal resources (i.e., parents, peers) in the microsystem might also explain why adolescents engage in physical activity (Watts & Cremeens, 2011). Parents may either facilitate experiences through the provision of resources or serve as an example from which to base norms for physical activity participation (Kohl III & Hobbs, 1998; Watts & Cremeens, 2011). For example, adolescents who have physically active parents, tend to be more physically active themselves (Kohl III & Hobbs, 1998). Parents can encourage physical activities within adolescents, and often emphasize expectations or provide resources (e.g., money, transportation) to support physical activity (Watts & Caldwell, 2008).

Peers are also determinants for physical activity. Peers influence and encourage physical activity among each other. Physically active youth often have friends who are as well. These like-minded peers may help increase adolescent physical activity participation (Kohl III & Hobbs, 1998; Watts & Cremeens, 2011). Positive social networks can improve how adolescents feel about participating in physical activities.

Education is a determinant for physical activity because it teaches adolescents the importance of being active (Teixeira, Carraca, Markland, Silva, & Ryan, 2012). Adolescents can be educated about the chronic diseases associated with overweight and obesity, but also provided opportunities to value and realize the benefit of physical activity to their overall quality of life (Watts & Cremeens, 2011). Knowledge about the benefits of physical activity may encourage youth to be more active.

Self-Determination Theory

Self-Determination Theory (SDT) is useful in understanding what motivates adolescents to participate and continue participation in long-term physical activity. SDT embraces the assumption that all individuals have natural, innate, and constructive tendencies to develop an elaborate sense of self (Deci & Ryan, 2002). SDT suggest that the process of internalization is important to adopting and participating in new behaviors (Deci & Ryan, 2002; Watts & Caldwell, 2008). Participants are more likely to participate in physical activity if they learn to internalize the benefits of being physically active (Veugelers & Fitzgerald, 2005). Programs are most successful in promoting internalization when supports for the basic psychological needs of autonomy, competence, and relatedness exist. In understanding SDT, an overview of the Basic Needs Theory, Cognitive Evaluation Theory, and Organismic Integration Theory is presented.

Basic Needs Theory

Ryan and Deci (2000) identify the basic psychological needs of competence, relatedness, and autonomy as nutriments to self-determined behavior. Competence refers to feeling effective in one's ongoing interactions with the social environment and experiencing opportunities to exercise and express one's capacities (Ryan & Deci, 2000). Opportunities for competences allow participants to seek challenges that are optimal with respect to their abilities, and are conducive to persistent attempts related to enhancing skills and capacities through the activity. Competence is marked by feelings of confidence and effectance during and after the activity (Deci & Ryan, 2002). Relatedness refers to feeling connected to others, caring for and being cared for by those others and having a sense of belongingness both with other individuals and within a community (Ryan & Deci, 2000). Relatedness reflects on the human tendency to be with and accepted by others (Deci & Ryan, 2002). Autonomy refers to the attribution of the

origin or source of one's own behavior (Ryan & Deci, 2000). This means that individuals experience their behavior as an expression of self (Deci & Ryan, 2002). Autonomy reflects feelings of initiative and value (Deci & Ryan, 2002).

In understanding SDT, intrinsic motivation and extrinsic motivation are two major factors in related to behavioral engagement and continuity. Intrinsic motivation implies that an individual engages in an activity for the pleasure and satisfaction inherent in the activity (Deci & Ryan, 2002). Intrinsic motivation linked to prolonged activity engagement, where participation occurs for enjoyment. There are three different ways intrinsic motivation can occur through wanting to know, wanting to accomplish, or through the need to experience stimulation. Intrinsic motivation to know implies that an individual gets satisfaction from learning and understanding (Deci & Ryan, 2002). Intrinsic motivation to accomplish refers to gaining pleasure of completion of a task or surpassing a goal one has set (Deci & Ryan, 2002). Intrinsic motivation to experience stimulation is where an individual engages in activity because it stimulates their senses (Deci & Ryan, 2002). Intrinsic motivation helps keep participants in activities.

Basic needs theory is a basis for two sub-theories of Self-Determination Theory: Cognitive Evaluation Theory and Organismic Integration Theory (Ryan & Deci, 2000). These sub-theories explain the concept of intrinsic motivation and the process of internalization, respectively.

Cognitive Evaluation Theory

Cognitive Evaluation Theory (CET) is used to describe the effects of social contexts on people's intrinsic motivation (Ryan & Deci, 2000). Intrinsic motivation arises in settings where opportunities for competence and autonomy are supported. Competence provides feedback to

the individual while autonomy is based on the attribution of one's action to the individual. Ryan and Deci (2000) suggest that there are two primary processes that influence intrinsic motivation: *perceived locus of causality* and *perceived competence*. Perceived locus of causality relates to need for autonomy or control and choice, while perceived competence relates to the need for competence or feeling capable within behavior (Deci & Ryan, 2002). According to CET, positive feedback enhances intrinsic motivation only when people feel a sense of autonomy, while negative feedback undermines competence and lowers intrinsic motivation (Deci & Ryan, 2002). CET further specifies that contextual events can contain *controlling* and *information* aspects that result in effects on the perceptions of causality and competence (Deci & Ryan, 2002). The controlling aspects of social environments are related to external pressure and control (Deci & Ryan, 2002). The information aspect of social-context pertains to effectance-relevant inputs, or pertinent information related to making choices and acting effectively (Deci & Ryan, 2002). The information component allows for feedback to be supported by the experience of participants. Feedback is processed and evaluated within the individual to establish its functional significance, which is simply an assessment of controlling and information components that determine intrinsic motivation (Deci & Ryan, 2002). CET holds that self-controlling forms of regulation will diminish intrinsic motivation while autonomous forms will maintain or enhance it (Ryan & Deci, 2000).

Organismic Integration Theory

Organismic Integration Theory (OIT) concerns internalization and integration of values and regulations to the self. OIT is formulated to explain internalization (Deci & Ryan, 2002). Internalization is where individuals or groups use external prompts to encourage participation among uninteresting activities, and allows for the individual to find personal meaning or

significance to an activity that is initially externally regulated or motivated by external rewards (Deci & Ryan, 2002). The process hinges upon the ability of individuals to initiate behavior for reasons external to the self (e.g., rewards, avoid punishment), and then regulate behavior based on established qualities that are internal in nature (e.g., identity, values, beliefs, etc.).

An important element of OIT is that it views internalization as a term of continuum. On one side of the continuum is amotivation where an individual lacks the desire or intention to act. When people are amotivated, they participate without intention or act passively towards the activity (Deci & Ryan, 2002). At the other end of the continuum is intrinsic motivation, which is the state of doing an activity out of interest and inherent satisfaction. When people are intrinsically motivated, the activity has a meaning or purpose to the participant. Between amotivation and intrinsic motivation are four forms of extrinsic motivation; where motivation occurs by external regulation, introjected regulation, regulation through identification, and integrated regulation (Ryan & Deci, 2000).

External regulation occurs when participants act to avoid punishment or gain rewards. Introjected regulation involves participants participating in an activity because of some adopted value or perceived norm. Introjected regulation occurs to avoid anxiety related to the failure to perform a behavior. Regulation through identification is more self-determined because goals are set and are of importance to the participant. Integrated regulation is when identifications have been evaluated and brought together with the established values, goals, and needs that are important to the individual. When considering basic needs theory, OIT posits that support for autonomy leads to more internalized forms of regulation when support of relatedness and competence exist (Ryan & Deci, 2000).

Self-Determination Theory and Physical Activity

Researchers have often used a SDT framework to investigate physical activity participation (Daley & Duda, 2006; Deci & Ryan, 2002; Ntoumanis, 2001; Teixeira, Carraca, Markland, Silva, & Ryan, 2012; Vallerand, 1997). SDT is appealing because it provides various reasons for participation, and allows for the investigation of developmental, psychological, and physiological determinants of behavior (Ryan & Deci, 2000; Teixeira et al., 2012). Overall, studies demonstrate that youth are more likely to participate in physical activity if they learn to internalize the benefits resulting from participation (Teixeira et al., 2012).

Educational studies are ripe with evidence related to supporting basic psychological needs and influencing internal motivation and behavioral engagement in physical activity (Chatizisarantis & Hagger, 2009; Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2003; Vallerand, 1997). Climates that positively influenced physical activity behavior were those that fostered opportunities to demonstrate mastery and competence, offered choices for students, and developed environments that allowed positive relationships with peers and teachers (Chatizisarantis & Hagger, 2009; Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2003). Autonomy supportive teachers yielded greater numbers of students willing to participate in physical activities (Chatizisarantis & Hagger, 2009). Situations in which youth perceive themselves as competent also led to physical activity performance (Ntoumanis, 2001). While Standage et al. (2003) linked an autonomy supportive climate to student perceptions of autonomy, competence, and relatedness. Satisfaction of these basic needs, in turn, led to increased behavioral performance. Unmet or low levels of basic needs satisfaction were linked to amotivated states. In those situations where students were amotivated, negative consequences

(e.g., withdrawal from activity, lower levels of leisure time physical activity) were observed (Ntoumanis, 2001; Standage, Duda, & Ntoumanis, 2003).

The climates developed by teachers promote opportunities for intrinsic motivation and internalization of extrinsic behavior. Internalization is important to adopting and participating in new behaviors, and environments that promote internalization and intrinsic motivation offer opportunities for persistence over time (Deci & Ryan, 2002; Larson, 2000). Many of the activities that youth learn to adopt occur because these individuals have learned to internalize that activity (Watts & Caldwell, 2008). Internalization is often a process of finding personal meaning in an activity, and it can occur through adopting values and beliefs, personal identification, or complete integration into one's self (Ryan & Deci, 2000). Programs are most successful in promoting internalization when supports for the basic psychological needs of autonomy, competence, and relatedness exist. It follows then that programmers need to understand how and to what extent these needs are supported and subsequently, have a positive impact on physical activity behavior. Information gained from applying the SDT to physical activity will help foster personal choice, excitement, and fun for interventions and physical activity programs (Daley & Duda, 2006).

Summary

There is a growing concern about obesity in adolescence. The decline in physical activity participation among youth is growing because leisure time is predominantly occupied by sedentary activities such as playing video games, watching television, and surfing the internet. These activities are creating unhealthy lifestyles and fostering ailments that are harmful to youth's health. Leisure constraints also contribute to lack of physical activity among youth. Physical activity determinants are related to physiological and developmental factors,

environmental factors, and psychological, social and demographic factors. These determinates also play a role in participation in physical activities. A major problem facing youth is learning to internalize the benefits of being physically active. SDT is useful in understanding what motivates youth to participate and continue life-long participation in physical activities. The literature suggests a need to examine supports for autonomy, competence and relatedness as it relates to intrinsic motivation and internalization of values and beliefs that promote physical activity behaviors among youth. When investigating these phenomena, researchers are advised to focus on the processes that facilitate outcomes related to self-determination and behavioral engagement in order to determine what specific factors impact physical activity among youth.

CHAPTER III: METHODOLOGY

Introduction

The purpose of this study was to examine how supports for autonomy, competence and relatedness are related to the performance of physical activity behaviors among youth. This study examined how intrinsic motivation mediates the relationship between supports for basic psychological needs and physical activity behaviors. The procedures used to examine rural youth in eastern North Carolina are presented in the following sections; a) study design, b) population/sample selection, c) data collection, e) hypotheses, f) instrumentation, and g) analysis of data.

Study Design

The following section describes the methods used to explore this study's research questions. The study used a cross-sectional design and sampled students who attended schools located in a rural county in eastern North Carolina. The intent of this design was to understand the relationships between supports for basic psychological needs, motivation, and physical activity participation.

Population and Sample Selection

The mainland in Hyde County is rural and remote with a population density that averages nine people per square mile. The total population of Hyde County is 5,822. According to the U.S. Census Bureau (2011), Hyde County is fairly diverse with a Caucasian population of 65.9 %, African American population of 31.8%, and a growing Hispanic population of 7.1%. Nearly 76% of population has graduated high school and 11% of the population has a bachelor's degree or higher.

The population of this study came from two rural schools in eastern North Carolina. The two schools reside on one campus in mainland Hyde County. These schools were selected based on their participation in a community health initiative, which the researcher supported in his role as a research assistant. All students in grades 6-10 were sampled as part of an initial assessment of physical activity behavior of adolescents residing in this county. Students were purposively sampled in the pre-adolescent to early adolescent age range, because these youth are unable to drive and also unlikely to work. From a programmatic standpoint, Hyde County school administrators identified this group as a target group for intervention.

There are between 20 and 30 students per grade level within each school. This assessment informed a recently funded community change initiative that is designed to promote physical activity participation throughout the rural county in which these students reside. Data from this assessment were utilized by school faculty to develop target goals for a program designed to increase physical activity participation in schools served by the community change initiative.

The initiative is a community change intervention to reduce obesity among the inland residents of Hyde County. Since the year 2000, the prevalence of obesity in children ages 2-4 years in Hyde County has increased by approximately three percent every four years and remains higher than the statewide rate (Hyde County Health Department, 2010). Currently, one in five children entering kindergarten is obese. Among adults, nearly two-thirds of county residents are overweight. Obesity is a primary risk factor for cardiovascular disease, stroke, and Type 2 diabetes (Rooney, Schauberger, & Mathiason, 2005). Based on the age-adjusted incidence rates, the prevalence of heart disease and stroke remain above the state average in Hyde County. Age-adjusted diabetes death rates indicate that North Carolina averages 25.2 deaths from diabetes per

100,000 residents (State Health Facts, 2007). Hyde County averages 73.0 deaths per 100,000 residents (Hyde County Health Department, 2010).

Data Collection

Data were collected using an electronic questionnaire administered by school officials. The instrument was designed in Google forms and contained the scales under study. Questionnaires utilized a seven-day recall for physical activity participation, a scale measuring motivation for physically active behavior, and a scale assessing supports for basic psychological needs (i.e., autonomy, relatedness, and competence) in sport, exercise and physical education classes. Data were stripped of identifiers by school administrators, who then provided the an ASCII file to the researcher. The ASCII file was imported into the Statistical Package for the Social Sciences (SPSS) for analysis.

Instrumentation

As mentioned earlier, measurement occurred through the administration of an electronic questionnaire. The questionnaire was prepared with the intention of examining the research objectives. In general, those objectives were:

1. Examine the relationship between basic needs satisfaction (autonomy, competence and relatedness) and intrinsic motivation.
2. Examine the relationship between basic needs satisfaction (autonomy, competence and relatedness) and amotivation.
3. Examine the relationship between intrinsic motivation and physical activity participation.
4. Examine the relationship between amotivation and physical activity participation.
5. Examine how intrinsic motivation mediates the effects of basic needs satisfaction on physical activity participation.

In order to accomplish this, a variety of self-report measures were utilized to measure basic needs satisfaction, motivation type, and physical activity participation. Appendix A contains all measures and each scale is marked to indicate type and item measurement focus. Appendix B contains the institutional review board approval from East Carolina University's Office for Human Research Integrity.

Basic Needs Satisfaction and Motivation Type

Intrinsic motivation and amotivation were assessed though an adaptation of a questionnaire utilized by Goudas, Biddle, and Fox (1994), and Ntoumanis (2001). This scale consisted of twelve items, and measures intrinsic motivation, identified regulation, and amotivation. Each motivation state has four items. Past studies indicate acceptable reliability with Cronbach's Alpha ranging between .63-.81 (Goudas, et al. 1994; Ntoumanis, 2001). While motivation is a fairly dynamic state, the use of questionnaires is common to assess self-determination.

Basic needs satisfaction used several previous instruments to assess the degree to which basic needs were met. Items measuring competence were adapted from the Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989) with guidance from Ntoumanis (2001). Support for competence is a three item measure, and has a reported Cronbach's Alpha ranging between .84 - .85 (Ntoumanis).

Items measuring autonomy support and relatedness were informed by Ntoumanis (2001). Ntoumanis used two-item scales to measure autonomy support and relatedness. However, these items focused solely on participation in physical education class. The measures were adapted to reflect physical activity broadly and added an additional item to capture a general range of sport and exercise activities that could occur through school or in leisure.

Physical Activity Questionnaire for Children (PAQ-C)

Physical activity was measured through the Physical Activity Questionnaire for Children (PAQ-C) using a seven-day recall method (Kowalski, Crocker, & Donen, 2004). The PAQ-C is a well-developed questionnaire used to obtain comparable estimates of physical activity in the moderate to vigorous range. This questionnaire offers a feasible way to measure physical activity among large groups and populations. Previous studies employed the PAQ-C with children between the ages of 8-14 years, which is similar to the study population in question. Nine items assess physical activity levels. An inventory of physical activities assesses the types of physical activities in which participants engage. Items two through eight assess the extent of time one spends in highly active pursuits within a range of contexts (i.e., recess, physical education classes, etc.). Item nine assesses the days on which one is active. General physical activity scores are calculated as an average physical activity score (PA score) in a continuous range from 1 (low active) to 5 (high active). Over several studies, this questionnaire demonstrates good construct and convergent validity, and has demonstrated internal consistency scores (i.e., Cronbach's Alpha) within a range between .79 and .89.

The PAQ-C instrument yields a composite score for each of the nine items. A composite score of '1' indicates low physical activity and progresses to '5' which indicates high physical activity. Once composite scores were calculated for each item, the mean of these nine items were calculated. The mean of composite scores resulted in the final PAQ-C activity summary score.

Basic Needs Satisfaction

Basic needs satisfaction scoring occurred by calculating the average for each subscale used for this study (i.e., perceived competence, autonomy support, or relatedness). Example items are "I have a say in sport or exercise I do" (autonomy support), "I think I am pretty good at sport or exercise" (perceived competence), and "Playing sports or exercising makes me feel close to other kids my age" (relatedness). For each item, respondents were asked to indicate if they disagree or agree with the statement. This was measured on a five-point scale with responses being: (1) Strongly Disagree; (2) Disagree; (3) Not Sure; (4) Agree; and (5) Strongly Agree. A mean subscale score for each basic need was derived based on responses to each set of items.

Motivation Types

Scoring for motivation types calculated the average each set of items used to measure motivation types. This study focused specifically on those items measuring intrinsic motivation and amotivation. Example items are "I take part in sport or exercise because sport or exercise is fun" (intrinsic), and "I take part in sport or exercise but I can't see any good coming from playing a sport or exercising" (amotivation). For each item, respondents were asked to indicate if they disagree or agree with the statement. Each statement was measured on a five-point scale with values ranging from 1= Strongly Disagree to 5= Strongly Agree. Each subscale yielded a mean score for the set of items used to measure motivation type.

Analysis of Data

Data were entered into a database using the Statistical Package for the Social Sciences (SPSS). Following data entry, data were reviewed descriptively for out of range and missing data, and also to review the range and skewness or kurtosis of responses to specific items. Following this review, data were compiled into appropriate scales and reviewed for reliability

through tests of internal consistency examining Cronbach's Alpha. To address the research hypotheses, the analysis utilized specific methods for assessing mediating models with predictor variables entered in a sequence of blocks as directed by Baron & Kenny (1986).

CHAPTER IV: RESULTS

Introduction

This chapter presents the results of the hypotheses formulated in chapter one which examined how supports for basic psychological needs (i.e., autonomy, competence, and relatedness) and type of motivation are related to the performance of physical activity behaviors among youth. This chapter is divided into three sections: (1) profile of respondents, (2) summary statistics for scaled scores, (3) comparisons among study variables, and (4) results of hypothesis testing.

Profile of Respondents

The electronic questionnaire was prepared with the intention of examining the research objectives. Demographic information included gender, race/ethnicity, grade, and age. Data from 115 respondents were collected and analyzed. This represents approximately 65% of the total target population for this study. By grade the sample captured 67.6% of sixth grade students, 83.3% of seventh grade students, 72.2% of eighth grade students, 64.0% of ninth grade students, and 35.9% of tenth grade students. Data were collected May 2011 following the state end-of-grade tests. Questionnaires were administered by school officials, and were completed over the course of a school week. Questionnaires were not completed by students who were absent from school, away from campus because of athletics, or attending remedial education during administration times.

All respondents in the sample attended one of two schools located on the mainland portion of Hyde County. As shown in Table 1, male (52.6%) and female (47.4%) respondents were fairly balanced in their distribution. The sample had a near even split in representation of

students who were African American (42.1%) and Caucasian (41.2%) respondents. Approximately 17.0% of the sample was categorized as Other for ethnicity, and this group consisted of students who were Hispanic or who reported bi- or multi-racial status. Students in seventh grade represented the largest group captured in the sample (30.7%); this group was followed by eighth grade (22.8%), sixth grade (20.2%), ninth (14.0%), and tenth grade (12.3%). The age of participants was consistent with the grades represented. A summary of respondents' characteristics is presented in Table 1.

Table 1

Characteristics of Respondents

Category	Sample (n)	%	Valid %
Gender			
Male	60	52.2	52.6
Female	54	47.0	47.4
Missing	1	.9	-
Total	115	100.0	100.0
Race/Ethnicity			
African American	47	40.9	42.0
Caucasian	46	40.0	41.1
Other*	19	16.5	16.9
Missing	3	2.6	-
Total	115	100.0	100.0
Grade			
6^{th}	23	20.0	20.2
7^{th}	35	30.4	30.7
8^{th}	26	22.6	22.8
9^{th}	16	13.9	14.0
10^{th}	14	12.2	12.3
Missing	1	.9	-
Total	115	100.0	100.0
Age (Mean=13.57 , SD=1.34)			
11	4	3.5	3.7
12	21	18.3	19.3
13	33	28.7	30.3
14	19	16.5	17.4
15	24	20.9	22.0
16	7	6.1	6.4
17	1	.9	.9
Missing	6	5.2	-
Total	115	100.0	100.0

*Includes Latino/Hispanic

Leisure Time Physical Activity

An inventory of leisure time physical activities collected information on what respondents did in their spare time. Twenty items were used to measure leisure time physical activities (e.g., Have you done any of the following activities in the past 7 days? If yes, how many times?). Leisure time physical activities were measured on a five-point scale with responses being: (1) No; (2) 1-2 times; (3) 3-4 times; (4) 5-6 times; and (5) 7 times or more. Activities respondents participated in the most were basketball (Mean=2.92), walking for exercise (Mean=2.81), jogging or running (Mean=2.73), and baseball/softball (Mean=2.37). Table 2 provides a summary of leisure physical activity level.

Table 2

Summary of Leisure Time Physical Activities

	Leisure Time Physical Activity					
	1= No	2= 1-2 times	3= 3-4 times	4= 5-6 times	5= 7 times or more	
Items	n (%)	N (%)	n (%)	n (%)	n (%)	M
Weight-Lifting	75 (65.2)	22 (19.1)	9 (7.8)	5 (4.3)	4 (3.5)	1.62
Rowing/Canoeing	110 (95.7)	3 (2.6)	2 (1.7)	0 (-)	0 (-)	1.06
In-line Staking	110 (95.7)	3 (2.6)	1 (.9)	1 (.9)	0 (-)	1.07
Tag	83 (72.2)	17 (14.8)	11 (9.6)	2 (1.7)	2 (1.7)	1.46
Walking	24 (20.9)	26 (22.6)	33 (28.7)	12 (10.4)	20 (17.4)	2.81
Bicycling	52 (45.2)	23 (20)	18 (15.7)	8 (7)	14 (12.2)	2.21
Jogging/Running	29 (25.2)	25 (21.7)	28 (24.3)	14 (12.2)	19 (16.5)	2.73
Aerobics	89 (77.4)	8 (7)	6 (5.2)	6 (5.2)	6 (5.2)	1.54
Swimming	68 (59.1)	15 (13)	13 (11.3)	7 (6.1)	12 (10.4)	1.96
Baseball/Softball	50 (43.5)	22 (19.1)	13 (11.3)	13 (11.3)	16 (11.3)	2.37
Dance/Cheerleading	75 (65.2)	9 (7.8)	13 (11.3)	4 (3.5)	14 (12.2)	1.90
Hunting	86 (74.8)	10 (8.7)	8 (7)	5 (4.3)	6 (5.2)	1.57
Football	60 (52.2)	17 (14.8)	14 (12.2)	6 (5.2)	18 (15.7)	2.17
Martial Arts	98 (85.2)	6 (5.2)	1 (.9)	3 (2.6)	7 (6.1)	1.39
Frisbee	107 (93)	5 (4.3)	1 (.9)%	0 (-)	2 (1.7)	1.13
Skateboarding	92 (80)	11 (9.6)	5 (4.3)	5 (4.3)	2 (1.7)	1.38
Soccer	96 (83.5)	10 (8.7)	1 (.9)	3 (2.6)	5 (4.3)	1.36
Hockey	113 (98.3)	2 (1.7)	0 (-)	0 (-)	0 (-)	1.02
Volleyball	81 (70.4)	13 (11.3)	9 (7.8)	4 (3.5)	8 (7)	1.65
Basketball	37 (32.2)	15 (13)	17 (14.8)	14 (12.2)	31 (27)	2.92

Motivation Scales

Two separate scales were used to assess motivation among respondents. The scales contained items that measure intrinsic motivation and amotivation (Ntoumanis, 2001). For each item, respondents were asked to indicate if they disagree or agree with the statement. Each statement was measured on a five-point scale with values ranging from 1= Strongly Disagree to 5= Strongly Agree. A summary score for motivation types was derived based on these responses.

Tables 3 and 4 report statistics for each scale. Table statistics include the mean, standard deviation, number of respondents, and Cronbach's Alpha of the item was deleted from the total scale. A total Cronbach's Alpha is also reported for each scale in the table

Table 3

Motivation Type Scale: Intrinsic Motivation

Item	Mean	*SD*	*N*	Alpha if item deleted
I take part in sport or exercise because…				
-sport or exercise is fun	4.09	1.11	114	.93
-of the enjoyment I feel	4.10	1.09	114	.91
-sport or exercise is exciting	3.88	1.21	114	.91
-it makes me feel good	3.95	1.14	114	.93
-important for me to be good	3.93	1.17	114	.94
Total Scale Mean	3.98	5.13	114	
Cronbach's Alpha (Total Scale)=.94				

Note: Scales ranged 1 (Strongly Disagree) to 5 (Strongly Agree)

Table 3 indicates adequate reliability (α=.94) for the scale measuring intrinsic motivation.

Table 4

Motivation Type Scale: Amotivation

Item	Mean	*SD*	*N*	Alpha if item deleted
I take part in sport or exercise but…				
-I can't see any good	2.54	1.44	114	.90
-I really don't know why	2.45	1.42	114	.86
-I don't see why	2.39	1.39	114	.85
-I feel I am wasting my time	2.39	1.50	114	.88
Total Scale Mean	2.44	5.05	114	
Cronbach's Alpha (Total Scale)=.90				

Note: Scales ranged 1 (Strongly Disagree) to 5 (Strongly Agree)

Table 4 indicates an adequate reliability (α=.90) for the scale measuring amotivation.

Basic Needs Satisfaction Scales

Three separate scales were used to assess basic needs satisfaction among respondents. The scales used a set of items that measure support for perceived competence, autonomy support, and support for relatedness in physical activity. For each item, respondents were asked to indicate if they disagree or agree with the statement. This was measured on a five-point scale with responses being: (1) Strongly Disagree; (2) Disagree; (3) Not Sure; (4) Agree; and (5) Strongly Agree. A summary score for basic needs satisfaction was derived based on these responses.

Tables 5 through 7 report statistics for each scale. Table statistics include the mean, standard deviation, number of respondents, and Cronbach's Alpha if the item was deleted from the total scale. A Cronbach's Alpha for the total scale is also reported in the table.

Table 5

Basic Needs Satisfaction Scale: Support for Perceived Competence

Item	Mean	SD	N	Alpha if item deleted
I think…				
-I am pretty good at sport or exercise	4.04	1.06	114	.73
-satisfied with my performance in sport	3.94	1.11	114	.79
-I am pretty skilled in sport or exercise	3.96	1.10	114	.72
-after sport or exercise, I feel good about myself	3.89	1.11	114	.77
-I don't play sport or exercise very well*	3.68	1.35	114	.92
Total Scale	3.90	4.42	114	
Cronbach's Alpha (Total Scale)=.92				

*item reflected

Note: Scales ranged 1 (Strongly Disagree) to 5 (Strongly Agree)

Table 5 indicates adequate reliability (α=.92) for the scale measuring perceived competence.

Table 6 reports the scale statistics for the measure of autonomy support. This scale demonstrated adequate reliability (α=.68) for a three-item scale (Cortina, 1993). Deleting the item, "I think I can decide what activities I want to practice in PE," increases level of internal consistency for this scale. However, the item remains because of its performance in past studies and to maintain the scale's integrity.

Table 6

Basic Needs Satisfaction Scale: Autonomy Support

Item	Mean	*SD*	*N*	Alpha if item deleted
I think…				
-I have a say in what sport or exercise I do	3.82	1.13	114	.38
-I decide what sport/exercise I do in my time…	4.06	.99	114	.57
-I can decide what activities I want to practice	3.10	1.36	114	.80
Total Scale	3.65	2.74	114	--
Cronbach's Alpha (Total Scale)=.68				

Note: Scales ranged 1 (Strongly Disagree) to 5 (Strongly Agree)

Table 7 indicates adequate reliability (α=.85) for the scale measuring relatedness. While deleting the item, "I think when I am in PE class, I feel closer to other students," improves the scale, this item was kept because the improvement was marginal.

Table 7

Basic Needs Satisfaction Scale: Support for Relatedness

Item	Mean	SD	N	Alpha if item deleted
I think…				
-sport/exercise makes me feel close to other kids	3.77	1.21	114	.70
-sport/exercise makes me feel connected with…	3.77	1.15	114	.78
-when I am in PE class, I feel closer to other students	3.41	1.27	114	.88
Total Scale	3.65	3.19	114	
Cronbach's Alpha (Total Scale)=.85				

Note: Scales ranged 1 (Strongly Disagree) to 5 (Strongly Agree)

Bivariate Comparisons by Demographic Variables on Study Variables

The proposed hypotheses controlled for the effect of demographic variables on the primary outcome (i.e., physical activity behavior) and the prediction of the mediator (motivation type) to determine the relationship of distal predictor (basic needs satisfaction) with the mediating and outcome variable, and the relationship of the mediator to the outcome variable. Before multiple regression analyses were performed, a series of bivariate comparisons were made to determine what, if any, relationships existed between select demographic variables (i.e., race/ethnicity, gender, and grade) and the study variables (i.e., basic needs satisfaction, motivation type, and physical activity behavior). These analyses were performed because each of these variables is a source of developmental variation on the measures under investigation. This series of analyses follows.

Comparisons by Race/Ethnicity on Study Variables

An analysis of variance (ANOVA) was conducted to examine if mean differences in physical activity behavior existed by race/ethnicity. Table 8 indicates that there were no significant mean differences in physical activity level by race/ethnicity (F = .384, p =.68).

Table 8

Summary of ANOVA Comparing Ethnicity and Physical Activity Behavior (N=104)

	Physical Activity Behavior			
Ethnicity	M	SD	F	p-value
African-American (n=45)	2.53	.70	.38	.68
Caucasian (n=43)	2.63	.63		
Other (n=16)	2.49	.61		
Total	2.56	.65		

An ANOVA was conducted to examine if mean differences in intrinsic motivation for physical activity existed by race/ethnicity. Table 9 indicates that there were no significant mean differences in the measure for intrinsic motivation by race/ethnicity ($F = 1.78$, $p = .17$).

Table 9

Summary of ANOVA Comparing Ethnicity and Intrinsic Motivation (N=102)

	Intrinsic Motivation			
Ethnicity	M	SD	F	p-value
African-American (n=47)	4.03	1.07	1.78	.17
Caucasian (n=46)	3.81	1.08		
Other (n=19)	4.33	.70		
Total	3.99	1.03		

An ANOVA was conducted to examine if mean differences in amotivation existed by race/ethnicity. Table 10 indicates that there were no significant mean differences in amotivation level by race/ethnicity ($F = 1.12$, $p = .32$).

Table 10

Summary of ANOVA Comparing Ethnicity and Amotivation (N=102)

	Amotivation			
Ethnicity	M	SD	F	p-value
African-American (n=47)	2.64	1.30	1.12	.32
Caucasian (n=46)	2.29	1.25		
Other (n=19)	2.26	1.23		
Total	2.43	1.27		

An ANOVA was conducted to examine if mean differences in autonomy support existed by race/ethnicity. Table 11 indicates that there were no significant mean differences in the level of autonomy support by race/ethnicity ($F = .51$, $p = .60$).

Table 11

Summary of ANOVA Comparing Ethnicity and Autonomy Support (N=102)

Autonomy Support				
Ethnicity	M	SD	F	p-value
African-American (n=47)	3.75	.95	.51	.60
Caucasian (n=46)	3.55	.88		
Other (n=19)	3.64	.97		
Total	3.65	.92		

An ANOVA was conducted to examine if mean differences in perceived competence existed by race/ethnicity. Table 12 indicates that there were no significant mean differences in perceived competence level by race/ethnicity (F = .007, p =.99).

Table 12

Summary of ANOVA Ethnicity and Perceived Competence (N=102)

Perceived Competence				
Ethnicity	M	SD	F	p-value
African-American (n=47)	3.89	.96	.01	.99
Caucasian (n=46)	3.90	.86		
Other (n=19)	3.92	.81		
Total	3.90	.89		

An ANOVA was conducted to examine if mean differences in relatedness existed by race/ethnicity. Table 13 indicates that there were no significant mean differences in relatedness by race/ethnicity (F = .943, p =.39).

Table 13

Summary of ANOVA Comparing Ethnicity and Relatedness (N=102)

	Relatedness			
Ethnicity	M	SD	F	p-value
African-American (n=47)	3.75	1.20	.94	.39
Caucasian (n=46)	3.48	1.10		
Other (n=19)	3.78	.73		
Total	3.65	1.07		

Comparisons by Grade Level on Study Variables

An ANOVA was conducted to examine if mean differences in physical activity level existed by grade. Table 14 indicates that there were no significant mean differences in physical activity level by grade (F = 1.62, p =.17).

Table 14

Summary of ANOVA Comparing Grade level and Physical Activity Behavior (N=102)

	Physical Activity Behavior			
Grade	M	SD	F	p-value
6th (n=22)	2.77	.59	1.62	.17
7th (n=31)	2.67	.64		
8th (n=25)	2.47	.67		
9th (n=15)	2.28	.65		
10th (n=13)	2.49	.69		
Total	2.57	.65		

An ANOVA was conducted to examine if mean differences in intrinsic motivation for physical activity existed by grade. Table 15 indicates that there were no significant mean differences in intrinsic motivation existed by grade (F = .184, p =.94).

Table 15

Summary of ANOVA Comparing Grade Level and Intrinsic Motivation (N=114)

	Intrinsic Motivation			
Grade	M	SD	F	p-value
6th (n=23)	3.91	1.22		
7th (n=35)	3.98	.95		
8th (n=26)	3.96	1.03	.18	.94
9th (n=16)	3.95	1.22		
10th (n=14)	4.20	.66		
Total	3.98	1.02		

An ANOVA was conducted to examine if mean differences in amotivation for physical activity existed by grade. Table 16 indicates that there were no significant mean differences in amotivation level by grade (F = .188, p =.11).

Table 16

Summary of ANOVA Comparing Grade Level and Amotivation (N=114)

	Amotivation			
Grade	M	SD	F	p-value
6th (n=23)	3.00	1.35		
7th (n=35)	2.32	1.24		
8th (n=26)	2.46	1.39	1.88	.11
9th (n=16)	2.31	1.05		
10th (n=14)	1.92	.88		
Total	2.44	1.26		

An ANOVA was conducted to examine if mean differences in autonomy support for physical activity existed by grade. Table 17 indicates that there were no significant mean differences in autonomy support by grade (F = .1.07, p =.37).

Table 17

Summary of ANOVA Comparing Grade Level and Autonomy Support (N=114)

Autonomy Support				
Grade	M	SD	F	p-value
6th (n=23)	3.57	1.09	1.07	.37
7th (n=35)	3.79	.86		
8th (n=26)	3.38	.95		
9th (n=16)	3.70	.88		
10th (n=14)	3.90	.60		
Total	3.65	.91		

An ANOVA was conducted to examine if mean differences in support for relatedness in physical activity existed by grade. Table 18 indicates that there were no significant mean differences in relatedness by grade (F = .651, p =.62).

Table 18

Summary of ANOVA Comparing Grade Level and Relatedness (N=114)

Relatedness				
Grade	M	SD	F	p-value
6th (n=23)	3.81	1.24	.65	.62
7th (n=35)	3.77	1.13		
8th (n=26)	3.38	1.09		
9th (n=16)	3.60	.80		
10th (n=14)	3.64	.76		
Total	3.65	1.06		

An ANOVA was conducted to examine if mean differences in perceived competence existed by grade. Table 19 indicates that there were no significant mean differences in perceived competence for physical activity by grade (F = .412, p =.79).

Table 19

Summary of ANOVA Comparing Grade Level and Perceived Competence (N=114)

	Perceived Competence			
Grade	M	SD	F	p-value
6th (n=23)	3.86	1.03		
7th (n=35)	4.02	.78		
8th (n=26)	3.73	.99	.41	.79
9th (n=16)	3.93	.94		
10th (n=14)	3.91	.56		
Total	3.90	.88		

Comparisons by Gender on Study Variables

An independent-sample T-test was conducted to examine if mean differences in physical activity behavior existed by gender. Table 20 indicated that there was a significant difference in physical activity behavior between males and females (t = 3.49, p =.00) with males having higher means than females on this measure.

Table 20

Summary of T-Test Comparing Gender and Physical Activity Behavior

		Physical Activity Behavior			
Gender	n	M	SD	T	p-value
Male	56	2.77	.58		
Female	50	2.34	.66	3.49	.00**
Total	106	2.57	.65		

** p<.01

An independent-sample T-test was conducted to examine if mean differences in intrinsic motivation for physical activity existed by gender. Table 21 indicated that there was a significant difference in intrinsic motivation by gender (t = 2.48, p =.01) with males having higher mean scores than females on the scale measuring intrinsic motivation for physical activity.

Table 21

Summary of T-Test Comparing Gender and Intrinsic Motivation

		Intrinsic Motivation			
Gender	n	M	SD	T	p-value
Male	60	4.21	1.02		
Female	54	3.74	.98	2.48	.01*
Total	114	3.98	1.02		

*p<.05

An independent-sample T-test was conducted to examine if mean differences in amotivation for physical activity existed by gender. Table 22 indicated that there was no significant difference in amotivation by gender (t = -1.18, p =.23).

Table 22

Summary of T-Test Comparing Gender and Amotivation

		Amotivation			
Gender	n	M	SD	T	p-value
Male	60	2.30	1.28		
Female	54	2.58	1.23	-1.18	.23
Total	114	2.44	1.26		

An independent-sample T-test was conducted to examine if mean differences in autonomy support for physical activity existed by gender. Table 23 indicated that there was a significant difference in autonomy support by gender (t = 2.20, p =.03) with males having higher mean autonomy support scores than females.

Table 23

Summary of T-Test Comparing Gender and Autonomy Support

		Autonomy Support			
Gender	n	M	SD	T	p-value
Male	60	3.83	.92		
Female	54	3.46	.87	2.20	.03*
Total	114	3.65	.91		

* p<.01

An independent-sample T-test was conducted to examine if mean differences in perceived competence existed by gender. Table 24 indicated that there was not a significant difference in perceived competence by gender (t = 1.84, p =.06).

Table 24

Summary of T-Test Comparing Gender and Perceived Competence

		Perceived Competence			
Gender	n	M	SD	T	p-value
Male	60	4.04	.90		
Female	54	3.74	.84	1.84	.06
Total	114	3.90	.88		

An independent-sample T-test was conducted to examine mean differences in support for relatedness in physical activity by gender. Table 25 indicated that there was a significant difference in relatedness by gender (t = 3.22, p =.00) with males reporting higher mean levels of relatedness when compared to females.

Table 25

Summary of T-Test Comparing Gender and Relatedness

		Relatedness			
Gender	n	M	SD	T	p-value
Male	60	3.94	1.04		
Female	54	3.32	.99	3.22	.00**
Total	114	3.65	1.06		

** p<.01

A bivariate comparison was conducted to examine grade level and gender. Table 26 indicated that there was no significant difference in grade level among gender (p = .46, *Cramer's V*=.17).

Table 26

Summary of Bivariate Comparison by Grade Level and Gender

	Male		Female	
Grade	n	%	n	%
6th	11	18.3	12	22.2
7th	23	38.3	12	22.2
8th	12	20.0	14	25.9
9th	7	11.7	9	16.7
10th	7	11.7	7	13.0
Total	60	52.6	54	47.4

Chi-square=3.59, *p*=.46, *Cramer's V*=.17

A bivariate comparison was conducted to examine grade level and ethnicity. The majority of African American (15.2%) and Caucasian (11.6%) respondents were in 7th grade. Approximately 5.4% Other respondents were in the 8th grade. However, Table 27 indicated that there was no significant difference in grade level among ethnicity (p = .80, Cramer's V=.14).

Table 27

Summary of Bivariate Comparison by Grade Level and Ethnicity

	African American		Caucasian		Other	
Grade	n	%	n	%	N	%
6th	9	8.0	10	8.9	3	2.7
7th	17	15.2	13	11.6	4	3.6
8th	12	10.7	8	7.1	6	5.4
9th	5	4.5	8	7.1	3	2.7
10th	4	3.6	7	6.3	3	2.7
Total	47	42.0	46	41.1	19	17.0

Chi-square=4.50, *p*=.80, *Cramer's V*=.14

Prior to multivariate analyses, bivariate correlations were performed to examine relationships between the predictor and outcome variables. Variables entered into analysis included physical activity level, motivation types, and the variables measuring basic needs satisfaction.

Table 28

Bivariate Correlations among the Study Variables (N=115)

	1	2	3	4	5	6
1.PA Level	_	.354**	-.124	.281**	.125	.247*
2.Intrinsic Mot.	.354**	_	-.198*	.747**	.569**	.625**
3.Amotivation	-.124	-.198*	_	-.404**	-.061	-.079
4.Perc. Competence	.281**	.747**	-.404**	_	.593**	.683**
5.Aut.Support	.125	.569**	-.061	.593**	_	.689**
6.Relatedness	.247*	.625**	-.079	.683**	.689**	_

*$p \leq .05$ (2-tailed);**$p \leq .01$ (2-tailed).

The outcome variable, physical activity level, was significantly and positively related to intrinsic motivation (r=.354, p<.01), perceived competence (r=.281, p<.01), and relatedness (r=.247, p<.05). Intrinsic motivation, a proposed mediator, was positively related to the three basic needs variables: perceived competence (r=.747, p<.01), autonomy support (r=.569, p<.01), and relatedness (r=.625, p<.05). Amotivation was negatively related to intrinsic motivation (r= -.198, p<.05) and perceived competence (r= -.404, p<.01). Perceived competence was positively related to autonomy support (r=.569, p<.01) and relatedness (r=.625, p<.01). Autonomy support and relatedness were also positively related to each other (r=.689, p<.01).

Results of Hypothesis Testing

Study hypothesis were developed to test how supports for basic needs satisfaction were related to physical activity behavior among youth. The hypotheses examined how motivation mediated the relationship between supports for basic psychological needs and performance of physical activity behaviors.

Hypotheses testing were guided by the process for testing mediation, as directed by Baron and Kenny (1986). This analysis procedure requires four steps. First, a regression analysis is performed to test the relationship between the distal predictor variables and the outcome variable. In this study, the test utilized measures of basic need satisfaction (supports for autonomy, relatedness and competence) as predictors of the outcome, physical activity participation. The second procedure tests the relationship between the distal predictor and mediating variable. Analysis procedures in this test examined the relationships between basic needs satisfaction and motivation. Separate analyses were performed to test the relationship between the basic needs variables and amotivation, and also the relationship between the basic needs variables and intrinsic motivation.

The third step in mediation analysis tests the relationship between the mediating variable and the outcome variable. In analyses, this required testing the relationship between motivation and physical activity participation. Again, separate analyses were performed for intrinsic motivation and amotivation. The final model regresses the distal predictor and mediating variables on the outcome variable. If the relationship between the distal predictor and outcome variable disappears in the presence of the mediating variable, full mediation is presumed. If the relationship between the distal predictor and outcome variable significantly diminishes when including the mediating variable in analysis, partial mediation is presumed. Mediation must be confirmed using a post hoc test, and this analysis used Sobel's test as directed by Baron and Kenny. Mediation does not exist if, while in the presence of the mediator, the predictive relationship between the distal predictor and outcome variable remains the same or not significantly diminished. Analyses are presented in order of hypotheses, which are restated before each table of results.

Hypothesis One

Perceptions of need satisfaction will be positively related to internalized motivation to participate in physical activity.

Table 29.

Basic Needs Satisfaction Predicting Internalized Motivation

	B	SE B	β	t	sig.
Model 1. Control Variables					
Constant	4.453	.659		6.754	
Race DV1 (African American)	-.188	.265	-.091	.712	.478
Race DV2 (Caucasian)	-.404	.265	.194	-1.524	.130
Gender	-.463	.189	-.226	-2.451	.016
Grade	.060	.074	.075	.807	.421
Model 2. with Basic Needs					
Constant	.391	.542		.721	
Race DV1 (African American)	-.212	.171	-.102	-1.240	.218
Race DV2 (Caucasian)	-.379	.173	.182	-2.199	.030*
Gender	-.140	.127	-.068	-1.097	.275
Grade	.056	.048	-.070	1.153	.251
Perceived Competence	.671	.098	.578	6.848	.000**
Autonomy Support	.193	.096	.171	2.008	.047*
Relatedness	.081	.093	.084	.863	.390

* $p<.05$, ** $p<.01$
Model 1. $R^2= .079$, $p=$ n.s.
Model 2. $R^2= .626$, $R^2Change= .547$, $p= <.001$

This study tested hypothesis one through regression. Basic needs satisfaction tested as a predictor of internalized motivation to participate in physical activity while controlling for the variables that might explain developmental variation (i.e., race/ethnicity, gender, and grade).

When examining basic needs, perceived competence (*b*= .671, *t*=6.848, *p*<.001) and autonomy support (*b*= .193, *t*=2.008, *p*=.047) were positively predictive of intrinsic motivation. There was no significant relationship between relatedness and intrinsic motivation. Support for this hypothesis only applies to the relationship between the two basic needs variables (i.e., perceived competence and autonomy support) and internalized motivation to participate in physical activity. Youth who reported higher levels of perceived competence and autonomy support were more likely to report higher levels of intrinsic motivation for physical activity. The final model accounted for nearly 63% of the variation in intrinsic motivation for physical activity (R^2=.626), and the addition of the basic needs variables significantly contributed to this final model (R^2 *Change*=.547).

Hypothesis Two

Perceptions of need satisfaction will be negatively related to amotivation to participate in physical activity.

To preserve continuous pagination, Table 30 follows this report of results. This study tested hypothesis two through regression analysis. The relationship between basic needs satisfaction variables (i.e., perceived competence, autonomy support, and relatedness) and amotivation to participate in physical activity was tested. As hypothesized perceived competence was negatively predictive of amotivation to participate in physical activity (*b*= -.977, *t*=5.977, *p*<.001), meaning that when supports for competence did not exist amotivation was likely high. Interestingly, relatedness was positively predictive of amotivation (*b*= .331, *t*=2.124, *p*<.036), which ran counter to the hypothesized relationship. There was no relationship between autonomy support and amotivation to participate in physical activity. Support for this hypothesis was only found for the negative relationship between perceived competence and amotivation to participate in physical activity. Youth who reported higher levels of perceived competence were

likely to report lower levels of amotivation for physical activity. Counter to the stated hypothesis, youth with higher levels of relatedness were likely to report higher levels of amotivation. The final model accounted for 31% of the variation in amotivation for physical activity (R^2=.311), and the addition of the basic needs variables significantly contributed to this final model (R^2 *Change*=.238).

Table 30.

Basic Needs Satisfaction Predicting Amotivation

	B	SE B	β	t	sig.
Model 1. Control Variables					
Constant	3.405	.813		4.189	
Race DV1 (African American)	-.188	.265	.111	-.712	.478
Race DV2 (Caucasian)	-.404	.265	-.014	-1.524	.130
Gender	.316	.233	.125	1.355	.178
Grade	-.200	.091	-.203	-2.190	.031*
Model 2. with Basic Needs					
Constant	-5.050	.904		5.584	
Race DV1 (African American)	.262	.286	.102	.916	.362
Race DV2 (Caucasian)	.083	.288	.033	.033	.733
Gender	.312	.213	.124	1.469	.145
Grade	-.199	.081	-.203	-2.470	.015*
Perceived Competence	-.977	.163	.685	-5.977	.000**
Autonomy Support	.251	.160	.182	1.572	.119
Relatedness	.331	.156	.279	2.124	.036*

* p<.05, ** p<.01
Model 1. R^2= .073, p= n.s.
Model 2. R^2= .311, R^2*Change*= .238, p= <.001

Hypothesis Three

Internalized motivation to participate in physical activity will be positively related to physical activity.

Table 31.

Internalized Motivation Predicting Physical Activity

	B	SE B	β	t	sig.
Model 1. Control Variables					
Constant	3.887	.421		9.238	
Race DV1 (African American)	-.011	.173	-.008	-.065	.949
Race DV2 (Caucasian)	.123	.173	.093	.710	.479
Gender	-.412	.120	-.315	-3.426	.001**
Grade	-.098	.047	-.192	-2.086	.040*
Model 2. with Basic Needs					
Constant	2.939	.482		6.101	
Race DV1 (African American)	.016	.164	.012	.097	.923
Race DV2 (Caucasian)	.193	.166	.145	1.165	.247
Gender	-.307	.118	-.234	-2.596	.011*
Grade	-.106	.045	-.209	-2.390	.019*
Intrinsic Motivation	.205	.058	.319	3.511	.001**

* $p<.05$, ** $p<.01$
Model 1. $R^2= .149$, $p= .002$
Model 2. $R^2= .243$, $R^2Change=.093$, $p= .001$

Hypothesis three was tested by regressing intrinsic motivation on physical activity participation. Controlling for the effect of gender, race, and grade, there was a significant relationship between intrinsic motivation and physical activity ($b= .205$, $t=3.511$, $p<.001$). Evidence from this analysis supports hypothesis 3. Youth with higher levels of intrinsic motivation were more likely to participate in physical activity. The final model accounted for 24% of the variation in physical activity participation ($R^2=.243$). Intrinsic motivation explained

an additional 9.3% of the variance in physical activity beyond what was accounted by the control variables.

Hypothesis Four

Amotivation to participate in physical activity will be negatively related to physical activity behavior.

Table 32.

Amotivation Predicting Physical Activity

	B	SE B	β	t	sig.
Model 1. Control Variables					
Constant	3.887	.421		9.238	
Race DV1 (African American)	-.011	.173	-.008	-.065	.949
Race DV2 (Caucasian)	.123	.173	.093	.710	.479
Gender	-.412	.120	-.315	-3.426	.001**
Grade	-.098	.047	-.192	-2.086	.040*
Model 2. with Basic Needs					
Constant	4.067	.449		9.067	
Race DV1 (African American)	-.001	.172	-.001	-.008	.993
Race DV2 (Caucasian)	.118	.173	.088	.679	.499
Gender	-.389	.122	-.297	-3.192	.002**
Grade	-.108	.048	-.212	-2.264	.026*
Amotivation	.058	.050	-.109	-1.146	.254

* $p<.05$, ** $p<.01$
Model 1. $R^2= .149$, $p= .002$
Model 2. $R^2= .160$, $R^2Change=.011$, $p=$ n.s.

This study tested hypothesis four through regression. Amotivation was regressed on physical activity participation while controlling for the effects of gender, race and grade. There

was no significant relationship between amotivation and physical activity. Based on these results, hypothesis four was rejected.

Hypothesis Five

> The relationship between needs satisfaction and physical activity behavior will be mediated by motivation to participate in physical activity.

To preserve continuous pagination, Table 33 is placed between the report of results for hypothesis five. This study tested hypothesis five through a series of linear regression models. The first model accounts for the relationship between controls for gender, race and grade and physical activity participation. The second model adds perceived competence as the only basic needs variable predicting physical activity behavior in the presence of the control variables (b= .163, t=2.396, p=.018). Autonomy support and relatedness were dropped from the predictive model, because neither was predictive of physical activity participation. This second model accounted for nearly 20% of the variation in physical activity participation (R^2=.195), and the addition of perceived competence significantly contributed to this second model (R^2 *Change*=.046). The final model is the mediating model, adding internalized motivation as a predictor of physical activity participation while controlling for the effect of perceived competence.

Table 33.

Testing the direct and indirect effects of internalized motivation and basic needs satisfaction on physical activity participation

	B	SE B	β	t	sig.
Model 1. Control Variables					
Constant	3.887	.421		9.238	
Race DV1 (African American)	-.011	.173	-.008	-.065	.949
Race DV2 (Caucasian)	.123	.173	.093	.710	.479
Gender	-.412	.120	-.315	-3.426	.001**
Grade	-.098	.047	-.192	-2.086	.040*
Model 2. with Basic Needs					
Constant	3.157	.512		6.168	
Race DV1 (African American)	-.033	.169	-.025	-.195	.846
Race DV2 (Caucasian)	.107	.170	.081	.633	.528
Gender	-.355	.120	-.271	-2.955	.004**
Grade	-.094	.046	-.186	-2.056	.042*
Perceived Competence	.163	.068	.220	2.396	.018**
Model 3. with Intrinsic Motivation					
Constant	2.974	.504		5.897	
Race DV1 (African American)	.021	.166	.016	.129	.898
Race DV2 (Caucasian)	.201	.170	.151	1.185	.239
Gender	-.307	.119	-.234	-2.586	.011*
Grade	-.108	.045	-.212	-2.392	.019*
Perceived Competence	-.025	.100	-.033	-.246	.806
Intrinsic Motivation	.221	.089	.345	2.496	.014*

* $p<.05$, ** $p<.01$
Model 1. $R^2= .149$, $p= .002$
Model 2. $R^2= .195$, $R^2Change=.046$, $p= .018$
Model 3. $R^2= .160$, $R^2Change=.048$, $p= .014$
Note: Autonomy Support and Relatedness were removed as these variables did not meet the assumptions of mediation testing

The final model tests the relationship between perceived competence and physical activity participation when including intrinsic motivation as a predictor of physical activity behavior. When introducing intrinsic motivation into the model the regression coefficient for perceived competence diminished and was no longer significantly predictive of physical activity participation. The unstandardized regression coefficient for perceived competence went from .163 with perceived competence alone in Model 2 to -.025 when intrinsic motivation was included in Model 3.

A Sobel test examined the mediating role of intrinsic motivation (Baron and Kenny, 1986) using procedures identified by Venkatraman (1989). The test for mediation was significant (t=2.704, p=.007). Meaning that intrinsic motivation mediates the indirect effects of perceived competence on physical activity behavior. The effects of perceived competence on physical activity participation is channeled through perceived competence's support for intrinsic motivation. Note that support for hypothesis five only applies to perceived competence and not the other basic needs variables: autonomy support or relatedness, as these two variables failed to meet the criteria for mediation analysis. The final model (i.e., Model 3) accounted for 24% of the variation in physical activity participation (R^2=.243), and the addition of intrinsic motivation significantly contributed to the model (R^2 *Change*=.048).

Table 34 provides an overview of each hypothesis, to what extent each was supported and a summary conclusion.

Table 34

Summary of Hypothesis Testing

Hypothesis	**Support?**	**Conclusion**
1. Perceptions of need satisfaction will be positively related to intrinsic motivation to participate in physical activity	Partial	Of the three basic needs variables, only perceived competence and autonomy support predicted intrinsic motivation for physical activity
2. Perceptions of need satisfaction will be negatively related to amotivation to participate in physical activity	Partial	Of the three basic needs variable, only perceived competence was negatively related to amotivation. Interestingly, relatedness was found to positively predict amotivation.
3. Intrinsic motivation to participate in physical activity will be positively related to physical activity	Yes	There was significant predictive relationship between intrinsic motivation and physical activity
4. Amotivation to participate in physical activity will be negatively related to physical activity behavior.	No	No significant relationship between amotivation and physical activity could be established
5. The relationship between needs satisfaction and physical activity behavior will be mediated by intrinsic motivation to participate in physical activity	Partial	The indirect effect of perceived competence was mediated by intrinsic motivation when predicting physical activity participation

CHAPTER V: CONCLUSION AND DISCUSSION

This chapter presents a summary of procedures, conclusions, discussion, and recommendations from this study, which examined how supports for autonomy, competence and relatedness are related to the performance of physical activity behaviors among youth. This study examined specifically how intrinsic motivation mediates the relationship between supports for basic psychological needs and performance of physical activity behaviors.

Summary of Procedures

Data were collected using an electronic questionnaire administered by school officials. The electronic questionnaire was prepared with the intention of examining the research objectives. Data from 115 respondents were collected and analyzed. The questionnaires utilized a seven-day recall for physical activity participation, motivation for physically active behavior and assessments of supports for basic needs (i.e., autonomy, relatedness, and competence) in sport, exercise and physical education classes. Males comprised 52.6% of the total sample and the average age of the sample was approximately 13 years old.

Study Conclusions

Study conclusions are presented in order of hypothesis with a summary of results.

Hypothesis One: *Perceptions of need satisfaction will be positively related to intrinsic motivation to participate in physical activity.*

There was partial support for this hypothesis. Two of the needs satisfaction variables, autonomy support and perceived competence, were positively related to intrinsic motivation to

participate in physical activity. Null hypothesis one was rejected because no support for the relationship between relatedness and intrinsic motivation was observed.

Hypothesis Two: *Perceptions of need satisfaction will be negatively related to amotivation to participate in physical activity.*

There was partial support for this hypothesis. The basic need, perceived competence, was negatively related to amotivation to participate in physical activity. However, the basic need, relatedness, was positively related to amotivation, while autonomy support demonstrated no relationship with amotivation. Null hypothesis two was rejected.

Hypothesis Three: *Internalized motivation to participate in physical activity will be positively related to physical activity.*

As hypothesized, internalized motivation to participate in physical activity was positively related to physical activity. Therefore, null hypothesis three was not rejected.

Hypothesis Four: *Amotivation to participate in physical activity will be negatively related to physical activity behavior.*

Amotivation to participate in physical activity demonstrated no relationship to physical activity behavior, meaning that adolescents participated in physical activity while amotivated. Therefore, null hypothesis four was not rejected.

Hypothesis Five: *The relationship between needs satisfaction and physical activity behavior will be mediated by motivation to participate in physical activity.*

There was partial support for this hypothesis. Perceived competence was the only one of the three basic needs that met the criteria for mediation testing. Mediation testing suggested that intrinsic motivation mediated the effect of perceived competence on physical activity participation, meaning that the indirect effects of perceived competence on physical activity participation were channeled through intrinsic motivation. Figure 2 illustrates how intrinsic motivation mediates the indirect effects of perceived competence on physical activity participation.

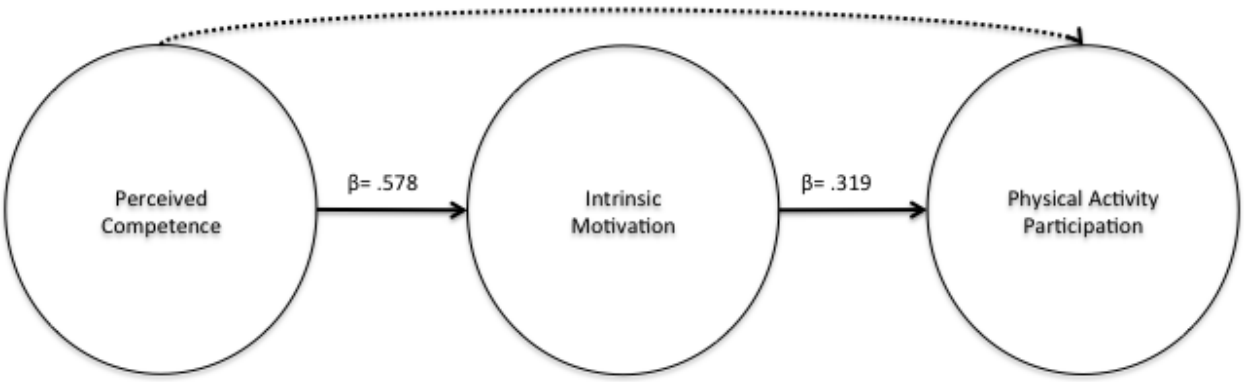

Figure 2. *Mediating Model for Physical Activity Participation*

Study Limitations

This study used a convenience sample of students from one middle and one high school in eastern North Carolina. Results from this study cannot be generalized beyond the sample. Furthermore, the study cannot isolate effects related to seasonal variations in behavior or account for the effect of interventions currently in place to support physical activity behaviors. While the study controlled for developmental variation related to gender, age or grade in school, and

race/ethnicity, it did not test the interactive effects of these variables with the variables under study.

Discussion

The purpose of this study was to examine how supports for autonomy, competence and relatedness are related to the performance of physical activity behaviors among youth. The first aim of the study was to examine if perceptions of need satisfaction were positively related to intrinsic motivation to participate in physical activity. The results show that there were positive relationships between need satisfaction and intrinsic motivation. Specifically, perceived competence showed a strong positive relationship for youth being physical active. Autonomy support also showed a positive relationship with physical activity participation. There was no observed relationship between relatedness and physical activity participation.

The Self-determination Theory (SDT) literature states that all three basic needs play a role in whether an activity is intrinsically motivating or regulated internally based on some value or goal orientation (Ryan & Deci, 2000). The results of this study are reflective of the SDT subtheory, cognitive evaluation theory (CET). CET focuses on competence and autonomy as fundamental needs for intrinsic motivation (Ryan & Deci, 2000). CET states that social-contextual processes, such as feedback through communication and rewards, contribute to feelings of competence (Ryan & Deci, 2000). Ryan and Deci (2000) explain that competence enhances intrinsic motivation because it feeds into intrinsic outcomes related to accomplishment and effectance. However, competence alone is not enough to facilitate intrinsic motivation. Individuals need to feel what DeCharms (1968) terms, "internal perceived locus of causality," or simply, feelings that one's actions are responsible for the performance feedback occurring through activity (Ryan & Deci, 2000). Ryan and Deci (2000) explain further that autonomy

represents the degree to which one attributes control and choice within these activities and represents this attribution.

Relatedness, as explained by the SDT sub-theory, Organismic Integration Theory (OIT), is more important to the process of internalization (Ryan & Deci, 2000). Relatedness is often linked to social connectedness and social support (Ryan & Solky, 1996). The presence of social support often explains why individuals attempt new behavior; support for autonomy and competence explain why individuals continue behavior (Ryan & Deci, 2000). When considering the age of the participants (i.e., between 11-17 years, average age 13.43 years) and the types of physical activities mentioned, the likelihood that activities were new or foreign was minimal. This suggests that entry into physical activity due to social connectedness and support is unlikely for this age group. The findings support choices based on perceived competence and autonomy, which are needed for persistence and long-term behavioral engagement (Ryan & Deci, 2000).

The second aim of this study was to examine if perceptions of needs satisfaction were negatively related to amotivation to participate in physical activity. Again, there was partial support for this hypothesis, as perceived competence was negatively related to amotivation. Interestingly, relatedness was positively related to amotivation, and autonomy support demonstrated no relationship with amotivation.

Youth who perceived a lack of physical competence usually find physical activity meaningless (Ntoumanis, 2001). This can lead to youth becoming less physically active and more susceptible to the chronic illnesses associated with overweight and obesity. Relatedness is often a reason for continuing an activity, and it may be that the presence of friends factored more into activity participation than the desire or motivation to participate in the activity. In other words, the presence of peers supported youth who reported higher levels of amotivation. The

result for autonomy support is curious, because amotivation often emerges from situations in which we lack intention to act (Ryan & Deci). Amotivation occurs during instances where one does not value the activity, feels incompetent, or the activity does not yield an outcome that is desirable for participation (Ryan & Deci, 2000). To this end, the researcher would have expected to observe a negative relationship between autonomy support and amotivation.

The third hypothesis stated that intrinsic motivation to participate in physical activity would be positively related to physical activity. This hypothesis was accepted, as the positive relationship between intrinsic motivation and physical activity participation was observed. As reviewed, intrinsic motivation implies that an individual engages in an activity for the pleasure and satisfaction inherent in the activity (Deci & Ryan, 2002). Ryan and Deci (2000) state that intrinsic motivation is key to prolonged activity engagement, and is evident in those activities where participation occurs for enjoyment. There are three goals that are truly intrinsic: wanting to know, wanting to accomplish, or needing to experience stimulation.

Wanting to know implies that an individual gets satisfaction from learning and understanding (Deci & Ryan, 2002). Accomplishment refers to gaining pleasure from completion of a task or surpassing a goal one has set (Deci & Ryan, 2002). Experiencing stimulation occurs when an individual engages in activity because it appeals to one of the senses (Deci & Ryan, 2002). These three factors explain why intrinsic motivation occurs and why people continue to participate in activities. In this study, intrinsically motivated youth were likely to participate in physical activity as it offered some of these same motives. Conversely, youth who reported lower levels of intrinsic motivation were likely lower on their reports of physical activity participation. The experiences within physical activity lacked fulfillment of knowledge, accomplishment and stimulation for these youth.

The fourth hypothesis stated that amotivation to participate in physical activity would be negatively related to physical activity behavior. This hypothesis was rejected. Past studies demonstrate that amotivation can lead youth to limiting or stopping physical activity behavior (Vallerand, Pelletier, Blais, Brière, Senécal, & Vallières,1992). However, amotivation is a state of being and one can be amotivated while participating in an activity. This runs the risk of youth developing diseases related to overweight and obesity, because youth will eventually drop out of activities or choose not to participate in activities because they cannot find any personal relevance (i.e., internalize the behavior) or support for competence or autonomy within an activity. It may be that some youth in this sample have already stopped participating in leisure-time physical activity, because it is unfulfilling and lacks personal meaning to these individuals.

The fifth hypothesis explored the relationship between needs satisfaction and physical activity behavior. Specifically, this study examined if perceived competence was mediated by intrinsic motivation to participate in physical activities. There was no statistical support to include relatedness or autonomy support in this meditational testing, and so, the effects of each were removed.

Past studies provide evidence that the three basic needs (i.e., autonomy, relatedness and competence) help initiate physical activities in leisure time and often lead to continued physical activity participation (Cox, Smith, & Williams, 2008; Ntoumanis, 2001; Standage, Ntoumanis, & Duda, 2003). However, these studies also support the notion that, over time, continuing physical activity often relies on perceived competence. Cox, Smith and Williams (2008) found that while the three basic needs were important for initiating of behavior, autonomy and relatedness showed less stability over time as a predictor of continued participation. Competence remained as a stable predictor over time in this same study (Cox et al., 2008). Ntoumanis (2001) and Standage

et al. (2003) found that perceived competence is a major psychological mediator, and linked competence to prolonged participation in physical activities. These findings have a clear link to this study, especially when considering the age of the sample and some of the issues around identity development in early adolescence.

The majority of participants in this sample could be classified as early adolescents. Early adolescence is generally bound between the ages of 10 and 13, and is usually marked by a change in self-conception and gravitation toward peers and away from parents (Steinberg, 2002). The appearance of being incompetent or competent often guides appraisals of self-esteem (Harter & Whitesell, 2001). Incompetence or perceived lack of competence is also cited as a reason for discontinuing activities (Ryan & Deci, 2000). It would appear that, for this sample of early adolescents, competence played a significant role in their motivation to participate in physical activity. In turn, intrinsic motivation partially accounted for why some youth participate in physical activity more than others. For youth who felt competent in physical activity, sports and exercise during leisure was desirable. These situations offered opportunities for youth to achieve intrinsic outcomes related to achievement, effectance, and stimulation. Students who felt incompetent were likely denied these outcomes, and demonstrated lower levels of leisure-time physical activity participation. For administrators and practitioners, the implications are clear, programs in and after school need to facilitate situations where youth learn to value and internalize those values that promote physical activity. Administrators and practitioners can do this by supporting situations where youth feel competent and ascribe success and development in these activities to their actions.

Implications for Practice

Internalizing the importance of being physically active at an early age can help ward off illnesses related to overweight and obesity. Youth who are able to internalize the importance of physical activity tend to more physically active. Teachers and parents have a major influence on youth to engage in physical activities. Youth look up to their teachers and parents, and tend to take social cues from the behavior of these role models. Teachers and parents that model sedentary lifestyles are demonstrating harmful behavior for youth. Constant praise and appropriate modeling from teachers and parents has the potential to positively impact opinions and feelings toward physical activity (Deci, Vallerand, Pelletier, & Ryan, 1991). Programs should not only emphasize positive values and norms around activities for youth, but should also continue to emphasize the importance of models in developing social norms. Teachers and parents need to understand that their behavior is constantly being watched, and that support of normative behavior often comes from their action or inaction, particularly with physical activity participation (Teixeira, Carraca, Markland, Silva, & Ryan, 2012).

Practitioners can have a major influence on recreation programs for all ages. More focus should be directed towards teaching and training coaches on providing praise, encouragement, and motivating participants. Practitioners should develop programs that place youth in situations where they can be successful. Too often, physical activity programs assume a level of fitness and developmental readiness, and this is a constant generalized to all youth. Practitioners can implement developmental programs where basic skills are taught so that youth can build their confidence and abilities.

Programs should focus on activities that promote life-long physical activity, and avoid embarrassment because activities require levels of strength, endurance, and balance that not all

individuals possess. Practitioners can introduce programs that can continued through one's life like walking, bike riding, and swimming. A life-long leisure focus and introduction of activities that appeal to a broad array of interests and skill sets is a strategy for success in the aim to promote physical activity.

Recommendations for Future Studies

Future studies should examine specific programmatic approaches that appeal to a variety of abilities and skill sets. Longitudinal studies should also focus on factors that lead to the adoption of and continuation of behavior, and should aim to determine drop out or continuation decisions. Approximately 24% of the variation in physical activity participation was predicted in the final model, which means that there is still a substantial amount of variation unexplained for this behavior. As this was a rural population, it is recommended that studies examine the role of constraints and physical activity participation. Furthermore, a mixed-methods approach that examines the role of significant others (parents, coaches, teachers, and peers) in supporting physical activity is also warranted.

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APPENDIX A: INSTRUMENT

Hyde County School Survey Spring 2011

Please read the following:

You are taking part in this study to help your school understand how to best serve the students who attend it. This questionnaire should take no more than 20 minutes to complete. There are three important things you should know before you begin:

1. All answers are confidential. This means that your identity is protected. All of your answers will be combined with others at school to help us know what life and school is like for all students.

2. Answering these questions is voluntary. This means you can choose not to answer any question that makes you feel uncomfortable. You can also stop answering questions at any time. However, we would really appreciate it if you could fill out as much of the question form as possible.

3. We would appreciate it if you answered your questions honestly. THIS IS NOT A TEST. There are no right or wrong answers to these questions. We want to learn about you and others at school. This will help make school a better place.

Question 1: ID Number In the box provided, enter the ID number that was assigned to you by your teacher:

Question 2: Student Gender. Are you (select one choice):

- ❍ Male
- ❍ Female

Question 3: What grade are you in?:

- ❍ 6th grade
- ❍ 7th grade
- ❍ 8th grade
- ❍ 9th grade
- ❍ 10th grade

Question 4a: How old are you? (Number of years)

Question 4b: How would you describe your ethnic background

- ❍ African-American or Black
- ❍ Asian or Pacific Islander
- ❍ Latino/Hispanic
- ❍ White
- ❍ Other (describe in the box below)

Question 4c. If you answered other for question 5b, please describe your ethnic background below, otherwise skip to page 2

Please click the >>> button to continue to the next page.

EXTERNAL REVIEW NOTE (DOES NOT APPEAR ON ELECTRONIC COPY):
--PAC-Q Questions to assess level of physical activity

Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one circle per row)

	No	1-2	3-4	5-6	7 times or more
Weight Lifting	❍	❍	❍	❍	❍
Rowing/canoeing	❍	❍	❍	❍	❍
In-line Skating	❍	❍	❍	❍	❍
Tag	❍	❍	❍	❍	❍
Walking for exercise	❍	❍	❍	❍	❍
Bicycling	❍	❍	❍	❍	❍
Jogging or running	❍	❍	❍	❍	❍
Aerobics	❍	❍	❍	❍	❍
Swimming	❍	❍	❍	❍	❍
Baseball, softball	❍	❍	❍	❍	❍
Dance/cheerleader	❍	❍	❍	❍	❍
Hunting	❍	❍	❍	❍	❍
Football	❍	❍	❍	❍	❍
Martial Arts	❍	❍	❍	❍	❍
Frisbee	❍	❍	❍	❍	❍
Skateboarding	❍	❍	❍	❍	❍
Soccer	❍	❍	❍	❍	❍
Street hockey	❍	❍	❍	❍	❍
Volleyball	❍	❍	❍	❍	❍
Basketball	❍	❍	❍	❍	❍
Cross country	❍	❍	❍	❍	❍
Other physical activity 1 (explain below)	❍	❍	❍	❍	❍
Other physical activity 2 (explain below):	❍	❍	❍	❍	❍

List other physical activity 1:

List other physical activity 2:

In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? (Check one only)

- ❍ I don't do PE
- ❍ Hardly ever
- ❍ Sometimes
- ❍ Quite often
- ❍ Always

In the last 7 days, what did you do most of the time at recess?

- ❍ Sat down (talking, reading, doing schoolwork)
- ❍ Stood around or walked around
- ❍ Ran or played a little bit
- ❍ Ran around and played quite a bit
- ❍ Ran and played hard most of the time

In the last 7 days, what did you normally do at lunch (besides eating lunch)? (Check one only.)

- ❍ Sat down (talking, reading, doing schoolwork)
- ❍ Stood around or walked around
- ❍ Ran or played a little bit
- ❍ Ran around and played quite a bit
- ❍ Ran and played hard most of the time

In the last 7 days, on how many days right after school, did you do sports, dance, or play games in which you were very active? (Check one only)

- ❍ None
- ❍ 1 time last week
- ❍ 2 or 3 times last week
- ❍ 4 times last week
- ❍ 5 times last week

In the last 7 days, on how many evenings did you do sports, dance, or play games in which you were very active? (Check one only.)

- ❍ None
- ❍ 1 time last week
- ❍ 2 or 3 times last week
- ❍ 4 or 5 last week
- ❍ 6 or 7 times last week

On the last weekend, how many times did you do sports, dance, or play games in which you were very active? (Check one only)

- ❍ None
- ❍ 1 time
- ❍ 2-3 times
- ❍ 4-5 times
- ❍ 6 or more times

Which one of the following describes you best for the last 7 days? Read all five statements before deciding on the one answer that describes you.

- ❍ All or most of my free time was spent doing things that involve little physical effort
- ❍ I sometimes (1-2 times last week) did physical things in my free time (for example played sports, went running, swimming, bike riding, did aerobics)
- ❍ I often (3-4 times last week) did physical things in my free time
- ❍ I quite often (5-6 times last week) did physical things in my free time
- ❍ I very often (7 or more times last week) did physical things in my free time

Mark how often you did physical activity (like playing, sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday	❍	❍	❍	❍	❍
Tuesday	❍	❍	❍	❍	❍
Wednesday	❍	❍	❍	❍	❍
Thursday	❍	❍	❍	❍	❍
Friday	❍	❍	❍	❍	❍
Saturday	❍	❍	❍	❍	❍
Sunday	❍	❍	❍	❍	❍

Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

❍ Yes
❍ No

If Yes, what prevented you?

CODE KEY FOR EXTERNAL REVIEW (DOES NOT APPEAR ON ELECTRONIC COPY):
Motivation Types (IM=Intrinsic Motivation; IR=Internally Regulated ; AM=Amotivation)

Complete the sentence with each statement and select the answer that best fits you.

I take part in sport or exercise...	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Because sport or exercise is fun (IM)	❍	❍	❍	❍	❍
Because of the enjoyment I feel when playing a sport or exercising (IM)	❍	❍	❍	❍	❍
Because sport or exercise is exciting (IM)	❍	❍	❍	❍	❍
Because playing a sport or exercising makes me feel good (IM)	❍	❍	❍	❍	❍
Because it is important for me to be good at sports or exercising (IR)	❍	❍	❍	❍	❍
But I can't see any good coming from playing a sport or exercising (AM)	❍	❍	❍	❍	❍

I take part in sport or exercise...	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
Because I want to improve in sport or exercise (IR)	❍	❍	❍	❍	❍
But I really don't know why I am playing a sport or exercising (AM)	❍	❍	❍	❍	❍
Because playing a sport or exercising keeps me fit (IR)	❍	❍	❍	❍	❍
But I don’t see why I should play sports or exercise (AM)	❍	❍	❍	❍	❍
Because I enjoy learning new skills through sports or exercise (IR)	❍	❍	❍	❍	❍
But I feel like I am wasting time when I play a sport or exercise (AM)	❍	❍	❍	❍	❍

CODE KEY FOR EXTERNAL REVIEW ONLY (DOES NOT APPEAR ON ELECTRONIC COPY):
Basic Needs Satisfaction (AS=Autonomy Support; PC=Perceived Competence; R=Relatedness)

Complete the sentence with each statement and select the answer that best fits you

	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
I think I am pretty good at sport or exercise (PC)	❍	❍	❍	❍	❍
I am pretty skilled in sports or exercise (PC)	❍	❍	❍	❍	❍
I have my say in what sports or exercise I do (AS)	❍	❍	❍	❍	❍
Playing sports or exercising makes me feel close to other kids my age (R)	❍	❍	❍	❍	❍
After playing sports or exercising for awhile, I feel good about myself (PC)	❍	❍	❍	❍	❍
I can decide what sports or exercise I want to do in my free time (AS)	❍	❍	❍	❍	❍
The sports or exercise I do in my free time makes me feel more connected to other kids my age (R)	❍	❍	❍	❍	❍
I can decide what activities I want to practice in PE class (AS)	❍	❍	❍	❍	❍
When I am in PE class, I feel closer to other students (R)	❍	❍	❍	❍	❍

APPENDIX B: IRB APPROVAL LETTER

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
Office for Human Research Integrity
IL-09 Brody Medical Sciences Building • 600 Moye Boulevard • Greenville, NC 27834
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb

Date: July 28, 2011

Principal Investigator: Justin Moody, Graduate Student
Dept./Ctr./Institute: Health and Human Performance
Mailstop or Address:

RE: **Exempt Certification**
UMCIRB# **11-0482**
Funding Source: Unfunded

Title: Assessment of how internalized forms of motivation mediate the relationship between supports for basic psychological needs and physical activity behaviors.

Dear Justin Moody:

On 7/27/11, the University & Medical Center Institutional Review Board (UMCIRB) determined that your research meets ECU requirements and federal exemption criterion #1 which includes research conducted in established or commonly accepted educational settings, involving normal educational practices, such as research on regular and special education instructional strategies, or research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

It is your responsibility to ensure that this research is conducted in the manner reported in your Internal Processing Form and Protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB Office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification Request at least 30 days before the end of the five year period.

Sincerely,

Chairperson, University & Medical Center Institutional Review Board

Cc: Dr. Clifton Watts