

Predictors of Attitudes toward Physical Activity as a Function of Secondary School
Physical Education Experiences among Adults

by

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of the Requirements for the Degree of
Doctor of Philosophy
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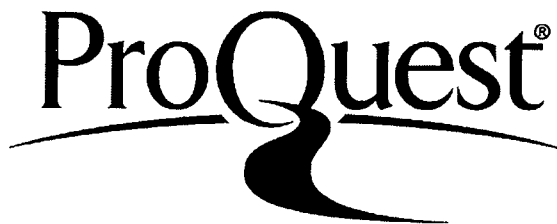
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Monica O'Rourke

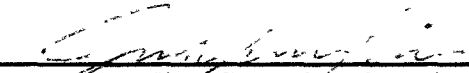
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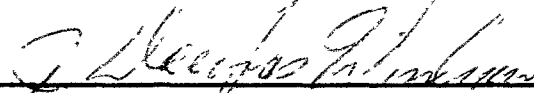
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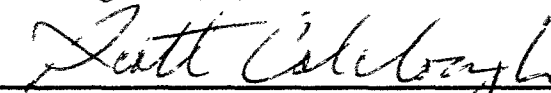
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Dedication

Completing this journey would not be possible without my Lord and Savior Jesus Christ. Thank you Jesus! I'd still be sleeping on park benches if God did not bless me with the love and support of my many families and friends. Thank you all for believing in me. This is dedicated to Courtney, Kendall, Mitchell, all my nieces, nephews, every student I had and will have the privilege to teach, and most importantly my boy, Zack. If I could earn a Ph.D., then there are no limits for you if you believe and try with all your might. "May your light so shine before men, that they may see your good works and glorify your Father in heaven." ~Matthew 5:16

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I am forever indebted to my many families that have loved and supported me along the way. A big thank you goes to my husband Brian for the sacrifices he made to support me throughout this process. Thank you handsome for your encouragement. I also thank my Huft family who plucked me out of despair and established the importance of education. Thanks Cathy Huft, for pulling me literally by the ear and telling me "You WILL go to school." In addition, I cannot forget my momma, Chris Brown, who called me "Dr. Patino" while I was just 14 years old. Thank you for believing in me when I thought you were "crazy." By the way, will "Dr. O'Rourke" do? Thanks, Robin Arend, who for some reason or another decided to take me under her wing and made sure I learned a firm lesson in not giving up. It is no wonder she ended up an educator and today a school principal. And great thanks to my buddy, Jason Cavnar, who, while I was in college, insisted I stop typing on a word processor and get a computer! Finally, going far and beyond their role as a family, the Miller's, who decided to adopt me into their family, supported me throughout my education, all the while teaching me what unconditional love is all about. Thank you, each and every one of you.

Abstract

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The purpose of this study was to examine the extent to which adult attitudes toward physical activity (AATPA) is a function of secondary school physical education experiences (SSPEE). A 55-item online survey was used to ascertain adults' current attitude toward exercise based on their experiences as secondary school students. The Situational Motivation Scale (Guay, Vallerand, & Blanchard, 2000) and Academic Emotions Questionnaire (Pekrun, Goetz, Titz, & Perry, 2002) were administered to 700 adults, ages 18 to 77 ($M = 41.5$, $SD = 11.7$). A hierarchical multiple linear regression (MLR), tested five models, including perceived competence (PC) and intrinsic motivation (IM). Results indicated attitudes toward experiences in secondary school physical education (PE) predicted exercise behavior. MLR analysis indicated a significant relationship between SSPEE and AATPA ($p = .000$). In particular, negative experiences in secondary school PE were related to negative attitudes toward physical activity. Further, PC ($p = .002$) and IM ($p = .000$) during SSPEE predicted AATPA, however, SSPEE was not significant to AATPA when PC was entered into the model. One implication of this study is that secondary school PE programs are not successful in promoting positive attitudes toward physical activity, partly explaining decisions by adults to lead a sedentary lifestyle. Physical education teacher education (PETE) programs need to teach PE majors strategies for promoting lifelong physical activity, and enhance student intrinsic motivation and perceived competence in secondary school PE programs.

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Chapter I

Introduction

Physical activity (any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above basal level that enhances health and produces health benefits), aids in maintaining good health and is known to reduce body fat, reduce hypokinetic-related illnesses, increase energy, and improve metabolism (Ogden et al., 2006; Siedentop, 2007; USDHHS, 2008). Researchers have jointly concluded that physical activity is a key function of health and the prevention of disease (Darst & Pangrazi, 2006; Desha, Ziviani, Nicholson, Martin, & Darnell, 2007; Landers & Arent, 2007). Despite the numerous health benefits of participating in lifelong physical activity adult obesity is still prevalent. Moreover, studies have shown that adults are unlikely to change their unhealthy habits even though they have been well-informed about the health risks and dangers of obesity (Rodgers, Hall, Wilson, & Berry, 2009; Sykes & McPhail, 2008). Consequently, health experts seek innovative strategies to increase physical activity among adolescents and adults.

The promotion of physical activity has received increased attention in recent years due to the unmistakable increase of child and adult obesity. Interventions have been used to promote lifelong health enhancing physical activity in private and public settings. Barkoukis, Tsorbatzoudis and Grouios (2008) reported in their seven month motivation intervention study that intentional affirming of motivation had a positive effect on participants' intrinsic motivation (IM) and physical activity. On the other hand, Hagstroemer, Elmberg, Marrild, and Sjoestroem (2009) conducted a clinical research

study in a hospital setting to treat obese adolescence resulted in vast dropout rates and found it difficult to motivate obese participants. Hagstromer and colleagues suggest interventions in a learning environment such as in schools would be less intimidating, less expensive, and perhaps more successful. This brings forth one conceptual framework in physical activity literature suggesting the reason for sedentary lifestyles is attitudes toward physical activity.

Previous studies indicate adults do not change their activity patterns primarily due to their attitude toward physical activity (Dishman, Sallis, & Orenstein, 1985; Wrench & Garrett, 2008). Studies further suggest regular exercise is guided by the individual's motivation and perceived competence (PC) which in turn impacts physical activity and sports participation patterns (Anshel, 2003; Chen & Hancock, 2006; Lodewyk, Gammage, & Sullivan, 2009; Trout & Graber, 2009; Vallerand, 2007). It would be reasonable to suggest that adolescent experiences in which motivation and PC are ascertained influence physical activity motivation and perceived competence in adulthood. Although attitudes toward physical activity in children and adults have been studied (Nupponen, Laakso, Rimpela, Pere, & Telema, 2010; Rodgers, Hall, Wilson, & Berry, 2010), there has been limited research on differentiating the long-term conditions and characteristics of adolescent physical education experiences on attitudes toward physical activity among adults.

Initial educational experiences (learning occurrences that happen for the first time) affect attitudes (Cale, 2005). An important occurrence that may promote favorable or less favorable attitudes toward lifelong physical activity is school physical education. Experts suggest that school physical education can be a source promoting lifelong

attitudes and habits of physical activity, especially for individuals who do not participate in sports programs outside of school (Kirk, 2005; Sallis & McKenzie, 1991; Trout & Graber, 2009). However, limited studies have been conducted to establish a relationship between secondary school physical education experiences and adult attitudes toward physical activity.

There is a need for more research to fully explicate the relationship between secondary school physical education experiences and adult attitudes toward physical activity. Figure 1 provides a conceptual framework for the present study utilizing IM and PC as a theoretical basis for this study. This study examined the extent to which secondary school physical education experiences influence current attitudes toward physical activity among adult men and women. Additional investigation revealed the extent to which PC in physical activity predicts the relationship between secondary school physical education experiences and IM of adult attitudes toward physical activity's influence on past secondary school physical education experiences and past attitudes toward physical education.

Research Questions

1. To what extent do experiences in secondary school physical education classes influence current attitudes toward physical activity among adult men and women?
2. To what extent does perceived competence (PC) in physical activity toward exercise predict the relationship between secondary school physical education experiences and current adult attitudes toward physical activity?
3. What influence does intrinsic motivation (IM) have on secondary school physical education experiences and attitudes toward physical activity as adults?

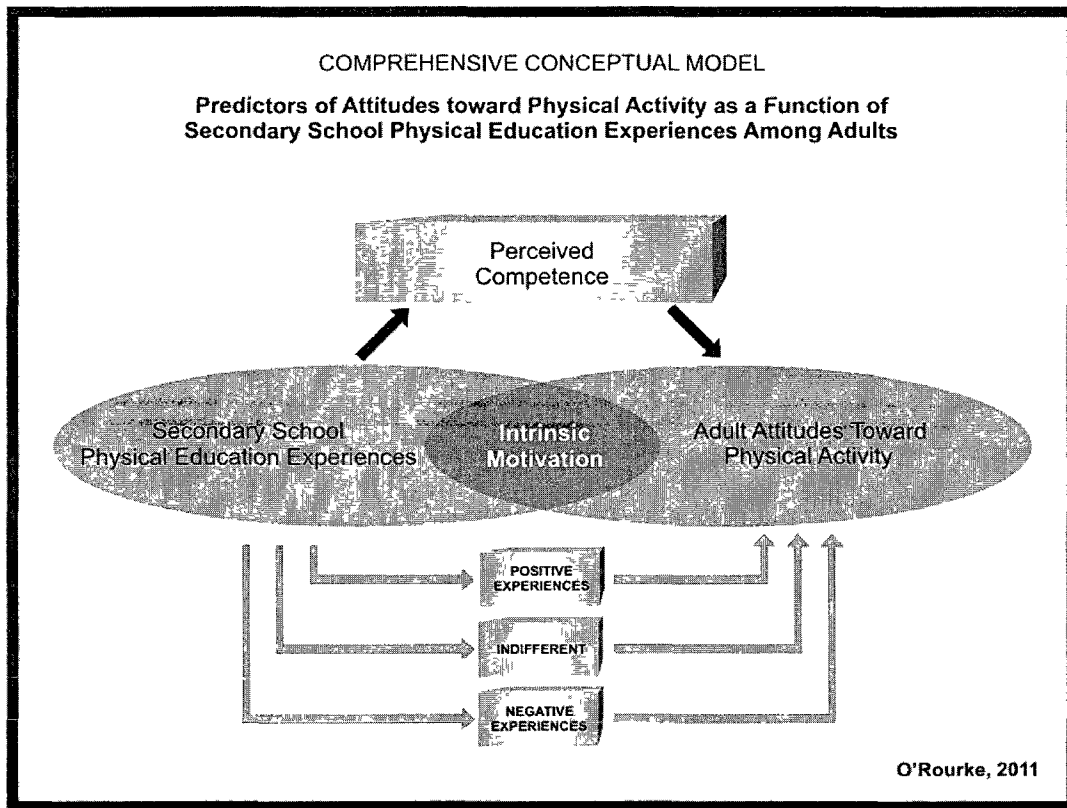


Figure 1. Comprehensive Theoretical Framework Conceptual Model

Purpose of Study

The purpose of this study was to examine the extent to which attitudes toward physical activity in adulthood is a function of secondary school physical education experiences among male and female adults. PC will be measured to determine if PC explains the relationship between adult attitudes toward secondary school physical education experiences and adult current attitudes toward physical activity. Further investigation was conducted to determine the extent to which IM of adult attitudes toward physical activity was related to past emotions regarding physical education experiences and past attitudes toward physical education.

Significance of Study

Presently, U.S. national objectives are focusing on improving the amount of physical activity in youth and adults and decreasing the prevalence of overweight and obese populations (USDHHS, 2008). However, the United States is falling short. It has been shown that the greatest decrease in the amount of daily physical activity occurs after high school graduation (Malina, 2001). With schools as an excellent environment for promoting lifelong physical activity, it is important to examine the relationship between secondary school physical education experiences and adult attitudes toward physical activity.

This study also makes significant contributions to the body of knowledge regarding physical education classes as a tool to improve attitudes toward physical activity. The information the study produces can be used to develop special programs and make curriculum changes which can have a profound effect on the quality of physical education and secondary school students' physical education experiences. In addition, results from this study can assist teachers, administrators and health professionals with important information regarding motivating factors that influence secondary school students' future physical activity behaviors.

Furthermore, this study helps provide physical education teacher education (PETE) programs with insight regarding student motivation and attitudes toward physical education and activity. Results help increase teacher educators understanding concerning the future direction of PETE program's curriculum and teaching strategies. This study is especially promising for future secondary school physical educators that have a desire to increase motivation and lifelong physical activity in students.

Delimitations

1. Internet access was required of the participants to complete the online survey.
Individuals without internet access or the capability of using the Survey Monkey website may not have participated in the study.
2. Only experiences that occurred in physical education classes will be examined, as opposed to athletic participation and after school sports or intramural activities.

Limitations

1. Participants may have experienced inherent limitations of retrospective recall of previous physical education experiences.
2. Mediating variables such as parental persuasion during adolescence, learning style or mood at the time of completing the survey may have influenced the attitudes toward physical activity.
3. Variables such as child and adult socioeconomic status, time availability or athletic participation might have influenced participants' attitudes toward physical activity.
4. Limited computer literacy and low reading skills among participants may have caused a variation in the survey results.
5. Quality of physical education teachers could not be controlled and therefore varied for each participant.

Assumptions

1. Participants had reasonably accurate memory recollection of their secondary school physical education experiences.
2. Participants answered all items in the questionnaire honestly.
3. The modified inventories used in the study to measure attitudes toward physical activity, PC, and secondary school physical education experiences were valid and reliable.
4. All participants in the study engaged in secondary school physical education classes.
5. All participants completed the survey voluntarily without coercion.

Research Hypotheses

The following hypotheses will be tested in this study:

Hypothesis 1

Previous secondary school physical education experiences will be significantly related to adult attitudes toward physical activity among adults, when controlling for gender, age, body mass index (BMI), current exercise participation, medical condition precluding participant from exercising, hours worked per week, years in secondary school physical education, parental influence of exercise during secondary school, athletic participation in secondary school, and body type in secondary school.

Specifically, the extent to which secondary school physical education experiences are negative (i.e., unpleasant, unconstructive, wounding, disparaging) will be significantly related to negative adult attitudes toward physical activity. Thus, adults

who report more negative secondary school physical education experiences will more likely report poorer attitudes toward physical activity.

Hypothesis 2

When controlling for other variables, PC will explain the relationship between secondary school physical education experiences and attitudes toward physical activity among adults.

Hypothesis 3

When controlling for other variables, the type of attitudes toward physical activity will be significantly related to the participants' PC and self-reported attitudes toward secondary school physical education experiences among adults.

Hypothesis 4

When controlling for other variables, IM of adult attitudes toward physical activity will be related to past emotions of secondary school physical education experiences and past attitudes toward physical education.

Operational Definitions

Amotivation: the absence of motivation, self-determined or otherwise (Eklund & Cresswell, 2007).

Attitude: an individual's degree of attraction or desirability toward an item.

Attitudes are generally positive or negative views of a person, place, thing or event.

Attitude can be both negative and positive and therefore in this study will be considered "indifferent." Attitudes are affective in nature and induce an emotional response. Most attitudes result from either direct experience or observational learning from the environment (Breckler & Wiggins, 1992; *Wikipedia*, 2010).

Intrinsic Motivation (IM): a set of behaviors in which a person engages to feel competent and self-determining; conducting a behavior for its enjoyment, pleasure and own sake (Deci, 1975).

Overweight.: an excess of body weight from muscle, bone, fat, or water. Weighing in excess of the normal for one's age, height, and body type (*Medline Plus*, 2010).

Obesity: an abnormal increase of fat in the subcutaneous tissue. Adults that have a BMI of 30 or higher are considered to be obese. Children's BMI equal to or greater than the 95th percentile for their age are considered to be obese. (CDC, 2010a; Stedman, 1990).

Perceived Competence (PC): also called perceived self-efficacy, PC consists of a person's belief in his or her own control to produce a certain level of attainment (Bandura, 1997; Tenenbaum & Eklund, 2007).

Physical activity: any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above basal level that enhances health and produces health benefits (USDHHS, 2008).

Physical education experiences: events in one's life pertaining to the affective domain such as, but not limited to, social, emotional, mental, personal, and attitudinal and secondary school physical education experiences (NASPE, 2004; Sinelnikov & Hastie, 2010).

Physically active lifestyle: a way in which an individual lives her/his life, including specific behaviors in which she/he engages in related to physical health (Lyons & Chamberlian, 2006).

Secondary school physical education: an educational program conducted during school hours by a certified physical education teacher, consisting of bodily movement behaviors, physical exercise, individual and team sports, fitness-based activities, motor learning and motor development, and physical activity skill development (NASPE, 2004).

Chapter II

Review of Literature

Introduction

Physical activity (PA) is defined as any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above basal level that enhances health and produces health benefits (USDHHS, 2008). Physical activity has been examined in relation to preventative measures in obesity-related illnesses and a variety of health settings. The study of PA is not a new concept, however it has received increased attention in recent years due to obesity in youth and adults. It has been studied in relation to performance quality, preventive medicine, longevity in life, motivation, and health promotion. Limited studies have been done on the predictors of attitudes toward PA. Unknown to date is the extent to which secondary school physical education experiences influence attitudes toward PA.

Physical education is based on a sequence of learning. According to the National Association for Sports and Physical Education's (NASPE) 2010 Shape of the Nation Report, physical education are formalized classes taught by professionals which focus on skill and the knowledge needed to establish and sustain an active lifestyle which include, but are not limited to, health, social responsibility, nutrition, and the value of fitness. Class experiences in physical education differ depending on the type of instruction, situation or skill level. For example, student-athletes, who are often well-skilled, perhaps have different physical education experiences from overweight or less-skilled student in class. Due to physical education being a condition of learning skills and knowledge for physically active lifestyles, there is reason to believe experiences in physical education

have influence on adults' attitudes toward PA (see Figure 2). Despite the prevalence of physical education's endorsement of PA, the relationship between secondary school physical education experiences (SSPEE) and adult attitudes toward physical activity (AATPA) has received limited attention by researchers.

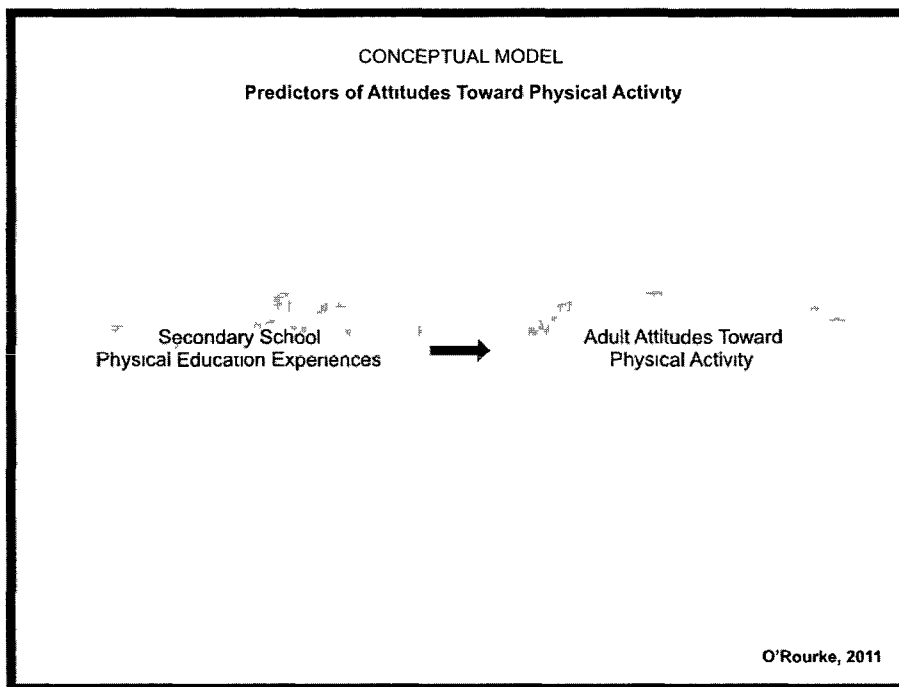


Figure 2. Predictor of Adult Attitudes toward Physical Activity Conceptual Model

This review of literature consists of first an overview of physical activity, sedentary lifestyle and obesity. Next, this chapter focuses on an overview of physical education and physical education experiences. An examination of attitudes toward PA and the possible association between secondary school physical education among adults will be reviewed. Finally, motivational theories that explain the study's conceptual framework include intrinsic motivation and perceived competence as well as the role

intrinsic motivation and perceived competence might have on adult physical activity attitudes and physical education experiences in secondary school.

Overview of Physical Activity

The term physical activity (PA) has undergone immense change in the recent years. The definition change began when obesity and sedentary lifestyles not only became more prevalent but an epidemic. No longer is physical activity simply “any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above basal level” (USDHHS, 2008). The United States Department of Health and Human Services 2008 Physical Activity Guidelines for Americans defines physical activity as “health-enhancing physical activity” which includes “any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above basal level that enhances *health and produces health benefits*” [emphasis added].

There are many benefits to PA. It is well established that regular health enhancing PA has many physical health benefits such as, but not limited to; (a) improved cardiorespiratory and muscular fitness, (b) lower risk of early death, depression, stroke, high blood pressure, type 2 diabetes, colon and breast cancer, and (c) the prevention of weight gain and injuries (Desha, Ziviani, Nicholson, Martin, & Darnell, 2007; NASPE, 2010; USDHHS, 2008). More recently studies have revealed that PA also benefits mental health such as improving one’s mood and reducing symptoms of depression and anxiety (Colcombe & Kramer, 2003; Landers & Arent, 2007; Sibley & Etnier, 2003).

Tyson, Wilson, Crone, Brailford and Laws (2010) study of university students and the relationship of PA and mental health revealed significant differences in the

mental health scales between low to high exercise groups. Evidence supported that PA can be a contributory factor in positive mental health. Another benefit of PA and mental health results in the enjoyment of PA. Berger (2008) reported PA leads to personal motivation and therefore increases PA. Parker, Martin, Martinez, Marsh, & Jackson (2010) reported in their “stages of change” in physical activity study motivation and self-concept was associated to increased PA. When participants progressed from pre-contemplation to maintenance stages in PA, their self-concept and motivation to participate in PA increased.

Unfortunately PA benefits alone have not changed sedentary behavioral patterns of adults. The lack of PA or sedentary lifestyle (a lifestyle that is relatively void of physical activity), can result in major health problems and in extreme cases lead to death. According to the National Institute of Diabetes and Digestive and Kidney Disease (2005), diabetes, hypertension, coronary heart disease, cancer and obesity, are just a few of the physical consequences of being sedentary or physically inactive. Moreover, medical costs associated with obesity and sedentary illnesses in the U.S are \$147 million dollars a year, resulting in a \$40 million dollar increase in three years (CDC, 2009; Finkelstien, Trogon, Cohen & Dietz, 2009).

Detriments of Obesity

Obesity differs from being overweight. Obesity is the accumulation of abnormal amounts of fat in the subcutaneous tissue (Stedman, 1990) while being overweight is defined as an excess amount of body weight from muscle, bone, fat, or water that is beyond a person’s normal age, height, and build (Medline Plus, 2010). Though obesity and being overweight differ in definition both are associated with sedentary, physically

inactive lifestyles, the rapid increase in health-related illnesses, and psychological and societal problems.

Obesity in the United States continues to increase. The National Center for Health and Statistics (2010) reported in 2007-2008 that 34.2% of U.S. adults over 20 years of age are overweight, 33.8% are obese and 5.7% are morbidly obese. Moreover, adolescent obese and overweight populations statistics are quickly becoming similar to those of overweight and obese adults. Ogden and colleagues (Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006; Ogden & Fliegel, 2007) estimated that 34.3% of adolescence age 12-19 years of age are at risk of being overweight. That is roughly two times as many adolescence at risk for obesity today as were in 1980. More recently the 2009 National Youth Risk Behavior survey confirms nationwide that 12.0% of high school students are obese, 15.8% are overweight, and 27.7% described themselves to be slightly or very overweight (CDC, 2010b).

The rapid increase in rates of obese and overweight adolescent populations suggests it will soon exceed current statistics of obese adults. Substantial evidence has shown the more overweight and obese youth are the more likely they are to become overweight and obese adults (Lee, Burgeson, Fulton, & Spain, 2007; Must, 1996; Nelson, Neumark-Stzainer, Hannan, Sirard, & Story, 2006; Zapata, Bryant, McDermott, & Hefelfinger, 2008). Whitaker, Wright, Pepe, Seidel, & Dietz (1997) collected data of overweight and obese children in schools. Results indicated that overweight children with one or more obese parent reported a 79% likelihood of becoming overweight as an adult.

Another concern is that studies have also shown obesity-related illnesses that were once considered adult-onset diseases such as Type II diabetes and hypertension are

now becoming more prevalent among youth (Graf, Rost, Koch, Heinen, Falkowski, Dordel, 2005; Grey, Berry, Davidson, Galasso, Gustafson, & Melkus, 2004; Katzmarzyk, Gagnon, Leon, Skinner, Wilmore, Rao, et al., 2001). Wang and Dietz (2002) analyzed obesity-related medical costs of youths 6-17 years of age and found an increase cost of more than three-fold. They reported the medical costs for obesity-related illness in youth were \$127 million compared to two decades ago when they were \$35 million. One reason for the increase of medical costs was due to new medical issues and complications obesity in youth have caused. Darst and Pangrazi (2006) indicate since young bodies are still growing, obesity among youth physically complicates growth and creates negative stress on young bodies. Some factors which include, but are not limited to are; orthopedic complications, coronary heart disease, Type II diabetes, and increased stress on weight bearing joints. They recommend additional research in order to seek ways to prevent obesity and promote healthy lifestyles in both adolescence and adults.

Psychological and Social Ramifications of Obesity

Additional detriments of obesity include adverse psychological and social effects. For example, research has shown obese and overweight individuals have increased depression, decreased dating opportunities, and are less likely to marry (Averet & Korenman, 1996; Boyes & Latner, 2009). Studies conducted in the work place contend overweight and obese adults are less likely to be hired or less likely to be promoted to a higher work status in the company they work for. Employers report obese adults are more likely to have chronic absenteeism due to obesity related-illnesses therefore decreasing an employer's desire to hire overweight and obese adults due to the possibility of increased

health insurance costs and absenteeism (Jarrell & Sukrungruang, 2005; Puhl & Brownell, 2006; Rashad, 2003).

Adults are not alone when it comes to the psychological and social ramifications of living overweight and obese lifestyles. Studies have shown overweight and obese adolescence particularly in school settings have been bullied and socially discriminated against by adults (teachers) and students (peers). Bell and Morgan's (2000) investigation of peer behaviors toward obese adolescence reported peers treated obese friends differently. Peer discrimination, peer rejection, and stigmatization were common toward the obese despite the researchers using adolescence that were obese due to medical reasons. The study also reported low-self esteem was more prevalent in the obese youth. Trout and Graber's (2009) examination of overweight youth in physical education programs revealed a prevalence of peer and teacher discrimination. Discrimination included verbal harassment, exclusion of activities, and being selected last on a team. Trout and Graber propose additional research be conducted to determine if peer and teacher rejection in schools might compromise an adolescent's view of oneself as well as future participation in physical activities.

Overall, obesity is among one of the largest threats to health in the United States. Research has demonstrated that the increasing trends of obesity and overweight individuals have placed an economic strain on medical costs due to obesity-related illnesses, as well as psychological and social ramifications for both adults and adolescence. Another concern in regard to obesity is the increasing rate of youth obesity becoming similar or surpassing those of obese adults. This raises serious concern regarding the trends of obesity and lack of PA among the U.S. Consequently there is a

need to understand predictors that cause sedentary lifestyles and to seek solutions that lead to increased PA and healthier behaviors among adults and youth.

Physical Activity Promotion

It has been established that health enhancing PA is (a) beneficial physically and mentally, (b) decreases obesity, and (c) increases overall quality of life. Nonetheless, large numbers of Americans do not engage in regular PA and do not meet the recommended guidelines for daily PA (Ogden et al., 2006; Siedentop, 2007; USDHHS, 2008). The American College of Sports Medicine (ACSM) recommends PA to be at least 30 minutes per day either 5 days per week of moderate-intensity activities or 20 minutes per day, at least 3 days per week of vigorous-intensity activities (Haskell et al., 2007).

Along with adults not meeting the national PA recommendations, studies report as children get older, they do not participate in adequate amounts of PA (Berkey, Rockett, Gillman, & Colditz, 2003; Grunbaum, Kann, Kinchen, Ross, Hawkins, & Lowry, 2004). The 2009 National Youth Risk Behavior survey reports nationwide that only 18.4% of adolescence are engaged in PA that increases their heart rate 60 minutes 7 days a week and 32% of older youth watch television 3 or more hours on an average school day. Therefore it is necessary to seek ways to appropriately promote PA for both adults and youth.

The promotion of physical activity has received extensive attention among health researchers. Most of these studies have investigated health promotion interventions as the main approach to increasing PA (Haveman-Nies, Groot, Bureman, Amorin Cruz, Olser, & van Starveren, 2002; Katz, O'Connell, Njike, Yeh, & Nawaz, 2008). Health

promotion is defined as interventions designed to promote change to improve good health in individuals, communities, and populations, to promote healthy lifestyles, and to prevent the development of disease (Lyons & Chamberlain, 2006). There are two main pathways in which health promotion can be conducted; primary and secondary prevention. Primary prevention is the promotion of healthy lifestyles to prevent development of disease, whereas secondary prevention is the detection, diagnosis and treatment of disease as early as possible in order to prevent further bodily harm.

Primary prevention interventions in health promotion are ideal strategies for increasing PA since it promotes health prior to detection of illness or obesity (Kelly, 2006). Researchers recommend PA interventions that are primary health promotion prevention over secondary which is working with people who are already ill due to obesity (Baranowski, Cullen, Nicklas, Thompson, & Baranowski, 2002; Budd, & Volpe, 2006; Snethen, Broome, & Cashin, 2006). Nonetheless, due to the obesity epidemic, secondary interventions have been conducted to promote PA in overweight and obese populations (Buckworth and Dishman, 2002; Dubert, 2002; Kahn, et al., 2002).

Hagstroemer, Elmberg, Marrild, and Sjoestroem (2009) used a secondary prevention method to conduct a clinical research study in a hospital setting to treat the obese. Medical doctors used weekly exercise as well as anthropometric and accelerometry measurements before and after the intervention periods. Due to the vast dropout rates and difficulty of motivating obese participants, medical doctors conducting the study suggest that primary prevention methods such as school-based interventions would be less expensive and are less intimidating settings for people who are overweight

and obese. Similar results occurred in other secondary prevention intervention studies, with participants that are overweight or obese.

Other interventions such as short-range nutrition programs, fat camps, and lowering BMI have been among some of the interventions used to treat unhealthy behaviors and obesity. Although short-term secondary interventions yield modest but promising results, primary prevention interventions such as education programs over time have more influence on learning and produce more long term results (Budd & Volpe, 2006; Harrison, Burns, McGuiness, Heslin, & Murphy, 2006; O'Rourke, 2009). Overall, researchers that have examined the treatment of obesity within secondary prevention methods contend primary interventions that (a) occur earlier in life, (b) are education based, and (c) include life health education and PA would be more successful than the attempt to reduce body fat in people who are already overweight or obese.

Primary prevention interventions over time that address the prevention of disease have been thought to have more potential for increasing PA. Education settings are thought to be more economically efficient for primary prevention interventions. Wang et al. (2008) analyzed medical costs of obesity related illness versus prevention programs. Results revealed primary prevention health promotion programs, such as physical education programs, are more cost effective when comparing to the costs related to detecting and treating obesity-related illnesses.

There is sufficient evidence that school physical education programs would meet the criteria of an effective primary prevention for increasing PA. Chen and Hancock (2006) reviewed research literature related to adolescent PA interventions and learning behavior change. They assert physical education curriculum and how students interact on

a daily basis in physical education is an environmental factor that has an influence on student PA motivation. Parker, Martin, Martinez, Marsh and Jackson (2010) for example, conducted a study using a primary prevention method with secondary school physical education students and their stages of change toward PA. Findings indicate that students with higher self-concept and positive stage progression or experiences stated they were more likely to be PA. In contrast, students who were reported to have low self concept and PA motivation had negative and poor experiences in PA. Parker and colleagues point out many attitudes and behavioral patterns related to PA are established during school, indicating that the school environment is a prime source for promotion of PA. Researchers recommend more studies conducted to determine if the fostering of lifelong PA patterns established in school physical education classes extends to adult PA behaviors.

Overall, health promoting primary interventions has been used as the principal avenue toward increasing PA and preventing obesity. It has been proposed that educational environments such as physical education classes are more economical and are the best way to increase PA for adolescence. Because research indicates primary interventions in school physical education has a significant impact on PA participation in youth, it is also important to consider the impact it has on adults and PA as well. Based on the need to promote PA and decrease obesity it is necessary to examine reasons why PA is not being conducted.

Secondary School Physical Education

Physical education, as defined by the National Association of Sports and Physical Education (NASPE, 2010), is formalized classes taught by professionals and focus on

skill and knowledge needed to establish and sustain an active lifestyle which include, but not limited to, health, social responsibility, nutrition, and value of fitness. Physical education has been recognized as one of the primary resources to aid in creating healthy PA lifestyles. The World Health Organization (WHO) (2004), reported obesity prevention education, such as secondary school physical education, is a less expensive and more promising method than treating obesity-related diseases. WHO also asserts people need to learn how to move, value PA, make good decisions and avoid risky behaviors. Learning types of healthy behaviors and skills are foundational to lifelong PA and according to physical education professional associations are taught in physical education.

NASPE asserts physical education programs offer the best opportunity to provide PA to all students and to teach skills and knowledge needed to establish and sustain an active lifestyle. According to NASPE, the main objective of school physical education is to develop a physically educated person. A physically educated person defined by NASPE (2004) is a person who has the knowledge, skills, and confidence to enjoy a lifetime of healthful PA. National organizations such as NASPE and American Association for Health, Physical Education, Recreation, and Dance (AAHPERD) publish and endorse national and state standards used to guide and direct physical education content and teaching as well as promote physically educated individuals. Figure 3 illustrates the six national physical education standards with all six standards promoting PA.

The national standards represent three main domains of physical education; (a) psychomotor, (b) cognitive, and the (c) affective domain. The psychomotor domain

(learning based on thinking and doing) is the most prevalent learning domain in physical education, however affective (expressed value given to a feeling or state) and cognitive domains (content knowledge) are equally important in the physical education curriculum. The National Board for Professional Teaching Standards for Physical Education (2001), report quality physical education programs integrate psychomotor, cognitive and affective attributes into the curriculum.

- NASPE National Standards for Physical Education (2004)

 1. Demonstrates competency in motor skills and movement patterns needed to perform a variety of physical activities.
 2. Demonstrates understanding of movement concepts, principals, strategies and tactics as they apply to the learning and performance of physical activities.
 3. Participates regularly in physically activity.
 4. Achieves and maintains a health-enhancing level of physical fitness.
 5. Exhibits responsible personal and social behavior that respects self and others in physical activity settings.
 6. Values physical activity for health, enjoyment, challenge, self-expression and/or social interaction.

Figure 3. NASPE National Standards for Physical Education.

Physical fitness (the capacity to successfully meet the potential physical challenges of life) is an example of a common component in the physical education curriculum. Physical fitness has two types of physical fitness; health-related fitness and skill-related fitness (Buckworth & Dishman, 2002). Health-related physical fitness

include; cardiorespiratory endurance, muscular strength and endurance, flexibility, and body composition. Skill-related fitness differs in that it includes agility, balance, coordination, power and speed. Both types of physical fitness are included in the national standards and are commonly included into the secondary school physical education curriculum in order to promote enjoyment as well as the skills needed for lifelong PA (NASPE, 2004). Therefore it is reasonable to suggest students should be learning not only lifelong PA habits but how to become physically fit as well.

Physical Education Experiences

Research has established that school physical education is one of the primary sources of developing favorable lifelong attitudes and habits of PA especially for individuals who do not participate in sports programs outside of school (Kirk, 2005; Sallis & McKenzie, 1991; Trout & Graber, 2009). Berger and Tobar (2008) measured motivation of secondary school students and their current experiences in physical education class. Results from the study reported students with the more pleasant a memory were more likely be more motivated to participate in activity. They contend PA and exercise enjoyment in youth has the potential to increase participation and adherence to physical activities. Although this supports physical education programs as a primary prevention for PA, research still acknowledges further research is needed to identify if memories of physical education experiences in secondary school physical education influence factors that promote adult PA.

Learning Experiences in Physical Education. The amount of learning experiences taking place in physical education contributes to the promotion of PA. NASPE and AAHPERD organizations assert national standards and physical education

curriculum has the potential to influence PA levels of almost every student in school (Kahn et al., 2002; Sallis & McKenzie, 1991; Tammelin, 2005). Strong evidence supports physical education curricula includes PA promotion, however it is questionable if it is being taught correctly or consistently. Kirk (2005) and other researchers assert physical education has fallen short in promoting lifelong activity habits (Mears, 2007, 2008; Portman, 2003; Trout & Graber, 2009).

Sun and Chen (2010) conducted a school district examination of 6th grade physical education students assessing self-determined motivation, cognitive and psychomotor skills. Results indicate high motivation did not positively contribute to learning achievement. They reported students in physical education had “fun” but were not held accountable for their learning. Sun and Chen and other researchers argue youth, who eventually become adults, are not learning sufficient amount of skills for autonomy in lifetime health and PA. They recommend more research is needed to determine if SSPEE influence AATPA (Azzarito & Solmon, 2009; Cale & Harris, 2009; Carlson, 1995; Rink, Jones, Kirby, Mitchell, & Doutis, 2007).

Wrench and Garret (2008) assert that fitness testing experiences in secondary school physical education are doing more harm than good in promoting PA and fitness. In their study, students reported negative experiences and emotions toward fitness testing and physical education. Results showed low skilled and overweight students experienced public humiliation, embarrassment, and would essentially give up because they perceived to not be as good as their peers. Both high and low-skilled students reported that they felt the main objective in physical education was learning to be competitive among their peers. The study also reported students placed little value on fitness testing in physical

education. Students reported fitness testing to be a “joke” and indicated they had no motivation to improve. Overall, Wrench and Garret reported fitness testing in secondary school physical education was negative and promoted anxiety, hopelessness, shame and even anger. These strong emotions suggest an association to future health behaviors and attitudes. Kahn et al. (2002) and Tammelin (2005) have the same opinion and indicate that children’s physical education experiences perhaps influence adult lifelong activity habits however limited studies have been done to define this relationship. In contrast to the studies conducted on current experiences of secondary school physical education students, long-term effects of SSPEE on AATPA have received relatively little attention.

Student Emotions and Physical Education Experiences. Student emotions in physical education can have a significant role on PA along with learning experiences in physical education. Emotions (reaction to a stimulus in an event and can be expressed through action tendencies) begin with a response to an event that involves physiological changes and subjective experiences (Deci, 1980). Deci (1980) asserts the emotional processes of how one feels toward a behavior is involved in the future motivation of the repeat or similar behavior. Schutz and Pekrun (2007) contend that little is known about emotion in education regarding students’ unpleasant (anger, hopelessness, shame or boredom) and pleasant (enjoyment, hope, or pride) emotions. This lack of inquiry has brought forth interest by scholars. In response to the need for study of emotions in education, studies have been conducted in classroom settings, yet there have been limited studies in physical education experiences, or the emotions and attitudes over time.

Emotional memory systems contain reciprocal connections in the brain that can activate or bring forth stored emotional responses to a task (Lang, 2000). Stored

emotional responses can be negative or positive experiences from the past pertaining to a specific activity. Memory has the capacity to endure an emotional status to a past event, and later on without the need for stimulus, can initiate subsequent behavior. Anshel (2003) suggests that interaction sources of motivation (a combination of personal characteristics and situations) can foster or destroy motivation. For example, a negative exercise experience in physical education could prompt adults to have a negative emotional response toward PA thus resulting in exercise avoidance.

Emotions affect learning in classrooms. Studies have revealed feelings and emotions affect self-determination in physical education and PA among children (Cox, Duncheon, & McDavid, 2009; Murcia, Coll, & Perez, 2009; Yli-Piilpari, Watt, Jaakkola, Liukkeonen, & Nurmi, 2009). Shehu (2009) studied 675 secondary students and their physical education experiences. The study presented accounts of affective behaviors that were hurtful and offensive among children in physical education. Results indicated six overlapping themes; (a) humiliation, (b) injustice, (c) physical assaults, (d) sexual harassment, (e) dangerous play, and (f) gender prejudice. Studies have been conducted on children regarding stored emotional responses. However limited studies have been conducted to determine if stored physical education experiences influence AATPA.

Another facet of student emotions and physical education experiences is the role of physical education teacher. Deci (1980) contends that when dealing with high-risk behavior, such as physical inactivity, building autonomy is more effective when people of influence educate and support autonomy. Deci & Flaste (1995) demonstrate autonomy support as a doctor who promotes their patient to become intrinsically motivated to take responsibility for their own healthy behaviors and avoid being sick as opposed to a doctor

that demeans or leaves the patient with more questions than answers. Deci goes on to assert that students with autonomy supportive teachers are more likely to become more intrinsically motivated to conduct desired behaviors. In contrast, teachers who do not promote autonomy, conceivably produce students that are either extrinsically motivated or not motivated at all.

Sleap and Wormald (2001) contend the physical education environment and physical education teachers have influence on exercise and exercise avoidance in high school students. Fifty-two high school girls in a focus group were asked questions concerning their perceptions toward PA. Results indicated that high school girls agreed that PA was important and would like to be more active but indicated barriers toward exercises. Negative school physical education experiences produced the strongest feelings and barriers. An unwelcomed environment by the physical education teacher, dreaded physical education lessons, embarrassment, and dropping out of physical activities due to unattainable testing measures were among some of the examples high school girls shared.

Pangrazi and Corbin (2008) contend when teachers mandated fitness testing in class it has the opposite effect on promoting PA. They go on to assert that students do not thoroughly understand reasons for fitness testing thus perceive to be incompetent fitness. Results showed students experiences of fitness testing as negative, promoting anxiety, hopelessness, shame and even anger because the fitness standards (e.g. flexibility, weight, and height) are simply unattainable due to heredity, maturation, puberty and age. Limitations of Sleap and Wormalds and Pangrazi and Corbin's studies are the population age. The studies investigated physical education experience with students currently in

physical education. However, additional examination is needed to confirm if SSPEE influence adult attitudes toward PA.

Overall, the majority of studies with youth found little improvement of PA due to poor perception and experiences in physical education during their education (Baranowski, Cullen, Nicklas, Thompson, & Baranowski, 2002; Katz, O'Connell, Njike, Yeh, & Nawaz, 2008; Stice, Shaw, & Marti, 2006). Understanding current emotions and experiences among students in physical education provides great potential for understanding why children and youth do not participate in physical education or PA. Consequently studies conducted were limited to children and high school students currently in physical education programs. Examining physical education experiences to predict adult attitudes toward PA is a logical direction toward better understanding PA motivation and to decrease rates of obesity and overweight adolescence and adults.

Adult Physical Activity Barriers

Health behavior is defined as any activity that is undertaken by people to enhance or maintain their health (Lyons & Chamberlain, 2006). There are two distinctions between health behaviors; positive health behavior, and negative health behavior. Positive health behaviors are beneficial for a person's health whereas negative health behaviors can be detrimental. Positive health behaviors consist of exercise, eating healthy or decreased stress. In contrast, negative health behaviors include excess smoking, drinking or physical inactivity.

Exercise adherence (a devotion to an exercise regimen) has received extensive attention due to increased obesity and the lack of health enhancing PA by adults (Buckworth and Dishman, 2002). Commonly there are two types of exercise; fitness-

based (exercise are planned, structured, and repetitive bodily movement done to improve or maintain one of more components of physical fitness) and health enhancing (activity includes engagement of discretionary, enjoyable non-work activities). Both types of exercise are considered health enhancing PA and encouraged to become part of an exercise regimen (Darst & Pangrazi, 2006; Siedentop, 2007).

Adult health promotion includes both exercise adherence and positive health behaviors yet, adults are still reluctant to participate in PA (Stice, Shaw, & Marti, 2006). For example, adults, 61% of adults 18 years and older do not participate in PA three or more days a week (CDC, 2009) while Brownson, Boehmer and Luke (2005), reported a large decline of PA and suggest this is a long-term trend toward physical inactivity in the future.

Researchers do not agree on the reason for the lack of PA. Tammelin (2005) argues social class and sports participation has influence on PA participation. Kelly (2006) asserts that technology is a contributing factor to not participating in PA. Others suggest parental influence is a factor. In the United States the use of technology has become a modern staple, making life easier and more convenient. These conveniences have resulted in less activity, leading to weight gain, illness, and societal problems. Parental influence is another consideration for decreased PA (Lau, Lee, & Randell, 2007). Jago, Fox, Page, Brockman, and Thompson (2010) studied the effects of family influence on youth. They reported parents who are inactive had an association to their children's activity levels. Girls who have parents that were sedentary were more likely to be sedentary. In addition, higher parental viewing of television had an association to both boys' and girls' television viewing. Jago and colleagues call for creative approaches to

address the burden of physical inactivity as well as additional studies which expand behavioral factors that cause adult physical inactivity.

According to Buckworth and Dishman's (2007) study, the reasons why adults do not participate in PA are due to lack of time, major life events, and location or environment to exercise. This is in contrast to Rodgers, Hall, Wilson, and Berry (2009) study comparing exercisers and non-exercisers. Results concluded adults are unlikely to change their unhealthy habits even though they have been well-informed about the health risks and dangers of obesity. Lifestyle such as children under the age of 16 in the home, occupation, and employment status did not differ among groups. Even non-exercisers in the study agreed that PA was importance and should be done. Overall, health professionals continue to seek reasons why people choose unhealthy behaviors over healthy ones. Better understanding of health behaviors would assist in enhancing ways to promote PA in health and prevent avoidable diseases and chronic illnesses (Taylor, 1999).

Adult Attitudes toward Physical Activity

Adult attitudes toward PA have recently received more attention by researchers due to the association of attitude on motivation and behavior patterns (Desha, Ziviani, Nicholson, Martin & Darnell, 2007; Franklin, Denyer, Steinbeck, Caterson & Hill, 2006; Sykes & McPhail, 2008). Exploratory studies tracking PA from childhood to adulthood have brought forth indications that attitudes toward physical activity are developed through a lifespan.

Malina (1996) attempted to explain attitudes and PA by tracking PA from childhood to adulthood. Results from the investigation reported there was only mild

correlation between the reasons why PA decreases. In contrast, Engstrom (2008) and Telama's (2009) studies of tracking childhood to adulthood PA levels demonstrated there was statistical significance. Participants in the study made mention of physical education experiences having an association on adult PA. Engstrom's findings indicated physical education grades in high school had an influence in PA levels in adults. There is disagreement among researchers regarding tracking PA from childhood to adulthood and the influence of high school physical education. Nonetheless, in all the studies SSPEE were not the primary research thus further research is needed to determine if and to what degree SSPEE negatively influence attitudes toward PA among adults (Engstrom, 2008; Makinen, Borodulin, Tammelin, Rahnkonen, Laatikainen, & Prattala, 2010; Mears, 2007).

Mears (2008) argues there is a relationship between secondary school physical education as an academic progression and lifetime PA goals and life patterns. The study examined young college undergraduates and the amount of physical education requirements in school. Those who graduated from states that had more requirements in secondary school physical education spent more time performing PA outside of school as opposed to undergraduates who had lower requirements. Three PA categories were considered in the study; (a) cardio respiratory, (b) muscular strength and endurance, and (c) team/individual activities. Results indicate undergraduates who had more physical education requirements in high school reported greater levels of activity in all three areas. However, limitations in this study indicate a need for additional investigation. Due to the short time span between high school graduation and first year college students there is a need to increase the population size and age. Mears also stated there is a need to validate

the effects of SSPEE on adult PA later in life. In addition, the study did not investigate the emotional nature, nor attitudes toward PA. One must consider if negative SSPEE, attitudes, or emotions would impact the adherence to PA. To date, no study has been conducted to determine attitudes and emotions in secondary school physical education in relation to attitudes toward PA among adults.

Overall, there are adult barriers to physical activity. There is increased interest in adult attitudes toward PA mainly due to the substantial increase of obesity and sedentary lifestyles. Recommendation for more advanced research has been encouraged to identify factors that increase or decrease purposeful exercise behaviors in adults. Physical activity barriers such as technology, parental influence, and social class were considered, however research contends lifestyle restrictions are excuses and not the main reason for not participating in PA. Thus, results of studies seemingly describe other influences are deterring adults from participating in PA. Understanding factors such as SSPEE can assist health professionals to better recognize early warning signs of possible exercise deterrents. Based on the research, there is reason to believe negative exercise experiences such as in secondary school physical education results in adult exercise avoidance and lack exercise adherence, however further research is needed.

Overview of Motivation Factors and Physical Activity

Motivation is defined as a psychological construct that energizes, directs, and regulates achievement behavior (Roberts, Treasure, & Conroy, 2007). Roberts, Treasure, & Conroy (2007) established a continuum of motivation behaviors ranging from passive to driven human behaviors. Passive behaviors include lack of motivation as opposed to driven behaviors such as being more self-determined toward an activity. Expounding on

the continuum, Eckland and Cresswell (2007) established a continuum in sport activities that ranged from amotivation (the absence of motivation) to intrinsic regulation which is most self-determined. The state of amotivation is passive and the least desired on the motivation continuum. People with amotivation tend to manage their motives around avoidance behaviors especially if they perceive to be incompetent in the task or perceive the task to be too difficult.

Amotivation. Amotivation is the absence of motivation and a state in which an individual does not perceive a relationship between the behavior and the behavior outcome. Amotivation can occur when there are limits on personal decision making, no challenge or stimulus, situations are deemed unattainable, too difficult, impersonal or when one believes to be incompetent. (Deci, 1980; Eklund & Cresswell, 2007) Studies have shown when high school students in physical education felt incompetent, demeaned, or had lack of personal meaning in a task, they were less likely to be motivated to learn or participate in the skills being taught. (Engstrom, 2008; Ntoumanis, Pensgaard, Martin, & Pipe, 2004; Trout & Graber, 2009).

Marcoulides, Eskeles, Gottfried, Gottfried, and Oliver (2008) examined the longitudinal relationship of academic motivation and age with children ages 9 to 17. Results indicated that when comparing motivationally gifted students with at-risk students, students who were at-risk of being unsuccessful academically were more likely to experience unfavorable educational outcomes over time. At-risk students continued to have poor academic experiences and when given a choice, would be more likely not to partake in related academic activities. Marcoulides and colleagues state there is an urgent need to revolutionize the low-motivation in at-risk groups in order to optimize their

learning experiences. Though this was a longitudinal study with compelling results, it was limited to ages 9-17 and conducted in academic areas other than physical education.

Avoidance behaviors from physical education experiences might have long-term effects on the person's attitude in relation to PA. Carlson (1995) conducted interviews and surveys with physical education students and teacher concerning the alienation of students in physical education classes. Results indicated that alienated students showed significant signs of amotivation characteristics. Characteristics pointed toward lack of personal meaning, lack of control, and continual isolation from the physical education teacher. Negative feelings occurred due to the lack of student opportunities for choice or personal value. The study revealed those students who were not motivated to participate in physical activity used strategies to avoid participation such as hiding, being a spectator, faking illness, or skipping class. Carlson proposed an intrinsic motivation model for alienated students and suggests improved understanding of physical education experiences for alienated youth can be a useful to seek strategy to seek ways to include all types of students and promote long-term healthy lifestyles.

More recently, Shen, Wingert, Li, Sun, and Rukavina (2010) also found avoidance behaviors in physical education. They propose there are four physical education amotivation categories that affect intrinsic motivation. Categories include; (a) ability beliefs, (b) effort beliefs, (c) value placed on task, and (d) characteristics of the tasks in physical education. Based on previous research, the phenomenon of negative physical education experiences that transpires in secondary school physical education could predict adult negative attitudes toward PA. Until now, no studies have been conducted to determine this plausible cause.

Self-Determination. Self-determination (SD) is a quality that involves choice. It is an opportunity to choose and have choices, rather than reinforcement, drives, or other forms of forces or pressures shaping an action. When a person acts out on choice rather than obligation or force, this indicates the person is aware of making a conscious decision toward ones' need (Deci & Ryan, 2000). Until their need is satisfied people will be motivated or self-determined to participate in activities by their own choosing and without prodding (Tenenbaum, & Eklund, 2007). Therefore, SD is one of the few theories that can help explain why people do what they do (Bryan & Solmon, 2007; Deci, 1995). SD can lead people to engage in interesting behaviors based on feelings of competence (Deci, 1975).

Self-determination helps explain a person's motives for engaging in specific types of tasks (Brunet & Sabiston, 2009; Bryan & Solmon, 2007; Deci & Flaste, 1995; Silva, et al., 2010). Ward, Wilkinson, and Prusak (2008) conducted a study with 7th and 8th grade girls in physical education regarding SD motivation and curriculum choice. Using the Situational Motivational Scale (SIMS), results indicated students that had a choice in the activities taught selected activities that they felt more competent in doing resulting in increased IM behaviors. Therefore, students that acted out by choice reinforced positive behaviors and motivational drive.

In contrast, SD can also involve electing to give up control of an outcome. When SD is influenced by a negative environmental force it can violate a positive experience. This violation can influence a person's experience and cause change in motivation and the person's perception of competence (Deci and Ryan, 2000). Therefore, SD depends on one's environment and feelings of competence in dealing with a task. With this in mind,

there is much consideration of how feelings and emotions affect SD in physical education and PA (Cox, Duncheon, & McDavid, 2009; Murcia, Coll, & Perez, 2009; Yli-Piilpari, Watt, Jaakkola, Liukkeonen, & Nurmi, 2009).

Turner and Waugh (2007) investigated the learning process of shame reactions in students in classrooms. Through student interviews, the researchers determined a theme of negative intrinsic motivation such as “no desire to attend class,” and “feeling shame after class.” Turner and Waugh propose student learning experiences with shame initiate change in their values, goals and success toward that content area. Failures or unexpected negative events might invoke individuals to reorganize and change life paths toward more self-determined actions such as exercise avoidance and physical inactivity. Turner and Waugh conclude educators and education environment can play a key role in supporting autonomy and encourage positive behaviors. They recommend more studies be conducted to determine if, over time, emotions in academia can change life patterns and goals among adults.

Intrinsic Motivation. Intrinsic motivation (IM) is defined as behaviors and activities in which a person elects to participate by choice, desire, enjoyment, or to feel competent and self-determining (Deci, 1975). Intrinsic motivation is considered true motivation and is desirable. When a person acts out on choice rather than obligation or force, this indicates the person is aware of making a conscious decision toward ones’ need (Deci & Ryan, 2000). For example, a person with IM, in spite of exhibiting no apparent external reward, still elects to conduct an activity or behavior.

Vallerand and colleagues (1993) hypothesizes there are three types of IM: (a) IM to know, (b) IM to accomplish things and (c) IM to experience stimulation. Intrinsic

motivation to “know” pertains to engaging in activity for the pleasure and satisfaction that one experiences while learning, exploring or trying something new. The second type of IM is to “accomplish things.” This IM refers to engaging in activity for the pleasure and satisfaction that is experienced while attempting to accomplish, create something, or to surpass one self. The final type of IM is “experience for stimulation” which can involve emotional, physical and mental stimulation. Tenenbaum, & Eklund, (2007) suggest positive types of IM results in people engaging in activities out of their own choosing are known to be more intrinsically motivated and self-determined.

Piaget (1952) supports the notion that youth are intrinsically motivated by situations they might find challenging but attainable. In contrast, if a situation is overly challenging or unattainable, IM decreases and the behavior will be avoided since the youngster finds it too difficult to assimilate or learn. If the situation is not at all challenging it might be avoided due to lack of interest. One must consider if IM developed in SSPEE has a relationship to attitudes toward PA as adults. Physical education studies conducted with adolescence have suggested IM in physical education may give insight toward adult PA behaviors, however studies must be conducted to determine the influence physical education experiences has on adult attitudes toward PA (Lodewyk, Gammage, & Sullivan, 2009; Murcia, Coll, & Perez, 2009; Yli-Piipari, Watt, Jaakkola, Liukkonen, & Nurmi, 2009).

Intrinsic Motivation is ideal for participation in independent behaviors such as lifelong PA. Motivational theories offer an explanation for the relationship between secondary school physical education and attitudes toward PA. The more self-determined a person is on the continuum the more likely they are to participate or adhere to an

exercise/sports program. There is reason to consider that secondary school physical education teacher influence has long term effects on adult behaviors however to date not research has been conducted. Therefore, motivation is a useful basis for this study regarding physical education experiences and attitudes toward PA. Figure 4, provides a visual representation of the studies hypotheses of IM's relationship between SSPEE and adult attitudes toward PA.

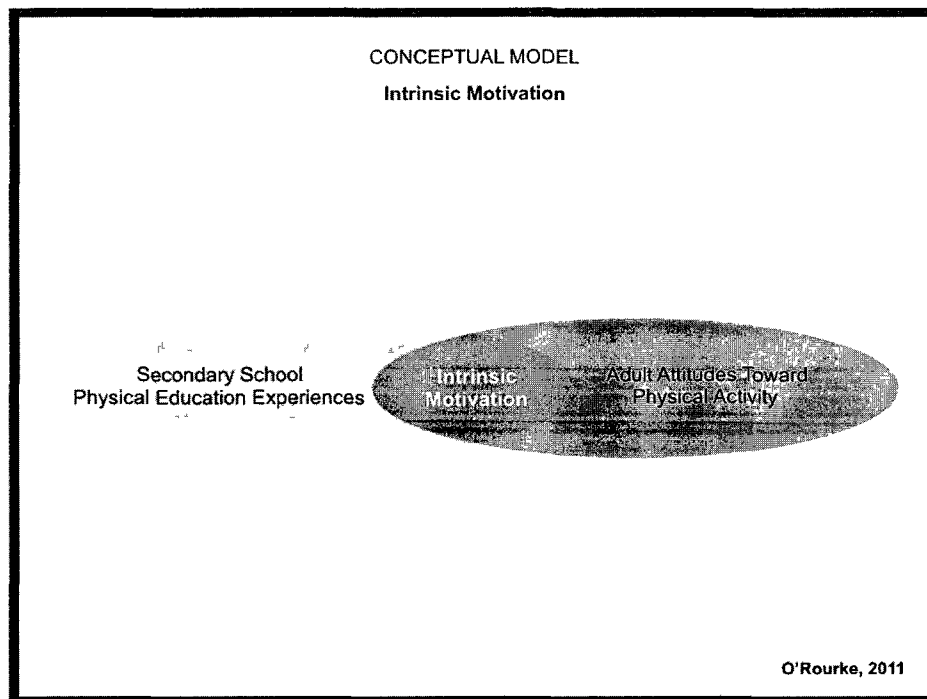


Figure 4. Intrinsic Motivation Conceptual Model

Moreno, Gonzalez-Cutre, Martinez-Albo, & Cervello (2010) conducted an experimental study using physical education teachers as a factor influencing 363 students' IM toward a physical education task. The results revealed that students in the experimental group who received feedback and motivation by the teacher had higher IM

over the control group who were just told to do the task. The study concluded physical education teachers have the ability to instill and improve IM among their students.

Gao, Lee, Solmon and Zhang (2009) studied middle school students motivation over one year in order to predict future participation physical education in high school. Their findings indicated an overall decrease in motivation over one school year yet motivation increased with increased PC and value of the tasks. Gao and colleagues provide further evidence regarding the relationship of motivation and future PA, however a limitation in this study was that the short term prediction from middle to high school and still does not provide evidence in regards to adolescent experiences influencing adult behaviors. Shafizadeh (2007) studied 163 undergraduate university physical education students' relationship between motivational climate, perceived ability and intrinsic motivation. Results from the investigation indicated a positive relationship among all three variables stating enjoyment and effort is positively related to intrinsic motivation. One limitation in this study was the participant population was limited to university students. It is important to consider all adult ages and the effect IM has on PA participation.

Rodgers, Hall, Wilson and Berry (2009), compared exercisers, exercise intenders and non-exercisers (no intention to exercise), regarding their beliefs concerning exercise. There were no differences in groups in regards to age, work status, and child-care responsibilities. Results indicate all groups agreed to the benefits of exercise and acknowledged a positive exerciser stereotype that included being energetic, happy, and healthy. The study demonstrated a distinct grouping of the motivation continuum from amotivation (non exercisers) to self-determined (exercisers). All the different group

levels of the motivation continuum agreed that exercise is beneficial. However people on the lower side of the continuum, non-exercisers, still chose not to exercise or be physically active. Rodgers, Hall, Wilson and Berry propose that non-exercisers had some negative personal experiences to cause them not to desire participation in PA or exercise. Further study is needed to determine if secondary school physical education negative experiences could be the cause.

Perceived Competence. Perceived competence (PC) refers to the person's belief in his or her own power to produce a certain level of attainment (Harter, 1978). A behavior and perception of competence is developed based on the level of control the person has over the task. When a task is perceived to be attainable a person perceives to be competent and therefore motivation increases. Research indicates PC is the source that influences IM and self-determining behaviors.

Studies have reported that learners with low PC ability were found to have reduced learning effort. Learners with high PC had less anxiety and had better ability to cope with the physical demands (Jagacinski & Nicholls, 1990; Lee, Carter, & Xiang, 1995; Walling & Martinek, 1995). Deci and Ryan (2000) contend climates where perception of autonomy and competence is supported leads to higher levels of PC. For instance, an influential factor that predicts youth participation in PA is PC in physical education (Gonzalez-Cutre, Sicilia, Moreno, Fernandez-Balboa, 2009; Sollerhed, Apitzsch, Rastam, & Ejlertsson, 2008; Warburton & Spray, 2008). Mourtidis, Vansteenkiste, Lens, and Auweele (2009) assessed 319 elementary students and their emotions, goals and PC in physical education. Results showed evidence that children with positive emotions in physical education were closely linked to a high level of PC

(e.g. hopeful, pride and enjoyment) while negative emotions in physical education (e.g. shame, boredom and anger) were related to low PC.

Zhang, Solmon, Kosma, Carson and Gu (2011) measured 286 middle school physical education students and their motivation factors. The study used “need support” (autonomy, competence, and relatedness support) from physical education teachers and PA through intrinsic motivation. Teachers provided guidance and encouraged autonomy to those students in the experimental group while the control group was only given the task. Findings indicated students in the experimental group showed increased levels of PC over the control group. Zhang and colleagues assert PC in physical education can predict students’ PA participation. They recommend physical educators promote challenging, but realistic tasks for students in order to encourage autonomy and competence in PA.

Sollerhed, Apitzsch, Rastam, and Ejlerstson (2008) examined PC and self-reported PA among 206 children ages 8-12. Results revealed that PC was associated with children’s perceived physical performance. Less active students were well aware of their low physical competence and body function which affected their performance levels. The researchers assert low perceived physical competence in physical education and activity levels could be used to identify potential students who are likely to remain inactive and prone to be unhealthy. Gao, Lodewyk, and Zhang (2009) study of PC and middle school physical education students had similar results. The results of both studies support the contention that PC in physical education may be a deciding factor affecting attitudes toward PA. However the causality of low PC in PA requires further research.

Social environmental variables such as enjoyment and self-regulation that supports autonomy builds motivation and PC. Garn, Ware, and Solmon's (2011) study of high school physical education students and motivation reported students' PC had a significant role in PA during class. Students who did not perceive to be as competent as others in the physical education class were less likely to participate with much effort thus demonstrating performance avoidance. Garn and colleagues recommend physical educators create environments that are less socially motivated and increase opportunities that encourage PC.

Researchers who have examined PC and PA, assert there is a relationship between PC and PA (Gonzalez-Cutre, Sicilia, Moreno, Fernandez-Balboa, 2009; Warburton & Spray, 2008). To date, there is little research targeting PC's relationship to both SSPEE and AATPA, thus, additional research is needed to improve understanding. Figure 5, illustrates the conceptual model for this study hypothesizing PC explains the relationship between SSPEE and attitudes toward PA as adults.

Overall, motivation theory offers a compelling argument to conduct research in respect to high school physical education experiences and adult attitudes toward PA. Motivation theory has been previously used to measured experiences and attitudes toward physical education and PA with adolescence; however it has not been studied in large populations with adults (Tenenbaum, & Eklund, 2007; Ward, Wilkinson, Graser, & Prusak, 2008). Given that motivation has been recognized as a factor in both SSPEE and adults attitudes toward PA, it is reasonable to propose that a relationship might exist between the two, thus, further investigation is needed.

Summary

The primary focus of this review of literature was to accentuate how SSPEE can impact PA behavior and motivation of adults. Adults in the United States are at risk of developing hypokinetic diseases mainly due to physical inactivity and obesity. Certain intervention methods have been used to avert obesity and physical inactivity such as secondary health promotion intervention methods. The review asserts that primary health promotion intervention methods throughout the academic process of secondary school physical education are more forthcoming for positive PA experiences and lifelong PA. However, further examination is needed to determine if SSPEE predicts attitudes toward PA among adults. Figure 5 displays the theoretical basis for this study providing a visual representation to explain the relationship between SSPEE predicts attitudes toward PA among adults.

Based on the review of literature this study will systematically and statistically meet the following objectives: (a) to identify the extent to which experiences in secondary school physical education classes influence current attitudes toward PA among adults, (b) to examine the extent to which PC predicts the relationship of secondary school physical education and current adult attitudes toward PA, and (c) to investigate the influence of IM on secondary school physical education and current adult attitudes toward PA.

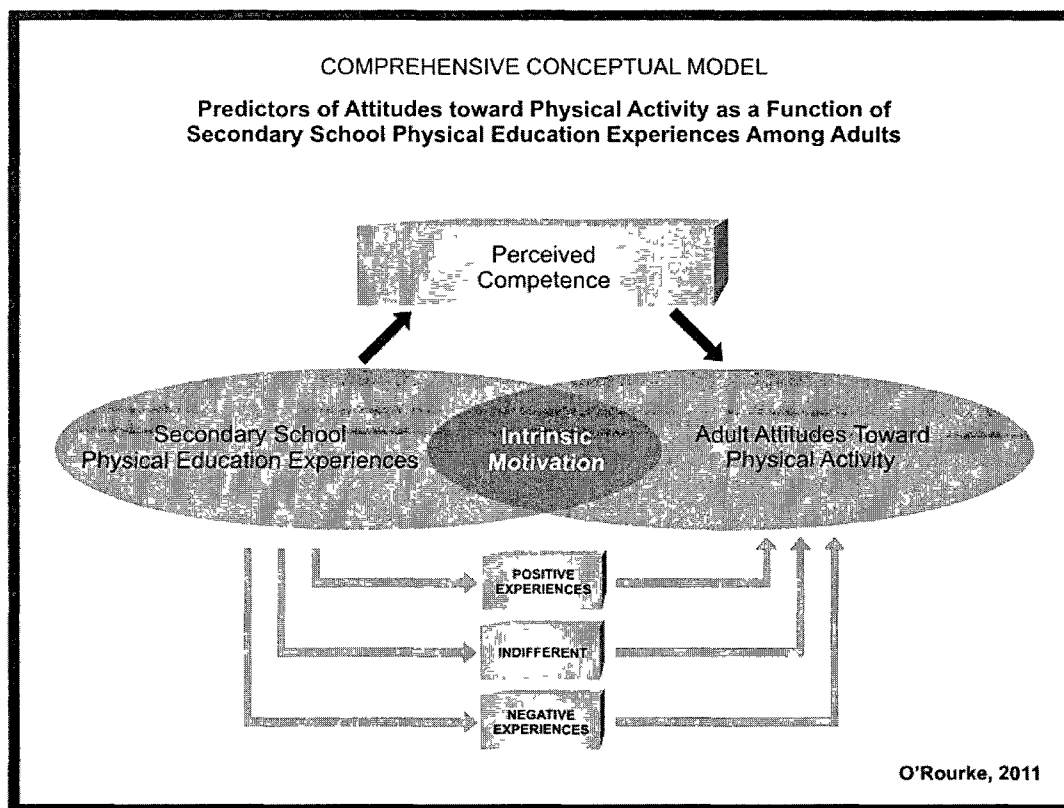


Figure 5. Comprehensive Conceptual Model (*revisited*).

Chapter III

Methods

Participants

Data used in this study ($n = 700$) were collected from 62% ($n = 433$) females and 38% ($n = 265$) males. The adults aged 18 to 77 ($M = 41.5$, $SD = 11.7$) participated in 6 months to six years of physical education classes during secondary school ranging from 7th to 12th grade with 43% ($n = 302$) reporting participation in all six years of secondary school physical education classes. The majority of participants resided in Tennessee ($n = 188$) during their youth. Adults who participated in athletics during youth were 65.3% ($n = 457$), while 34.7% ($n = 243$) did not participate in athletics.

Exclusion criteria consisted of: (1) younger than 18 years, (2) no participation in physical education during 7th through 12th grade or missing a response to this item, and (3) persons missing more than 10% of survey responses (i.e. missing responses on more than 5 close-ended survey items). Based on these criteria, 700 of the 777 participants were retained for the analysis. There were only 29 respondents solely excluded on the basis of missing more than 10% of survey responses.

With the exception of university students who were recruited through in person presentations, participants were recruited through e-mail databases from locations that included: researcher's university faculty databases, businesses, centers for the treatment of obesity, Tennessee Obesity Task Force, church affiliations and snowball sampling as well as social media sites such as, but not limited to, Facebook, business websites, My Space, blogs, Twitter, etc. Participants were informed that participation was voluntary, and that they would not experience any negative consequences if they chose not to

complete the inventory. Written informed consent was not required due to implied consent. Implied consent was given when participants elected to proceed to the survey after reading the pre-notice letter and the cover letter of the online survey (See Appendix A).

The age range was categorized into three categories; (a) 18-35, (b) 36-55, and (c) 56 and older. Erickson's Stages of Developmental Ranges indicate young adulthood age ranges from 18-35 and middle adulthood 35-55 (Berger, 2008). Due to the significant drop in physical activity that follows high school graduation (Malina, 2001), higher education institutions were selected for this study due to the large population of young adults and recent high school graduates. Adults ages 36 years and older were included due to the limited amount of studies that have been conducted to examine large populations of adults and their relationship between physical education experiences and attitudes toward physical activity (Engstrom, 2008). Substantial attempts were made to include working class adults from a variety of occupational backgrounds from businesses, churches and snowball sampling. Also included in the sample were adults that have participated in obesity treatment (i.e. bariatric surgery), from the education field, or that have obesity prevention work-related experience. Retrospective recall analyses indicate that context-dependent recall ability is more accurate when context cues are similar to the recall phase (Godden & Baddeley, 1975; Grant, 1998). Thus, participants involved in the education field, obesity treatment and obesity prevention are more likely to recall educational and physical activity related experiences.

Study Design

The research study is a cross-sectional survey design describing the relationship between secondary school physical education experiences (SSPEE) and attitudes toward physical activity among adults. Cross-sectional designs (data collected at one point in time from a random sample of a general population) intention is to compare the cross-sectional data from the subsamples in order to determine trends across the subsamples. (Wiersma, 2000).

Survey Development

A 55 item online survey was created and disseminated to assess the relationship between adult attitudes toward lifetime physical activity and secondary school physical education experiences. Intrinsic motivation items were included as a subscale of adult attitudes toward physical activity (AATPA) and youth attitudes toward physical education (ATPE). The survey also sought to determine what degree perceived competence predicts the relationship between secondary school physical education experiences and AATPA.

Retrospective Recall. In order to promote retrospective recall of secondary school physical education experiences, the survey included pre-selected choices of common physical education behaviors (e.g. athletic participation, years of physical education classes, body type during secondary school) based on studies that have identified common physical education experiences (Pope & O’Sullivan, 2003; Shen, Wingert, Li, Sun, & Rukavina, 2010; Shehu, 2009; Sidwell & Walls, 2009; Trout & Graber, 2009; Wrench & Garrett, 2008). In addition, responses to target questions moved in the direction to promote recall. As an example, context questions regarding current

adult attitudes of physical activity was used to promote retrospective recall for physical education experiences. This consistency effect and use of question building limits confusion and assists in retrospective recall (Tourangeau, Rips, & Rasinski, 2000).

Focus Group. Two pre-study focus groups ($N_1 = 10$ and $N_2 = 14$) were conducted to pilot retrospective recall methods for physical education experiences and to select the most common physical education behaviors for the pre-selected choices of the questionnaire. At the beginning of each focus group a written questionnaire was given to each participant to assist in retrospective recall of secondary school physical education experiences. Participants were also asked to write personal secondary school physical education experiences. The focus group discussion was based on common physical education experiences and behaviors from previous qualitative literature regarding physical education experiences.

Results revealed that adults who were athletes had more positive memory recollection which included enjoyment and pride. Moreover in both focus groups adults recalled secondary school physical education class experiences to be more negative either to themselves or to classmates. The first focus group ($N_1 = 10$) consists of individuals who did not participate in athletics. They reported to have had more negative experiences in physical education that included humiliation, hopelessness, anxiety and boredom than the second focus group. The second focus group ($N_2 = 14$) consisted of adults who participated in athletics during secondary school. Both groups equally recalled and shared concern about the embarrassment, anxiety, and shame that occurred for the overweight and unskilled students in their physical education classes. Overall, common negative secondary school physical experiences included (a) negative experiences linked to

inappropriate teaching, (b) physical education perceived to be of little benefit, (c) running perceived to be highly uncomfortable and emotionally upsetting, (d) fitness testing perceived to be as an embarrassing, (e) the desire not to have been observed by peers and (f) have low perceived competence.

Based on prior studies and the focus groups' secondary school physical education experiences, attitudes and behaviors that were typically experienced were selected to be used in the study's survey.

Measures

Instrumentation used in this study consisted of valid and reliable questionnaires previously published in educational, physical education pedagogy, and psychological literature. Measurements were selected based on scales that comprehensively measured the relationship between secondary school physical education experiences and AATPA. Two scales and a demographic section were combined into one survey. The two scales included the Academic Emotions Questionnaire (AEQ; Pekrun, Goetz, Titz & Perry, 2002) and Situational Motivational Scale (SIMS; Guay, Vallerand, & Blanchard, 2000). Scales wording was modified slightly in order to relate physical education and physical activity context and meaning.

Adult attitudes towards physical activity (AATPA). AATPA were assessed by the Situational Motivation Scale (Adult SIMS; Guay, Vallerand, & Blanchard, 2000). Eight items measured current attitudes towards physical activity in adulthood ($\alpha = 0.861$) on a 7-point Likert scale from 1 (corresponds not at all) to 7 (corresponds exactly). The Adult SIMS scale was divided into three adult attitudinal subscales: intrinsic motivation (IM) (2 items; $\alpha = 0.680$), identified regulation (IR) (2 items; $\alpha = 0.525$), and amotivation

(AM) (4 items; $\alpha = 0.840$). Reported Cronbach alpha values were computed based on the current study ($n = 700$). Since internal consistency was adequate, summary scores were computed for the overall scale and the three subscales. Higher scores indicate more positive attitude toward physical activity (PA) in adulthood. Specifically, the IM items included “PA is fun” and “I feel good when I do PA.” The IR items were “PA is important to me” and “PA is good for me.” Four AM items included “I do not see what PA brings me” and “I am not sure PA is a good thing to pursue” (See Appendix B).

Some items within this scale addressed perceived competence (PC) – either positive or negative. Two items measured positive PC ($\alpha = 0.707$) (e.g. “I feel good when I do PA.”), while two items measured negative PC ($\alpha = 0.769$) (e.g. “There may be good reasons to so PA but I personally do not see any”). All four PC items were also combined and formed a scale ($\alpha = 0.788$).

Previous reliability and validity analysis of the SIMS and subscales report Cronbach’s α value for IM is .95 (Guay, Vallerand, & Blanchard, 2000). Nunnally (1978) suggested that self-report scales with internal consistencies in the .70-.80 range are acceptable for research purposes. With the exception of the IM and IR subscales, SIMS meets this criterion, slightly lower than the Nunnally criterion. The construct validity of the scale was assessed through correlations between the SIMS subscale and motivational determinants perceived competence ($r = 0.54$) and consequences such as behavioral intentions ($r = 0.37$). IM and IR have successfully been predicted to correlate positively with determinants and consequences of motivation. External regulation and amotivation have correlated negatively with determinants and consequences.

SIMS has been widely used in other studies and repeatedly supported for reliability and validity and other strong psychometric properties (Lavigne et al, 2009; Standage, Treasure, Duda, & Prusak, 2003). The scale provides accurate factorial structure and internal consistency that reinforces the theory of assessing motivation. Cronbach's α for the situational motivation subscale is 0.85 (Guay, Vallerand, & Blanchard, 2000). Research using SIMS has also been established regarding examination of physical activity motivation. Standage and Treasure (2002) contend there is adequate reliability and construct validity for SIMS measuring physical activity motivation.

Current adulthood physical activity. Adults' current PA information was collected. Information obtained included; (a) adults' current satisfaction level toward PA, (b) days per week of PA participation, (c) medical diagnosis impeding exercise (yes, no), and (d) exercise intensity (measured as easy, more easy than moderate, moderate, and both moderate and vigorous and vigorous) (See Appendix B).

Youth attitudes toward physical education (ATPE). ATPE were measured by a total of 8 items modified from the SIMS to assess attitudes towards physical education (PE) during grades 7th-12th (instead of attitudes towards physical activity in adulthood) (Youth SIMS, $\alpha = 0.951$). Individual items were measured on a 7-point Likert scale from 1 (corresponds not at all) to 7 (corresponds exactly). The youth SIMS scale was divided into three subscales: (a) intrinsic motivation (IM) (2 items; $\alpha = 0.945$), (b) identified regulation (IR) (2 items; $\alpha = 0.820$), (c) amotivation (AM) (4 items; $\alpha = 0.927$). Summary scores for the overall scale and subscales were computed since internal consistency was good. Higher scores indicate a more positive attitude toward physical education during 7th-12th grade. The IM items included "PE was fun" and "I remember I felt good when

was in PE.” The IR items were “PE was important to me” and “PE was good for me.” Examples of the AM items consisted of “I don’t see what PE brought me.” and “I do not think PE was a good thing” (See Appendix B).

Some items within this scale addressed perceived competence – either positive or negative. Two items measured positive perceived competence ($\alpha = 0.927$), while two items measured negative perceived competence ($\alpha = 0.874$). An example of a positive PC item was “PE was important to me” as opposed to an example of a negative PC item such as “PE class was not worth taking.” All four perceived competence items were also combined and formed a scale ($\alpha = 0.904$).

Previous secondary school physical education experience (SSPEE) was measured by the Academic Emotions Questionnaire (AEQ; Pekrun, Goetz, Titz, & Perry, 2002). The AEQ is a self-report instrument based on both quantitative and qualitative research that examines learning related emotions experienced in academic situations (enjoyment, hope, pride, anger, anxiety, shame, hopelessness, and boredom). Sixteen items compiled the full AEQ scale ($\alpha = 0.960$), with the SSPEE summary scores ranging from 16-80, with 80 being the most favorable emotions toward physical education (PE). There were three subscales for class-related emotions before, during, and after physical education class. All individual items were measured on a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). Five items measured the “before PE class” subscale ($\alpha = 0.905$). Examples include “I used to get excited about going to PE class.” and “I used to be so nervous I would rather have skipped PE.” The 5 items were summed to create a “before PE class” summary score, ranging from 5-25 with 25 being the most favorable emotions. Eight items assessed “during PE class” emotions ($\alpha = 0.910$).

Example items include: “Because I enjoyed PE, I recall wanting to participate.” and “All the useless things I had to do in PE made me irritated.” These 8 items were summed to create the “during PE” class summary score, ranging from 8-40 with 40 being the best experience. Lastly, three items assessed feelings after PE class ($\alpha = 0.886$). Examples included “I can be proud of what I accomplished in PE.” and “I was discouraged about the fact that I never learned anything.” The 3 items were summed to create the “after PE class” summary score, which ranged from 3-15 with 15 being indicative of the best experience (See Appendix B).

Some items within this scale addressed PC – either positive or negative. Two items measured positive perceived competence within the during PE class subscale ($\alpha = 1.000$) (e.g. “I recall being confident because I could the skills and activities.”), and two items measured positive perceived competence within the after PE class subscale ($\alpha = 0.939$) (e.g. “Reflecting on my accomplishments in PE makes me happy.”). Two items measured negative perceived competence within the before PE class subscale ($\alpha = 0.765$) (e.g. “I recall it being pointless to go to PE since I could not do the skill and activities.”), and two items assessed negative perceived competence within the during PE class subscale ($\alpha = 0.863$) (e.g. “I recall being embarrassed about not being able to do a skill or activity.”).

The AEQ scale has been shown to be an effective tool in determining academic emotions. AEQ has been used on adults and to assess middle and high school emotions experienced in mathematics, Latin instruction, and language arts, and has measured university students academic boredom and academic performance (Acee et al., 2010; Frenzel, Pekrun, & Goetz, 2007; Goetz, Frenzel, Pekrun, Hall, & Ludtke, 2007; Goetz,

Pekrun, Hall, & Haag, 2006; Pekrun, Elliot, & Maier, 2009). The AEQ reliability indices from previous studies range from adequate ($r = .75$) to very good ($r = .93$). The internal structural validity of the AEQ in terms of emotion component structures has been analyzed by means of exploratory factor analysis and confirmatory factor analysis (Pekrun, Goetz, & Perry, 2005). The AEQ has been shown to have marginal predictive validity indices for students' academic achievement ranging from $r = 0.27$ to 0.45 . It has predictability of learning-related anxiety, shame, and hopelessness, ranging from $-.24$ to $-.46$. Perry, Hladkyj, Pekrun, Clifton, and Chipperfield's (2005) three-year study of academic emotions assessed by the AEQ demonstrated a relationship to intrinsic motivation to learn, perceived competence, and investment of effort.

Previous secondary school information. Data of overall adolescent experiences were collected in order to control for confounding variables (mediator variables that could adversely affect the relation between the SSPEE and AATPE). Confounding variables included; (a) overall adolescent experiences such as parental influence, (b) athletic participation in secondary school and (c) years in physical education classes. An example items includes "While growing up did your parents or guardians who you lived with exercise regularly?" Further information was collected regarding adolescent self-perception that includes; (a) body type, (b) satisfaction of physical education experience, and (c) whether physical education prepared them for a lifetime of physical activity. An example is "How satisfied are you with your overall physical education experience?" (See Appendix B). Variables were controlled for in order to ensure no false positive (Type 1) error would be created between SSPEE and ATTPA or cause an incorrect rejection of the null hypotheses.

Demographics. Demographic characteristics were also collected on the survey and they included age, gender, level of education, annual income, height, weight, and hours worked per week. Height (in inches) and weight (in pounds) were used to determine BMI using the formula: $(\text{weight}/\text{height}^2) \times 703$ (See Appendix B).

Procedures

The study was approved by the researcher's university's Institutional Review Board (IRB) for exempt review approval (see Appendix C). Written informed consent from the participants was not required due to implied consent. Implied consent was given when participants elected to proceed to the survey after reading the pre-notice letter and the cover letter of the online survey. Following university IRB approval, university students were recruited in person through presentations and were given photocopied pre-notice letters. The pre-notice letter was on the researcher's university letterhead and included a scanned image of the researcher's personalized signature including the committee chair's signature, the researcher's contact information, their rights to volunteer, and assurance of anonymity (see Appendix D). All other participants were recruited via e-mail solicitation through business databases, the researcher, business websites, blog sites, Facebook and other social media (See Appendix E). To ensure a sufficient amount of participants for the study, additional recruitment efforts included a snowball sampling ($n = 30$).

The survey was designed and posted online through the online survey website named *SurveyMonkey.com*. After the pre-notice letter was sent to participants the respondents received an e-mail introduction and website link to the SurveyMonkey website survey. When participants completed the online survey they were asked to

forward the survey e-mail link to friends and co-workers. Data collection was terminated nineteen days (December 23 – January 10) after the initial e-mail.

Power Analysis. A power analysis was conducted to determine the minimum sample size required to accept the statistical outcome and to establish sufficient power. G*Power Version 3.1.2 software was utilized to perform the power analysis for the multiple linear regression analyses (Faul, Erdfelder, Buchner, & Lang, 2009). The power analysis was set to achieve a 95% power level, while the alpha level was set at 0.05 to control for Type I error. Moreover, a small Cohen's effect size f^2 of 0.05 was selected to statistically detect small yet important associations [effect size f^2 guidelines: 0.02 small, 0.15 medium, 0.35 large Cohen, 1988)]. Hence, with a maximum of 18 dependent variables in the multiple linear regression analysis, a sample size of 607 was calculated. Seven hundred participants were included in the analysis; for this reason power was sufficient to be able to detect significant associations if they existed.

Data Entry. SurveyMonkey.com automatically saved user responses. The researcher compiled survey responses and downloaded data into Microsoft Excel. Data was cleaned and made ready for analyzing. Reverse coding was used based on the direction of the scale (e.g. amotivation items). Missing data was controlled for by using the group's mean value.

Statistical Analyses

Microsoft Excel data was exported into PASW 17.0.2 software for statistical analysis. First, descriptive statistics of the main study data was computed. Next, the multiple linear regression analyses, reduced and full models, were calculated to investigate the predicted relationship between the two main variables in the study--

secondary school physical education experiences (IV) on attitudes toward physical activity (DV). Perceived competence and intrinsic motivation were also analyzed in two separate regression analysis checking for the influence of each on the main variables.

Below are analyses are detailed by section:

Demographic Comparison between Respondents Included and Excluded from the Final Analysis Univariate independent t-tests and chi-square tests were conducted to ascertain if select Methods demographic characteristics were statistically different between the cases retained for analysis ($n = 700$) versus those cases excluded based on the above mentioned criteria ($n = 77$) (Table 1). The characteristics assessed included: gender, age, education, income, days worked per day, and BMI.

Missing Data. In the cases retained for the final analysis ($n = 700$), 264 had missing responses for 1 to 4 closed-ended items. Out of the 264, 216 were only missing on one item. Specifically, the items that were skipped included: adult physical activity satisfaction, adult physical activity participation, intensity of adult physical activity participation, parental regular exercise, state of residence during 7th-12th grade, satisfaction with overall physical education experience, physical education prepared for a lifetime of physical activity, medical condition prevents exercise, education, height/weight (for BMI), hours worked per day, and annual income. Hours worked per day and annual income were the most frequently skipped items.

Listwise deletion (i.e., omission of cases with data missing on any item included in an analysis) is the default method to handle missing data in PASW software. In order to avoid sample size reduction, the series mean missing data technique in PASW 17.0.1

was utilized. The series mean technique generates and fills in missing values with the mean of the non-missing values for the same item.

Descriptive Information. Descriptive characteristics of the sample, predictor variables, and outcome variables were computed using mean $\pm$ *SD* for continuous (and selected ordinal variables) and *n* (%) for ordinal and nominal variables. These characteristics were displayed in Tables 2-9.

Analysis of Hypotheses. The statistical analysis for each hypothesis is described below.

Hypothesis #1 asserted that previous secondary school physical education experience (SSPEE) were significantly related to adult attitudes toward physical activity (AATPA), after controlling for covariates. The dependent variable was AATPA measured continuously using the Adult SIMS summary score. The main independent variable was previous SSPEE assessed using the total AEQ summary score that combines subscales on emotions before, during, and after PE class. Dummy variables were created for categorical covariates. The covariates measured included: gender (1 = female, 0 = male [reference]), age (18-35 [reference], 36-55, 56+), BMI, days per week exercise, diagnosed medical condition precluding participant from exercising (1 = no medical condition, 0 = medical condition [reference]), current hours worked, years in secondary school physical education (four dummy variables described below), parental influence of exercise during secondary school (1 = Parents exercised, 0 = Parents did not exercise [reference]), athletic participation in secondary school (1 = Participation in school sports, 0 = No participation [reference]), and self-reported body type in secondary school (three dummy variables described below). Four dummy variables were created from the 5

categories of years in secondary school physical education (2 years or fewer was the reference category): All years vs. 2 years or fewer, 5 years vs. 2 years or fewer, 4 years vs. 2 years or fewer, and 3 years vs. 2 years or fewer. Three dummy variables were created from the 4 categories of self-reported body type in secondary school (the combined overweight/very overweight category was the reference category): Very underweight/underweight vs. overweight/very overweight, average vs. overweight/very overweight, slightly overweight vs. overweight/very overweight.

A hierarchical multiple linear regression analysis was employed to examine the relationship between previous SSPEE and AATPA while controlling for covariates. The regression assumptions of normality of residuals, lack of multicollinearity, and homogeneity of variance were first assessed. This assumption assessment applies to hypotheses #1-3. Normality of residuals (i.e., errors of prediction are normally distributed around each predicted outcome) was assessed via histogram and normal probability plot of the standardized residuals for the outcome. The homogeneity of variance assumption indicates that the variation of residuals should be uniform across the range of predicted values. This assumption was visually assessed through a scatterplot graphing the standardized residuals (y) by the standardized predicted values (x). Violation of homogeneity of variance is traditionally detected if a funnel of data points within the scatterplot emerges. Detection of multicollinearity (i.e., the high correlation between predictor variables) was examined by using a variance inflation factor (VIF) criterion of > 3.0 and a tolerance criterion of < 0.33 . These two estimates are produced for each predictor variable.

Once assumptions were assessed, a hierarchical, blockwise multiple linear regression was computed. The theory-based hierarchical regression method was selected to ascertain what the additional variation of AATPA was explained for by the previous SSPEE variable after taking into consideration the covariates. In other words, the goal of this regression procedure was to determine if previous SSPEE was statistically related to AATPA after controlling for covariates. Stepwise regression was not selected since this analysis was not an exploratory analysis with the goal of maximizing R^2 or the amount of variability explained for by the predictors. This investigation has a well-defined theory base which supports the use of the hierarchical, blockwise method.

Specifically, the first block of predictors included all the covariates. The second block of predictors included the total SSPEE summary score evaluating emotions before, during, and after physical education classes during 7th-12th grade. Therefore, two models were produced – Model 1 with only covariates, and Model 2 with covariates plus the SSPEE variable. Both models produced an F-test value (overall test of regression coefficient significance), R^2 (measure of percent of outcome variation explained for by the block of predictors), and an adjusted R^2 (corrected R^2 to better assess model fit in the population). A significant F-change and R^2 -change indicated the additional variation explained by each block of predictors. The adjusted regression estimates in the full model were used to determine if the SSPEE variable statistically helped to explain the variation of the dependent variable while controlling for covariates. The level of significance of regression estimates was set at 0.05.

Hypotheses #2 and #3 asserted that the relationship between previous secondary school physical education experiences (SSPEE) and adult attitudes toward physical

activity (AATPA), after controlling for covariates, is mediated by perceived competence (PC) in secondary school physical education classes. Therefore, another block of predictors including PC was added to the hierarchical multiple linear regression [Table 10, Model 3]. Specifically, this hypothesis compared Model 2 and Model 3 within Table 10. Model 2 included the dependent variable of AATPA measured continuously using the Adult SIMS summary score, the main independent variable of previous SSPEE assessed using the AEQ summary score, and the covariates previously mentioned under Hypothesis #1. Model 3 included an additional block for the perceived competence (PC) summary score from the Youth SIMS (combination of PC+ Youth SIMS and PC- Youth SIMS items).

The additional model produced an F-test value (overall test of regression coefficient significance), R^2 (measure of percent of outcome variation explained for by the block of predictors), and an adjusted R^2 (corrected R^2 to better assess model fit in the population). A significant F-change and R^2 -change indicated the additional variation explained by the additional PC variable. The adjusted regression estimates in the full model were used to determine if PC variables statistically helped to explain the variation of the dependent variable in addition to the previous SSPEE items while controlling for covariates. The level of significance of regression estimates was set at 0.05.

Hypothesis #4 stated that when controlling for covariates, intrinsic motivation of adult attitudes toward physical activity (IM AATPA) is related to past emotions in regards to participants' experiences in physical education class (SSPEE) and past attitudes toward physical education (ATPE). The dependent variable in this analysis was intrinsic motivation of adult attitudes toward physical activity (IM AATPA) measured

continuously using the intrinsic motivation subscale summary score of the Adult SIMS scale, ranging from 2-14, with 14 being indicative of positive ATPE as youth. The two main independent variables included: (1) SSPEE assessed using the total AEQ summary score that combines subscales on emotions before, during, and after PE class, and (2) past youth attitudes toward physical education (ATPE) assessed via the Youth SIMS summary scale score. Covariates included in this analysis were detailed in hypothesis #1.

A hierarchical multiple linear regression analysis was employed to examine the relationship between intrinsic motivation of current attitudes toward physical activity and the independent variables of SSPEE and ATPE, while controlling for covariates. The regression assumptions of normality of residuals, lack of multicollinearity, and homogeneity of variance were first assessed. Normality of residuals (i.e., errors of prediction are normally distributed around each predicted outcome) was assessed via histogram and normal probability plot of the standardized residuals for the outcome. The homogeneity of variance assumption indicates that the variation of residuals should be uniform across the range of predicted values. This assumption was visually assessed through a scatterplot graphing the standardized residuals (y) by the standardized predicted values (x). Violation of homogeneity of variance is traditionally detected if a funnel of data points within the scatterplot emerges. Detection of multicollinearity (i.e. the high correlation between predictor variables) was examined by using a variance inflation factor (VIF) criterion of > 3.0 and a tolerance criterion of < 0.33 . These two estimates were produced for each predictor variable.

Once assumptions were assessed, a hierarchical, blockwise multiple linear regression was computed. The theory-based hierarchical regression method was selected

to ascertain what the additional variation of intrinsic motivation of AATPA was explained for by previous SSPEE and ATPE after taking into consideration the covariates. In other words, the goal of this regression procedure was to determine if previous SSPEE and ATPE were statistically related to intrinsic motivation of AATPA after controlling for covariates. Again, this investigation has a well-defined theory base which supports the use of the hierarchical, blockwise method.

Specifically, the first block of predictors included all the covariates. The second block of predictors included the total SSPEE summary score evaluating emotions before, during and after physical education classes during 7th-12th grade and the ATPE summary score assessing attitudes toward physical education classes. Therefore, two models were produced – Model 1 with only covariates, and Model 2 with covariates plus the SSPEE and ATPE variables. Both models produced an F-test value (overall test of regression coefficient significance), R^2 (measure of percent of outcome variation explained for by the block of predictors), and an adjusted R^2 (corrected R^2 to better assess model fit in the population). A significant F-change and R^2 -change indicated the additional variation explained by each block of predictors. The adjusted regression estimates in the full model were used to determine if the SSPEE and ATPE variables statistically helped to explain the variation of the dependent variable while controlling for covariates. The level of significance of regression estimates was set at 0.05.

Chapter IV

Results

Participants

Initially, a total of 777 participants responded to the study's questionnaire and 30 surveys were completed based on the snowball sampling method. However, 700 of 777 respondents were retained for the analysis based on the inclusion criteria. Table 1 lists characteristics of participants who were included versus excluded from the final analysis. Excluded participants reported a higher percentage of 4-year college degrees [$X^2(df = 7)$, $= 24.243$, $p = .001$]. No other characteristics were statistically different between respondents who were retained versus excluded from subsequent analyses. It should be noted Table 1 displays the raw data prior to group mean imputation.

Descriptive Information

Table 2 provides descriptive characteristics of the adult participants, while Table 3 illustrates the frequency of current adult physical activity. Table 4 displays frequency of adult situational motivational scale (SIMS), that is; items, subscales, and total scale summary score that measure current adult attitudes towards physical activity (AATPA). Table 5 summarizes the frequency of youth attitudes toward physical education (ATPE) and includes items, subscales, and a total scale summary score. *Perception of Self and Physical Education During 7th through 12th grades* are described in Table 6. Table 7 illustrates the Academic Emotions Questionnaire's (AEQ) in measuring secondary school emotions before, during, and after physical education class (SSPEE). Table 8 illustrates the descriptive analysis of positive perceived competence (PC) items within both adult

and youth SIMS and youth AEQ. Lastly, Table 9 summarizes the negative PC items within adult and youth SIMS and the youth AEQ.

Descriptive characteristics of survey participants. Table 2 summarizes the demographics and the characteristics of the survey participants. The average age of participants was 41.5 years, and 62.1% of participants were female. The mean number of participants possessed a 4-year college degree or higher (65.2%) and the median annual family income was \$50,000 ($M = 7.6$ hrs worked/day). Height and weight were collected for a mean BMI of 26.9 with 57.3% ($n = 401$) between the range of being overweight to morbidly obese.

Frequency of current adult physical activity. Table 3 depicts the frequency of current physical activity levels. The results indicate that 94% ($n = 658$) of participants had no medical diagnosis that impeded their ability to participate in exercise or perform health enhancing physical activity. The average participation time in weekly physical activity was 2.5 days a week, with 51.5% ($n = 360$) participating in two or less days per week. Adults who participated in physical activity for leisure or health enhancing exercise, 30.1% ($n = 211$) stated they exercised at a both moderate to vigorous level of intensity. Only 4% ($n = 28$) reported they exercised at a “vigorous” rate. Level of satisfaction with their current level of physical activity indicated 44.3% ($n = 310$) who were mostly or completely dissatisfied, while 37.3% ($n = 260$) were mostly or completely satisfied.

Table 1

Participants Included versus Excluded from the Final Analysis

Characteristics	Included Cases for Analysis (n = 700)	Excluded Cases for Analysis (n = 77)	t / χ^2	p
	$n (\%)$ or $Mean \pm SD$	$n (\%)$ or $Mean \pm SD$		
Gender			$\chi^2 = 0.321$	.571
Male	265 (38.0)	6 (31.6)		
Female	433 (62.0)	12 (68.4)		
Age, y	41.5 $\pm$ 11.7	38.4 $\pm$ 13.3	$T = 1.086$	.278
Highest Level of Education			$\chi^2 = 24.243$	.001*
Less than High School	1 (0.1)	1 (5.6)		
High School or GED	51 (7.3)	0 (0.0)		
Some College	127 (18.2)	3 (16.7)		
2-Year College Degree	65 (9.3)	0 (0.0)		
4-Year College Degree	195 (27.9)	8 (44.4)		
Master's Degree	163 (23.3)	5 (27.8)		
Doctoral Degree	83 (11.9)	1 (5.6)		
Professional Degree	14 (2.0)	0 (0.0)		
Annual Income†	199,320 $\pm$ 2,821,987 (Median = 50,000)	38,946 $\pm$ 24,029 (Median = 42,000)	$t = 0.220$	.826
Hours Worked per Day	7.6 $\pm$ 3.2	7.4 $\pm$ 3.0	$t = 0.219$	.827
Body Mass Index	26.9 $\pm$ 6.0	28.7 $\pm$ 14.1	$t = -0.521$	.610
Underweight (<18.5)	12 (1.7)	0 (0.0)		
Normal (18.50-24.99)	283 (41.3)	10 (62.5)		
Overweight (25-29.99)	238 (34.7)	2 (12.5)		
Obese Class I (30-34.99)	97 (14.1)	2 (12.5)		
Obese Class II (35-39.99)	32 (4.7)	1 (6.3)		
Morbidly Obese (40-80)	24 (3.5)	1 (6.3)		

* $p < .05$

†The nonparametric test equivalent to the independent t-test, Mann-Whitney U test, was also computed to ascertain if due to the non-normally distributed income variable differed by those who were included versus excluded in the analysis - results agree with independent t-test results (*Mann Whitney U* = 3644, $z = 1.516$, $p = .129$).

NOTE: Represents pre-missing data mean imputation. Exclusion criteria consisted of: (1) no participation in physical education during 7th through 12th grade or missing a response to this item, and (2) persons missing more than 10% of survey responses (i.e., missing responses on more than 5 close-ended survey items).

Frequency of AATPA- Adult SIMS. Table 4 displays the adult SIMS results, frequencies and summary scores of AATPA. Eight items measured the participants' current attitudes towards physical activity in adulthood ($\alpha = 0.861$). The higher the SIMS score, the more positive attitude toward PA in adulthood. Participant responses scored in the upper end of the SIMS ($M = 49.5$, $SD = 6.9$). Intrinsic motivation ($M = 11.4$, $SD = 2.4$) factors such as "I feel good when I do PA," reported 82.8% ($n = 580$) that "corresponds a lot" to "corresponds exactly." The results of IR ($M = 12.2$, $SD = 2.0$) items indicated adults associate the worth of PA to positive attitudes. For instance, 91.6% ($n = 641$) of participants responded "PA is good for me" ($M = 6.6$, $SD = 0.9$), in the "corresponds a lot" or "corresponds exactly" range while 63% ($n = 442$) responded in the same "a lot" to "exactly" range to "PA is important" ($M = 5.6$, $SD = 1.5$). Participant responded to all amotivation items ($M = 25.9$, $SD = 3.7$) in the "corresponds not at all" range at a rate of 68% or more. For example, the amotivation item "Not sure PA is a good thing to pursue" ($M = 6.6$, $SD = 1.1$), 79% ($n = 553$) of the participants responded "corresponds not all" Participants overall responded more positively toward IM and PA than negatively.

Table 2

Descriptive Characteristics of Survey Participants

Characteristics	Included Cases for Analysis (<i>n</i> = 700)
	<i>n</i> (%) or Mean $\pm$ SD
Gender	
Male	265 (37.9)
Female	435 (62.1)
Age (y)	41.5 $\pm$ 11.7
18-35	231 (33.0)
36-55	421 (60.1)
56 and older	48 (6.9)
Highest Level of Education	
Less than High School	1 (0.1)
High School or GED	51 (7.3)
Some College	127 (18.1)
2-Year College Degree (Associate's)	65 (9.3)
4-Year College Degree (BA, BS)	196 (28.0)
Master's Degree	163 (23.3)
Doctoral Degree	83 (11.9)
Professional Degree (MD, JD)	14 (2.0)
Annual Income	184,388 $\pm$ 26,773,334 (Median = 50,000)
Hours Worked per Day	7.59 $\pm$ 3.1
Body Mass Index	26.9 $\pm$ 6.0
Underweight (0-18.49)	12 (1.7)
Normal (18.50-24.99)	286 (40.9)
Overweight (25.00-29.99)	244 (34.9)
Obese (30.00-34.99)	101 (14.4)
Obese Class II (35.00-39.99)	32 (4.6)
Morbidly Obese (40.00-80.00)	24 (3.4)

Table 3

Frequency of Current Adult Physical Activity

Characteristics (<i>n</i> = 700)	<i>n</i> (%) or <i>Mean</i> ± <i>SD</i>
Medical diagnosis impeding exercise	
Yes	42 (6.0)
No	658 (94.0)
Satisfaction with Current Level of Physical Activity [†]	2.9 ± 1.2
Completely Dissatisfied	79 (11.3)
Mostly Dissatisfied	231 (33.0)
Neither Satisfied or Dissatisfied	130 (18.6)
Mostly Satisfied	207 (29.6)
Completely Satisfied	53 (7.6)
Days a Week Exercise for Fitness or Participate in Physical Activity for Fun	2.5 ± 2.0
0	133 (19.0)
1	130 (18.6)
2	97 (13.9)
3	132 (18.9)
4	73 (10.4)
5	71 (10.1)
6	41 (5.9)
7	23 (3.3)
Exercise/Physical Activity Intensity	
Do not exercise	133 (19.0)
Easy	36 (5.1)
More Easy to Moderate	114 (16.3)
Moderate	178 (25.4)
Both Moderate to Vigorous	211 (30.1)
Vigorous	28 (4.0)

[†]Mean satisfaction ranges from 1-5, with 5 being the most satisfaction

Table 4

Frequency of Adult Attitudes towards Physical Activity (AATPA) (Situational Motivation Scale – Adult SIMS)

(<i>n</i> = 700)	Mean ^{††} ± <i>SD</i>	Corresponds Not at All [<i>n</i> (%)]	Very Little	Little	Moderately	Enough	A Lot	Corresponds Exactly
Intrinsic Motivation (IM)								
PA is fun [†]	5.2 ± 1.6	18 (2.6)	35 (5.0)	45 (6.4)	118 (16.9)	122 (17.4)	194 (27.7)	168 (24.0)
Feel good when do PA [†]	6.2 ± 1.2	6 (0.9)	8 (1.1)	14 (2.0)	40 (5.7)	52 (7.4)	185 (26.4)	395 (56.4)
<i>IM Adult SIMS Summary Score (ranges from 2-14, with 14 as positive attitude)</i>								
	11.4 ± 2.4	--	--	--	--	--	--	--
Identified Regulation (IR)								
PA is important [†]	5.6 ± 1.5	10 (1.4)	20 (2.9)	41 (5.9)	85 (12.1)	102 (14.6)	189 (27.0)	253 (36.1)
PA is good for me [†]	6.6 ± 0.9	3 (0.4)	2 (0.3)	6 (0.9)	19 (2.7)	29 (4.1)	117 (16.7)	524 (74.9)
<i>IR Adult SIMS Summary Score (ranges from 2-14, with 14 as positive attitude)</i>								
	12.2 ± 2.0	--	--	--	--	--	--	--
Amotivation (AM)								
Good reasons to do PA, but do not see any	6.3 ± 1.3	477 (68.1)	115 (16.4)	38 (5.4)	34 (4.9)	18 (2.6)	10 (1.4)	8 (1.1)

Table 4. Adult SIMS Item			105					
Not sure if doing PA is worth it	6.5 ± 1.1	504 (72.0)	(15.0)	39 (5.6)	25 (3.6)	13 (1.9)	11 (1.6)	3 (0.4)
Do not see what PA brings me	6.6 ± 1.0	525 (75.0)	105 (15.0)	31 (4.4)	21 (3.0)	8 (1.1)	6 (0.9)	4 (0.6)
Not sure PA is a good thing to pursue	6.6 ± 1.1	553 (79.0)	87 (12.4)	19 (2.7)	16 (2.3)	6 (0.9)	8 (1.1)	11 (1.6)
<i>AM Adult SIMS Summary Score</i>								
<i>(ranges from 4-28, with 28 as positive attitude)</i>	25.9 ± 3.7	--	--	--	--	--	--	--
<i>Adult SIMS / PA Attitude Summary Score</i>								
<i>(ranges from 7-56, with 56 as positive attitude)</i>	49.5 ± 6.9	--	--	--	--	--	--	--

†Reversed to compute SIMS summary score

††All individual items range from 1 to 7, with 7 indicative of positive attitude toward physical activity (appropriate items reversed to compute means)

Frequency of youth ATPE- Youth SIMS. Youth attitudes toward physical education, as measured by the Youth SIMS scale are listed in Table 5. Results for all four categories of amotivation ($M = 22.3$, $SD = 6.7$) indicated 47% at or above of participants responded “corresponds not at all,” to the negative amotivation statements. Example items included “Not sure PE was a good thing to pursue” and Not sure if PE was worth it.” IM items ($M = 9.0$, $SD = 4.1$) demonstrated a division of positive and negative attitudes. Intrinsic motivation item “I remember I felt good when I was in PE” ($M = 4.4$, $SD = 2.2$), 41.2% ($n = 288$) reported “corresponds a lot” or “exactly,” while 35.2% ($n = 246$) responded to the same item as “corresponds little” to “corresponds not at all.” IR attitudes in physical education also revealed a division of positive and negative attitudes. Thirty three and a half percent ($n = 235$) of participants responded “corresponds a lot” or “corresponds exactly,” to PE was important to me” ($M = 4.0$, $SD = 2.1$), whereas 42.1% ($n = 295$) reported negatively by responding “corresponds very little” to “corresponds not at all.”

Perception of physical activity, self and physical education during 7th through 12th grade. Table 6 illustrates the frequency of the respondent’s experiences including the influence of parental exercise habits, participation in secondary school sports, number of years in PE classes, and level of satisfaction in PE class. Results indicated that 74.1% ($n = 519$) of participants reported their parents did not exercise regularly during the participants’ youth. When participants described their body type as compared to peers during adolescence, 21.5% ($n = 151$) reported to be overweight whereas 54.6% ($n = 382$) considered themselves average compared to peers. Results indicated 43.1% ($n = 302$) of adults who reported to have enrolled in PE classes,

participated for all six years (7th to 12th grade) of secondary school. One quarter, 25.2% ($n = 176$), of the participants were “mostly or completely dissatisfied” with their overall physical education experience while over one quarter, 26.1% ($n = 183$), were “neither satisfied nor dissatisfied,” resulting in 51.3% dissatisfied or disinterested. Participant response rate of 67.8% ($n = 475$) indicated they “moderately to strongly disagreed” with the statement “PE prepares youth for a lifetime of healthful PA, while 32.1% ($n = 225$) indicated they “agreed or strongly agreed.”

Emotions before, during and after physical education class (SSPEE) –AEQ.

Table 7 displays the frequencies and means computed for SSPEE before, during and after physical education class using the Academic Emotions Questionnaire (AEQ). The overall SSPEE summary score ranged from 16-80 with 80 being more positive emotions ($M = 54.0$, $SD = 17.6$). The *Emotions Before PE Class* summary score ranged from 5 to 25 with 25 being more positive emotions ($M = 17.1$, $SD = 6.0$). The results of the *Emotions Before PE Class* subscale demonstrated evidence for the embedded assumption of two separate groups/types of participants; participants who had positive emotions and those who had negative emotions regarding SSPEE. The divide between participants was shown by three of the five items related to *Emotions Before PE Class* had split responses between “strongly agree” to “strongly disagree.” Participant response rate of 41.1% ($n = 288$) indicated they “agreed to strongly agree” with the statement “I used to get excited about going to PE class” ($M = 3.0$, $SD = 1.5$), while 37.4% ($n = 262$) indicated they “disagreed to strongly disagreed.” Another example of split responses include 33.7% ($n = 236$) of participants responded they “agreed or strongly agreed” with the statement “I

looked forward to learning in PE” ($M = 2.9$, $SD = 1.4$), whereas 42.3% ($n = 296$) indicated they “disagreed or strongly disagreed.”

The *Emotions During PE Class* ($M = 26.9$ and $SD = 8.8$) summary scores ranged 8-40 with higher score being positive emotion. Over half of respondents, 51.4% ($n = 360$), did not report to be angry about physical education teachers grading standards, nor believe PE was useless, 43.1% ($n = 302$). Additional evidence of embedded assumption for separate groupings or types of participants was ascertained. Of the eight *Emotions During PE Class* items, there were five items that had split responses between “strongly agree” to “strongly disagree.” When participants responded to “Because I enjoyed PE, I recall wanting to participate” ($M = 3.3$, $SD = 1.5$), 33.1% ($n = 232$) strongly agreed, while 32.6% ($n = 226$) “disagreed to strongly disagreed.” Another example of participant divide in responses was 36.6% ($n = 256$) of participants strongly disagreed they were not “embarrassed about not being able to do a skill or activity,” whereas 32.5% ($n = 228$) “agreed and strongly agreed” to being embarrassed.

The *Emotions After PE Class* ($M = 10.0$, $SD = 3.6$) summary scores ranged from 3-15 with 15 as more positive PE emotions. Results include 43% ($n = 302$) of participants responded positively about learning in physical education ($M = 3.8$, $SD = 1.3$), while 16.6% ($n = 116$) reported to being proud of what they accomplished in physical education ($M = 3.1$, $SD = 1.4$). There was once again evidence of a divide among participants who had positive emotions and those who had negative emotions regarding SSPEE. Results indicated 38.3% ($n = 268$) of respondents reported they “agree to strongly agree” to the statement “reflecting on my accomplishments in PE made me happy” ($M = 3.0$, $SD = 1.4$), while 35.9% ($n = 251$) indicated they “disagree to strongly disagree.”

Table 5

Frequency of Youth Attitudes towards Physical Education (ATPE) (Modified Situational Motivation Scale –Youth SIMS)

(n = 700)	Mean ^{††} ± SD	Corresponds Not at All [n (%)]	Very Little	Little	Moderately	Enough	A Lot	Correspond Exactly
Intrinsic Motivation (IM)								
PE was fun [†]	4.6 ± 2.1	79 (11.3)	66 (9.4)	62 (8.9)	116 (16.6)	76 (10.9)	121 (17.3)	180 (25.7)
Felt good when I did PE [†]	4.4 ± 2.2	102 (14.6)	79 (11.3)	65 (9.3)	111 (15.9)	55 (7.9)	114 (16.3)	174 (24.9)
<i>IM Youth SIMS Summary Score</i> (ranges from 2-14, with 14 as positive attitude)	9.0 ± 4.1	--	--	--	--	--	--	--
Identified Regulation (IR)								
PE was important [†]	4.0 ± 2.1	114 (16.3)	78 (11.1)	103 (14.7)	103 (14.7)	67 (9.6)	94 (13.4)	141 (20.1)
PE was good for me [†]	5.3 ± 1.8	40 (5.7)	33 (4.7)	42 (6.0)	91 (13.0)	91 (13.0)	157 (22.4)	246 (35.1)
<i>IR Youth SIMS Summary Score</i> (ranges from 2-14, with 14 as positive attitude)	9.4 ± 3.6	--	--	--	--	--	--	--
Amotivation (AM)								
Good reasons to do PE, but did not see any	5.6 ± 1.8	349 (49.9)	94 (13.4)	77 (11.0)	86 (12.3)	34 (4.9)	32 (4.6)	28 (4.0)
Not sure if doing PE was worth it	5.5 ± 1.9	353 (50.4)	91 (13.0)	72 (10.3)	70 (10.0)	29 (4.1)	38 (5.4)	47 (6.7)
Do not see what PE brought me	5.4 ± 1.9	332 (47.4)	99 (14.1)	68 (9.7)	73 (10.4)	44 (6.3)	36 (5.1)	48 (6.9)

Table 5. Youth SIMS Item								
Not sure PE was a good thing to pursue	5.8 ± 1.8	392 (56.0)	91 (13.0)	55 (7.9)	77 (11.0)	25 (3.6)	24 (3.4)	36 (5.1)
<i>AM Youth SIMS Summary Score</i>								
<i>(ranges from 4-28, with 28 as positive attitude)</i>	22.3 ± 6.7	--	--	--	--	--	--	--
<i>Youth SIMS / PE Attitude Summary Score</i>								
<i>(ranges from 7-56, with 56 as positive attitude)</i>	40.8 ± 13.5	--	--	--	--	--	--	--

†Reversed to compute SIMS summary score

††All individual items range from 1 to 7, with 7 indicative of positive attitude toward physical activity (appropriate items reversed to compute means)

Table 6

Perception of Physical Activity, Self, and Physical Education during 7th-12th Grade

Characteristics (<i>n</i> = 700)	<i>n</i> (%)
Parents or Guardians Exercise Regularly	
No	519 (74.1)
Yes	181 (25.9)
Self-Perception as Compared to Peers	
Very Underweight	14 (2.0)
Underweight	153 (21.9)
Average	382 (54.6)
Slightly Overweight	89 (12.7)
Overweight	52 (7.4)
Very Overweight	10 (1.4)
Participation in Sport Teams	
No	243 (34.7)
Yes	457 (65.3)
Participation in Physical Education Classes during 7 th -12 th grade	
Half a school year	3 (0.4)
1 year	31 (4.4)
2 years	63 (9.0)
3 years	115 (16.4)
4 years	126 (18.0)
5 years	60 (8.6)
All years (7 th -12 th grade)	302 (43.1)
Satisfaction with Overall Physical Education Experience	
Completely Dissatisfied	46 (6.6)
Mostly Dissatisfied	130 (18.6)
Neither Satisfied or Dissatisfied	183 (26.1)
Mostly Satisfied	245 (35.0)
Completely Satisfied	96 (13.7)

Physical Education is Preparation for
Lifetime of Healthful Physical Activity

Strongly Disagree	108 (15.4)
Disagree	194 (27.7)
Neutral	173 (24.7)
Agree	140 (20.0)
Strongly Agree	85 (12.1)

Positive PC items and subscales with adult and youth SIMS and the AEQ.

Each scale in the study addressed positive and negative perceived competence (PC). All PC items in the scales were combined and formed a scale for analysis. The higher the scores the more positive attitude toward PE and PA while the lower the scores report more negative attitudes. Items that measured positive PC from the adult and youth SIMS and AEQ are summarized in Table 8. Adult ATPA –PC items from the adult SIMS ($M = 11.8$, $SD = 2.4$) ranged from 2 to 14, with the higher score being the more positive attitude. The results averaged 11.8 ($SD = 2.4$), indicating that adults responded more positively to current adult PC items. The youth ATPE- PC items from the youth SIMS ($M = 8.5$, $SD = 4.1$) had the same range as the adult SIMS. Another indication of embedded assumptions of separate types of participants was represented in the youth SIMS. Evidence of a divide among participants indicate while in secondary school PE participants had noticeably different experiences among participants; those who had positive PC in SSPEE and those who had negative PC in SSPEE.

The AEQ – PC items were embedded in AEQ's emotions during ($M = 5.2$, $SD = 2.7$) and after ($M = 6.2$, $SD = 2.7$) PE class. The *Emotions During PE* class demonstrated that 50 % had low PC and almost one quarter of the respondents had moderate PC. Half

of participants responded (49.5%, $n = 350$) they were not confident in doing skills and activities performed in PE classes ($M = 2.6$, $SD = 1.4$). The *Emotions After PE* class, (summary scores of $M = 6.2$, $SD = 2.7$), indicated another set of split responses between participants. PC item “reflecting on my accomplishments in PE, makes me happy” ($M = 3.0$, $SD = 1.4$), 38.3 % ($n = 268$) responded “agree to strongly agree,” whereas 35.9% ($n = 251$) responded “disagree” to “strongly disagree” to the statement. This provides further evidence that two types of participants had very different experiences in physical education. Adults indicated disinterest and were unconcerned of what is taught or accomplished during PE classes. Over 25% of participants in the *After PE* -PC items responded to their accomplishments in PE as indifferent.

Negative PC items and subscales with adult and youth SIMS and the AEQ.

As previously stated, each scale in the study addressed positive and negative perceived competence (PC) which were combined and formed a scale for analysis. Items were reverse coded therefore, the higher the scores the more positive attitude toward PE and PA, while the lower the scores report more negative attitudes. The negative PC items were compiled from the subscales and presented in Table 9. Adult ATPA negative PC ($M = 12.8$, $SD = 2.1$) summary scores ranged from 2 to 14 with the higher the number being as best attitude. Both the AATPA SIMS ($M = 12.8$, $SD = 2.1$) and youth ATPE SIMS ($M = 11.1$, $SD = 3.5$) had high PC. The AEQ’s negative PC of *Emotions Before PE* class ($M = 8.0$, $SD = 2.4$), displayed had similar levels of PC which indicated more positive PC before class. However, *Emotions During PE* class differed; 36.6% ($n = 256$) participants responded not being embarrassed about not being able to do a skill or activity ($M = 3.4$, $SD = 1.5$), while 32.5% ($n = 228$) participants were embarrassed.

Table 7

Emotions in Physical Education (PE) Class (SSPEE) (Academic Emotions Questionnaire – AEQ)

<i>Table 7. Emotions in SSPEE (AEQ)</i> (<i>n</i> = 700)	Item	Mean ^{††} ± SD	Strongly Disagree [<i>n</i> (%)]	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
SSPEE (total AEQ) Summary Score (<i>range from 16-80, with 80 more positive emotions</i>)		54.0 ± 17.6	--	--	--	--	--
Emotions Before PE Class							
	Excited about going to PE class [†]	3.0 ± 1.5	175 (25.0)	87 (12.4)	150 (21.4)	110 (15.7)	178 (25.4)
	Felt so nervous I would rather have skipped PE	3.9 ± 1.4	369 (52.7)	102 (14.6)	93 (13.3)	70 (10.0)	66 (9.4)
	Looked forward to learning in PE [†]	2.9 ± 1.4	161 (23.0)	135 (19.3)	168 (24.0)	105 (15.0)	131 (18.7)
	Felt pointless to go to PE since could not do the skills and activities	4.1 ± 1.2	377 (53.9)	127 (18.1)	108 (15.4)	44 (6.3)	44 (6.3)
	Confident when I went to PE [†]	3.2 ± 1.5	131 (18.7)	105 (15.0)	138 (19.7)	134 (19.1)	192 (27.4)
<i>Emotions Before PE Class Summary Score (range 5-25, w/ 25 as positive PE emotions)</i>		17.1 ± 6.0	--	--	--	--	--
Emotions During PE Class							
	Because I enjoyed PE, I wanted to participate [†]	3.3 ± 1.5	114 (16.3)	112 (16.0)	138 (19.7)	104 (14.9)	232 (33.1)
	When did anything in PE, felt like making a fool of myself	3.6 ± 1.4	273 (39.0)	140 (20.0)	111 (15.9)	96 (13.7)	80 (11.4)
	Confident because could do the skills and activities [†]	2.6 ± 1.4	212 (30.3)	138 (19.7)	149 (21.3)	120 (17.1)	81 (11.6)

<i>Table 7. Emotions in SSPEE (AEQ)</i> (<i>n</i> = 700)	Item	<i>Mean^{††} ± SD</i>	Strongly Disagree <i>[n (%)]</i>	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
	All the useless things I did in PE made me irritated	3.8 ± 1.3	302 (43.1)	128 (18.3)	129 (18.4)	83 (11.9)	58 (8.3)
	Embarrassed about not being able to do a skill or activity	3.4 ± 1.5	256 (36.6)	125 (17.9)	91 (13.0)	127 (18.1)	101 (14.4)
	Felt angry about the PE teachers' grading standards	4.0 ± 1.3	360 (51.4)	122 (17.4)	116 (16.6)	55 (7.9)	47 (6.7)
	Felt proud that I was better than others [†]	2.6 ± 1.4	212 (30.3)	138 (19.7)	149 (21.3)	120 (17.1)	81 (11.6)
	Thought about what else I could be doing rather than being in PE	3.6 ± 1.5	283 (40.4)	119 (17.0)	118 (16.9)	78 (11.1)	102 (14.6)
	<i>Emotions During PE Class Summary Score (range 8-40, w/ 40 as positive PE emotions)</i>	26.9 ± 8.8	--	--	--	--	--
<i>Emotions After PE Class</i>							
	Reflecting on my accomplishments in PE makes me happy [†]	3.0 ± 1.4	128 (18.3)	123 (17.6)	181 (25.9)	126 (18.0)	142 (20.3)
	Discouraged about the fact that I never learned anything	3.8 ± 1.3	302 (43.1)	138 (19.7)	153 (21.9)	61 (8.7)	46 (6.6)
	Proud of what I accomplished in PE [†]	3.1 ± 1.4	116 (16.6)	111 (15.9)	193 (27.6)	136 (19.4)	144 (20.6)
	<i>Emotions After PE Class Summary Score (range 3-15, w/ 15 as positive PE emotions)</i>	10.0 ± 3.6	--	--	--	--	--

†Reversed to compute summary scores

††All individual items range from 1 to 5, with 5 indicative of positive attitude toward physical education classes (appropriate items reversed to compute means)

Table 8

Positive Perceived Competence (PC+) Items and Subscales

Table 8. Positive Perceived Competence (PC+)	Mean ± SD	Corresponds Not at All [n (%)]	Very Little	Little	Moderately	Enough	A Lot	Corresp Exac
Items and Summary Scores (n = 700)								
Adult Attitudes toward Physical Activity (AATPA)								
(Adult SIMS) ^{††}								
PA is important [†]	6.0 ± 1.47	10 (1.4)	20 (2.9)	41 (5.9)	85 (12.1)	102 (14.6)	189 (27.0)	253 (
Feel good when do PA [†]	6.2 ± 1.2	6 (0.9)	8 (1.1)	14 (2.0)	40 (5.7)	52 (7.4)	185 (26.4)	395 (
PC+ Adult SIMS Summary Score								
(ranging from 2-14, w/ 14 as positive attitude)	11.8 ± 2.4	--	--	--	--	--	--	-
Youth Attitudes toward Physical Education (ATPE)								
(Youth SIMS) ^{††}								
PE was important [†]	4.0 ± 2.1	114 (16.3)	78 (11.1)	103 (14.7)	103 (14.7)	67 (9.6)	94 (13.4)	141 (
Felt good when did PE [†]	4.4 ± 2.2	102 (14.6)	79 (11.3)	65 (9.3)	111 (15.9)	55 (7.9)	114 (16.3)	174 (
PC+ Youth SIMS Summary Score								
(ranging from 2-14, w/ 14 as positive attitude)	8.5 ± 4.1	--	--	--	--	--	--	-
	Mean ± SD	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Emotions During PE (SSPEE) (AEQ) ^{†††}								
Confident because could do the skills and	2.6 ± 1.4	212 (30.3)	138 (19.2)	149 (21.3)	120 (17.1)	81 (11.6)		

Table 8. Positive Perceived Competence (PC+) Items and Summary Scores (<i>n</i> = 700)	Mean ± SD	Corresponds Not at All [<i>n</i> (%)]	Very Little	Little	Moderately	Enough	A Lot	Corresp Exac
activities [†]								
Felt proud that I was better than others [†]	2.6 ± 1.4	212 (30.3)	138 (19.7)	149 (21.3)	120 (17.1)	81 (11.6)		
<i>PC+ Emotions During PE Summary Score</i> <i>(ranging from 2-10, w/ 10 as positive emotions)</i>	5.2 ± 2.7	--	--	--	--	--		
Emotions After PE (SSPEE) (AEQ) ^{†††}								
Reflecting on my accomplishments in PE makes me happy [†]	3.0 ± 1.4	128 (18.3)	123 (17.6)	181 (25.9)	126 (18.0)	142 (20.3)		
Proud of what I accomplished in PE [†]	3.1 ± 1.4	116 (16.6)	111 (15.9)	193 (27.6)	136 (19.4)	144 (20.6)		
<i>PC+ Emotions After PE Summary Score</i> <i>(ranging from 2-10, w/ 10 as positive emotions)</i>	6.2 ± 2.7	--	--	--	--	--		

[†]Reversed to compute summary scores

^{††}All individual items range from 1 to 7, with 7 indicative of positive attitude toward physical activity (appropriate items reversed to compute means)

^{†††}All individual items range from 1 to 5, with 5 indicative of positive attitude toward physical education classes (appropriate items reversed to compute means)

Table 9

Negative Perceived Competence (PC-) Items and Subscales

Table 9. Negative Perceived Competence (PC-) Items and Summary Scores (<i>n</i> = 700)	Mean ± SD	Corresponds Not at All [<i>n</i> (%)]	Very Little	Little	Moderately	Enough	A Lot	Corresp Exact
Adult Attitudes toward Physical Activity (AATPA)								
(Adult SIMS) ^{††}								
Good reasons to do PA, but do not see any	6.3 ± 1.3	477 (68.1)	115 (16.4)	38 (5.4)	34 (4.9)	18 (2.6)	10 (1.4)	8 (1.1)
Not sure if doing PA is worth it	6.6 ± 1.1	497 (78.9)	80 (12.7)	17 (2.7)	15 (2.4)	4 (0.6)	7 (1.1)	10 (1.4)
PC- Adult SIMS Summary Score								
(ranging from 2-14, w/ 14 as best attitude)	12.8 ± 2.1	--	--	--	--	--	--	--
Youth Attitudes toward Physical Education (YATPE)								
(Youth SIMS) ^{††}								
Good reasons to do PE, but did not see any	5.6 ± 1.8	349 (49.9)	94 (13.4)	77 (11.0)	86 (12.3)	34 (4.9)	32 (4.6)	28 (4.0)
Not sure if doing PE was worth it	5.5 ± 1.9	353 (50.4)	91 (13.0)	72 (10.3)	70 (10.0)	29 (4.1)	38 (5.4)	47 (6.7)
PC- Youth SIMS Summary Score								
(ranging from 2-14, w/ 14 as best attitude)	11.1 ± 3.5	--	--	--	--	--	--	--
	Mean ± SD	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Emotions Before PE (SSPEE) (AEQ)^{†††}								
Felt so nervous would rather have skipped PE	3.9 ± 1.4	369 (52.7)	102 (14.6)	93 (13.3)	70 (10.0)	66 (9.4)		

Table 9. Negative Perceived Competence (PC-) Items and Summary Scores (<i>n</i> = 700)	<i>Mean</i> ± <i>SD</i>	Corresponds Not at All [<i>n</i> (%)]	Very Little	Little	Moderately	Enough	A Lot	Corresp Exact
Felt pointless to go to PE since could not do the skills and activities	4.0 ± 1.2	377 (53.9)	127 (18.1)	108 (15.4)	44 (6.3)	44 (6.3)		
<i>PC- Emotions Before PE Summary Score</i> (ranging from 2-10, w/ 10 as best emotions)	8.0 ± 2.4	--	--	--	--	--		
Emotions During PE (SSPEE) (AEQ) ^{†††}								
When did anything in PE, felt like making a fool of myself	3.6 ± 1.4	273 (39.0)	140 (20.0)	111 (15.9)	96 (13.7)	80 (11.4)		
Embarrassed about not being able to do a skill or activity	3.4 ± 1.5	256 (36.6)	125 (17.9)	91 (13.0)	127 (18.1)	101(14.4)		
<i>PC- Emotions During PE Summary Score</i> (ranging from 2-10, w/ 10 as best emotions)	7.1 ± 2.7	--	--	--	--	--		

[†]Reversed to compute summary scores.

^{††}All individual items range from 1 to 7, with 7 indicative of positive attitude toward physical activity (appropriate items reversed to compute means).

^{†††}All individual items range from 1 to 5, with 5 indicative of positive attitude toward physical education classes (appropriate items reversed to compute means).

Analysis of Hypothesis 1: Influence of SSPEE on ATTPA

Diagnostics for the Multiple Linear Regression Analysis. Hypothesis 1 stated that when controlling for other variables, SSPEE was to be related to AATPA. Diagnostic testing was conducted to examine the normality of residuals, homogeneity of variance, and multicollinearity among the predictors before testing the hypothesis. The dependent variable of current adult attitudes toward physical activity (Adult SIMS summary score) displayed slight non-normality (see Figures 6- 7). Generally, parametric statistics are robust to violations of non-normality if there is adequate sample size and data are controlled. This study had adequate sample size ($N = 777$), and though distribution groups were defined and controlled to decrease non-normality, subgroup distribution was not, since it was not the study's focus. Homogeneity of variance was established, as shown in Figure 8.

Multicollinearity ($VIF > 3.0$ and $Tolerance < 0.33$) was detected for two dummy variables in the models – underweight vs. overweight ($VIF = 3.370$, $Tolerance = 0.297$) and average vs. overweight self-reported body type in secondary school ($VIF = 3.855$, $Tolerance = 0.259$). However, the two dummy variables were retained in the analysis due to their possible confounding bias (Bell & Morgan, 2000; Trout & Graber, 2009)

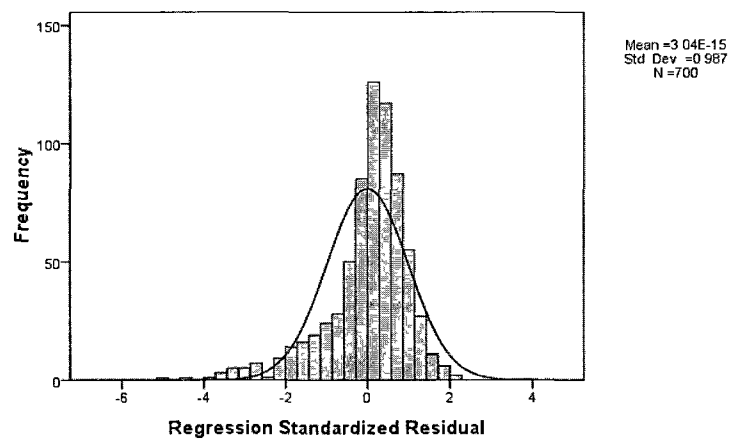


Figure 6. Histogram of the Standardized Residuals Assessing Normality for Current Adult Attitudes toward Physical Activity (AATPA - Adult SIMS Summary Score)

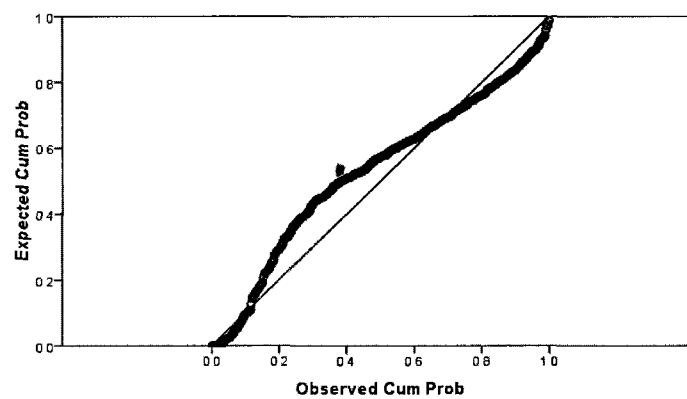


Figure 7. Normal P-P Plot of Regression Standardized Residual Assessing Normality for Current Adult Attitudes toward Physical Activity (AATPA-Adult SIMS Summary Score)

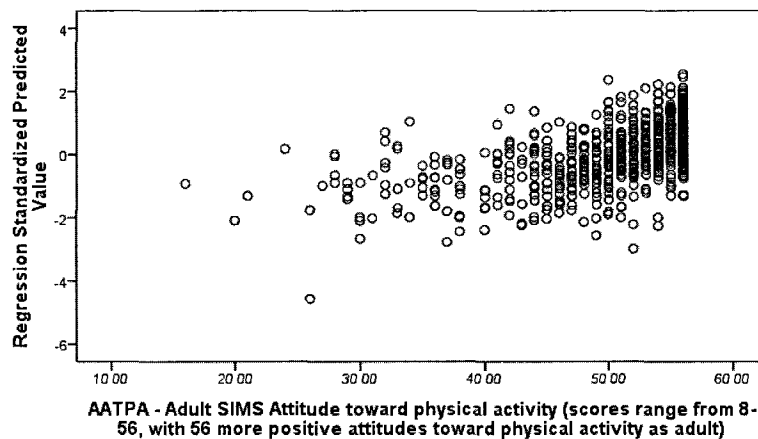


Figure 8. Scatterplot of Standardized Residuals and Predicted Values Assessing Homogeneity of Variance of Current Adult Attitudes toward Physical Activity (AATPA - Adult SIMS Summary Score)

Multiple Linear Regression Analysis. Multiple linear regression analysis was performed to determine if SSPEE was to be related to AATPA (see Table 10):

- First block included; demographic and other covariates
- Second block integrated: SSPEE (Total AEQ – combination of emotions before, during, and after physical education class in secondary school) in order to explain AATPA the adult SIMS summary score (range from 8-56, with 56 indicative of more positive attitudes toward physical activity as an adult)

After controlling for the demographic characteristics and covariates, the SSPEE variable significantly contributed to the model as evidenced by a significant *F* Change statistic and the increase in R^2 by 0.046 to an overall R^2 of 0.272 (or adjusted R^2 of 0.254). Hence, Model 2 in Table 10 will be summarized in the text below.

Data analysis indicated five independent variables statistically associated with AATPA (Model 2 in Table 10):

- Combined self-reported emotions before, during, and after PE class summary score (SSPEE) ($b = 0.109$)
- Respondents older than 55 versus those 18-35 years of age ($b = -1.960$)
- BMI ($b = -0.202$)
- Current physical activity per week (in days/week) ($b = 1.132$)
- All 6 Years of PE participation in secondary school versus only ½ to 2 years ($b = -1.551$)

For every point increase in the total SSPEE summary score, the AATPA summary score increased by 0.109 on average. Thus, increasingly positive emotions associated before, during, and after PE classes in secondary school are associated with more positive attitudes toward physical activity among the adult respondents. Participants older than age 55 years demonstrated a mean of AATPA summary score that was 1.960 points lower than participants who were age 18-35 years. Body mass index was negatively related to AATPA – after controlling for all other variables, for every unit increase in BMI, the AATPA summary score decreased by 0.202 on average. Days of physical activity per week were positively associated to AATPA. After adjusting for other covariates, for every day increase in current physical activity the AATPA summary score increased by 1.132 points on average. The mean AATPA summary score was 1.551 points lower for persons who reported having PE in all six years of secondary school, as compared to experiencing PE for one semester to two years.

Overall, 25.4% of the variability in AATPA was explained by all the independent variables (adjusted $R^2 = 0.254$), whereas 4.6% was the unique variability of AATPA that was accounted for by just SSPEE summary score. In order to determine the additional variation SSPEE had on AATPA beyond the normal covariates the following regression equation was used:

Predicted $y = 46.256 + 0.109$ (overall SSPEE summary score) $- 0.086$ (female vs. male gender) $- 0.379$ (36-55 vs. 18-35 year olds) $- 1.960$ (56+ vs. 18-35 year olds) $- 0.202$ (BMI) $+ 1.132$ (Current physical activity in days/wk) $+ 1.374$ (Not diagnosed with medical condition precluding exercise vs. Diagnosed with condition) $+ 0.139$ (Hours worked per day) $- 0.591$ (3 years of PE vs. ½-2 years) $+ 0.117$ (4 years of PE vs. ½-2 years) $- 1.465$ (5 years of PE vs. ½-2 years) $- 1.551$ (All 6 years of PE vs. ½-2 years) $+ 0.469$ (Parents exercised vs. did not exercise) $- 0.379$ (Participated in sports in secondary school vs. no participation) $- 0.709$ (Perceived body type in youth as very underweight/underweight vs. overweight/very overweight) $- 1.274$ (Perceived body type in youth as average vs. overweight/very overweight) $- 0.854$ (Perceived body type in youth as slightly overweight vs. overweight/very overweight).

Positive attitudes of physical education in secondary school and more days per week of current exercise were associated with more positive attitudes towards physical activity in adulthood. In addition, BMI was inversely related to attitudes towards physical activity in adulthood. That is, the higher BMI was related to less positive current attitudes toward physical activity. Participants who were age 56 years or older reported a less positive attitude toward physical activity as compared to their younger counterparts, ages 18-35 years. In comparison to participants who experienced PE from one semester to 2 years,

respondents who experienced physical education all six years of school displayed a lower mean AATPA score. This indicates that the more years in secondary school physical education classes the less likely to have a positive attitude toward physical activity.

Analysis of Hypothesis 2: PC on SSPEE and AATPA

Multiple Linear Regression Analysis. When controlling for other variables, perceived competence (PC) in physical education courses during secondary school was expected to explain the variation between secondary school physical education experiences and attitudes toward physical activity. Multiple linear regression analysis was computed to determine if PC explained the variation between SSPEE and AATPA (see Table 10):

- First block included: demographic and other covariates [Model 1]
- Second block integrated: SSPEE (Total AEQ – combination of emotions before, during, and after physical education class in secondary school) [Model 2]
- Third block included: PC (summary score of the four perceived competence items within the youth SIMS scale) in order to explain AATPA – the adult SIMS summary score (range from 8-56, with 56 indicative of positive attitude toward physical activity as an adult) [Model 3]

Therefore, Model 2 and Model 3 were compared to determine if perceived competence was significant when controlling for other variables. After controlling for the covariates and SSPEE, PC significantly contributed to the model as evidenced by significant F change statistic and increased R^2 by 0.010 to an overall R^2 of 0.282 (or adjusted R^2 of 0.263) (F -change = 9.511, $p = .002$). Model 3 in Table 10 will be summarized in the text below. Although this indicates that PC in secondary physical

education is positively related to AATPA, it only accounted for 1% of additional variation in the explanation of AATPA.

As shown in Model 3, there are five independent variables associated with AATPA.

- (1) BMI ($b = -0.199$)
- (2) Perceived competence of secondary school physical education classes summary score (PC) ($b = 0.225$)
- (3) Current physical activity per week (in days/week) ($b = 1.142$)
- (4) All 6 Years of PE participation in secondary school versus only ½ to 2 years ($b = -1.703$)
- (5) Respondents older than 55 versus those 18-35 years of age ($b = 2.014$)

Adding perceived competence (PC) to the model altered the relationship between SSPEE and AATPA. Therefore SSPEE was no longer associated with AATPA. After controlling for all other covariates, for every point increase in the PC summary score, the AATPA summary score increased an average of 0.225. Therefore, greater perceived competence in physical education classes in secondary school was associated with more positive attitudes toward physical activity as an adult. Following the addition of the PC summary score, SSPEE was no longer associated with AATPA ($b = 0.028$, $SE = 0.031$, $p = 0.361$).

Participants older than age 55 years demonstrated a mean AATPA summary score 2.014 points lower than their younger (ages 18-35 years) counterparts. Body mass index was negatively related to AATPA – after controlling for all other variables, for every unit increase in BMI, the AATPA summary score decreased by 0.199 on average. Days of physical activity per week were positively associated to AATPA. For every day of

increased current physical activity, the AATPA summary score increased by 1.142 points on average. The mean AATPA summary score was 1.703 points lower in those who reported having PE for all 6 years in secondary school as compared to only 1/2 to 2 years of PE.

Overall, 26.3% of the variability in AATPA was explained by the independent variables (adjusted $R^2 = 0.263$). The regression equation is as follows:

Predicted $y = 46.254 + 0.225$ (PC summary score) $+ 0.028$ (overall SSPEE summary score) $- 0.057$ (female vs. male gender) $- 0.445$ (36-55 vs. 18-35 year olds) $- 2.014$ (56+ vs. 18-35 year olds) $- 0.199$ (BMI) $+ 1.142$ (Current physical activity in days/wk) $+ 1.386$ (Not diagnosed with medical condition precluding exercise vs. Diagnosed with condition) $+ 0.127$ (Hours worked per day) $- 0.699$ (3 years of PE vs. 1/2-2 years) $- 0.040$ (4 years of PE vs. 1/2-2 years) $- 1.470$ (5 years of PE vs. 1/2-2 years) $- 1.703$ (All 6 years of PE vs. 1/2-2 years) $+ 0.358$ (Parents exercised vs. did not exercise) $- 0.296$ (Participated in sports in secondary school vs. no participation) $- 0.645$ (Perceived body type in youth as very underweight/underweight vs. overweight/very overweight) $- 1.256$ (Perceived body type in youth as average vs. overweight/very overweight) $- 0.909$ (Perceived body type in youth as slightly overweight vs. overweight/very overweight).

Two factors, perceived competence in physical education classes in secondary school, and more days per week of current exercise, were associated with more positive attitudes towards physical activity in adulthood. In addition, BMI was inversely related to attitudes towards physical activity in adulthood. That is, the greater the BMI, the less positive current attitudes toward physical activity. Interestingly, participants who experienced

physical education for six years displayed a lower mean AATPA score than participants that had physical education for a semester to two years in secondary school.

Analysis of Hypothesis 3: Types of Attitudes Related to PC and SSPEE

It was hypothesized that the type of adult attitude toward physical activity will be related to both PC and SSPEE. It was found based on the analysis from Hypothesis #2, that participants with negative AATPA displayed a lower PC, as compared to individuals reporting a positive AATPA, who displayed higher PC. In the full model [Table 10, Model 3], SSPEE was no longer significantly related to AATPA after PC was entered into the model.

Analysis of Hypothesis 4: Relationship of IM to SSPEE and AATPA

Diagnostics for the Multiple Linear Regression Analysis. Hypothesis 4 stated that IM of AATPA is related to past emotions regarding PE class (SSPEE) and past attitudes toward physical education (ATPE). Diagnostic testing was conducted to examine the normality of residuals, homogeneity of variance, and multicollinearity among the predictors. The dependent variable of intrinsic motivation of current adult attitudes toward physical activity (IM subscale of Adult SIMS) graphically displayed normality (see Figures 9-10). Homogeneity of variance was established (see Figure 11).

Multicollinearity ($VIF > 3.0$ and $Tolerance < 0.33$) was detected for four variables in the model – underweight vs. overweight ($VIF = 3.462$, $Tolerance = 0.289$), average vs. overweight self-reported body type in secondary school ($VIF = 3.918$, $Tolerance = 0.255$), SSPEE ($VIF = 5.611$, $Tolerance = 0.178$), and youth ATPE ($VIF = 5.077$, $Tolerance = .197$). The secondary school body type variables were retained in the analysis due to their possible confounding bias as reported in the literature. Likewise,

SSPEE and ATPE summary scores were retained since they were the primary independent variables of interest.

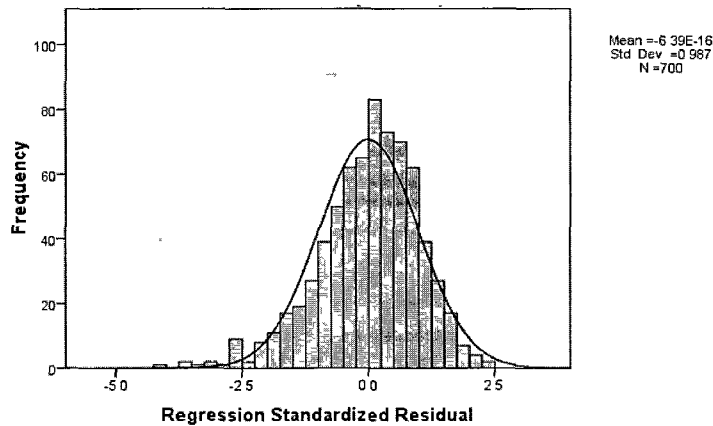


Figure 9 Histogram of the Standardized Residuals Assessing Normality for Intrinsic Motivation of Current Adult Attitudes toward Physical Activity (IM subscale of Adult SIMS Summary Score)

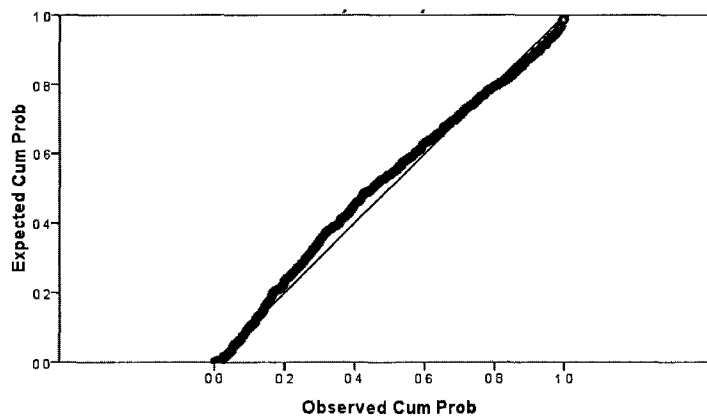


Figure 10. Normal P-P Plot of Regression Standardized Residual Assessing Normality for Intrinsic Motivation of Current Adult Attitudes toward Physical Activity (IM subscale of Adult SIMS Summary Score)

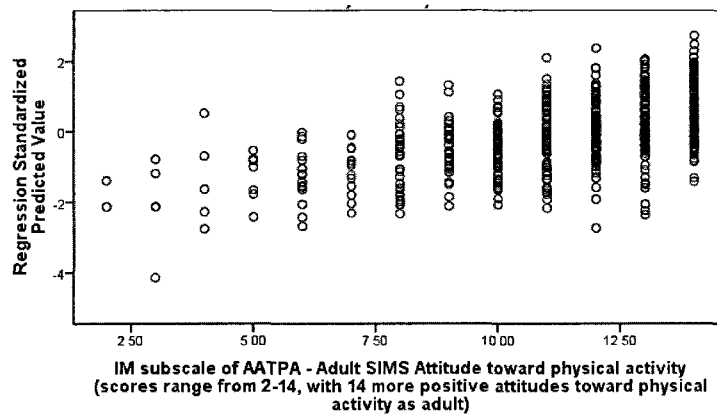


Figure 11. Scatterplot of Standardized Residuals and Predicted Values Assessing Homogeneity of Variance of Intrinsic Motivation of Current Adult Attitudes toward Physical Activity (IM subscale of Adult SIMS Summary Score)

Multiple Linear Regression Analysis. A hierarchical multiple linear regression was calculated to assess if SSPEE and past attitudes toward PE help to explain the IM of AATPA (see Table 11).

- First block included: demographic and other covariates [Model 1]
- Second block integrated SSPEE (Total AEQ – combination of emotions before, during, and after physical education class in secondary school) and ATPE (Total Youth SIMS scale) were entered to explain the IM AATPA summary score of AATPA [Model 2]

After controlling for the demographic characteristics and covariates, SSPEE and ATPE variables significantly contributed to the model as evidenced by significant F Change statistic and the increase in R^2 by 0.080 to an overall R^2 of 0.319 (or adjusted R^2

of 0.301). When examining Model 2 in Table 11, there were eight independent variables statistically associated with the IM subscale of adult SIMS scale (IM AATPA):

- (1) Combined self-reported emotions before, during, and after PE class summary score (SSPEE) ($b = 0.024$)
- (2) Youth attitude toward physical education classes (ATPE) ($b = 0.036$)
- (3) BMI ($b = -0.065$)
- (4) Current physical activity per week (in days/week) ($b = 0.374$)
- (5) Respondents 36-55 versus those 18-35 years of age ($b = -0.395$)
- (6) 5 Years of PE participation in secondary school versus only ½ to 2 years ($b = -0.705$)
- (7) All 6 Years of PE participation in secondary school versus only ½ to 2 years ($b = -0.722$)
- (8) Respondents older than 55 versus those 18-35 years of age ($b = -0.988$)

After controlling for all other covariates, for every point increase in the total SSPEE summary score, the IM subscale summary score increased by 0.024, on average. Thus, increasingly positive emotions associated before, during, and after PE classes in secondary school are associated with more intrinsically motivated attitudes toward physical activity as an adult. Likewise, for every point increase in the total ATPE summary score, the IM subscale summary score increased by 0.036, on average, after covariate adjustment.

Age was negatively related to intrinsic motivation. Participants who were 36-55 and older than 55 years of age demonstrated a mean IM subscale summary score that was

statistically lower than those who were 18-35 years old (mean difference of -0.395 and -0.988 respectively). Body mass index was also negatively related to IM AATPA – after controlling for all other variables, for every unit increase in BMI, the IM subscale summary score decreased by 0.065 on average. Days of physical activity per week were positively associated to IM. After adjusting for other covariates, for every day increase in current physical activity, the IM subscale summary score increased by 0.372 points on average. Lastly, the mean IM AATPA subscale summary score was 0.705 and 0.722 points lower in those who reported having PE for 5 years and PE for all 6 years in secondary school as compared to only 1/2 to 2 years.

The first block of predictors included all the covariates. The second block of predictors included the total SSPEE summary score evaluating emotions before, during and after physical education classes during 7th-12th grade and the ATPE summary score assessing attitudes toward physical education classes. Therefore, two models were produced – Model 1 with only covariates, and Model 2 with covariates plus the SSPEE and ATPE variables. 30.1% of the variability in the IM subscale of AATPA was explained by all the independent variables (adjusted $R^2 = 0.301$). SSPEE and ATPE added 8% variation above and beyond the covariates. The regression equation is as follows:

Predicted $y = 9.942 + 0.024$ (overall SSPEE summary score) $+ 0.036$ (overall ATPE summary score) $- 0.313$ (female vs. male gender) $- 0.395$ (36-55 vs. 18-35 year olds) $- 0.988$ (56+ vs. 18-35 year olds) $- 0.065$ (BMI) $+ 0.372$ (Current physical activity in days/wk) $+ 0.473$ (Not diagnosed with medical condition precluding exercise vs. Diagnosed with condition) $+ 0.030$ (Hours worked per day) $- 0.435$ (3 years of PE vs. 1/2-2 years) $+ 0.133$ (4 years of PE vs. 1/2-2 years) $- 0.705$ (5 years of PE vs. 1/2-2

years) – 0.722 (All 6 years of PE vs. ½-2 years) + 0.210 (Parents exercised vs. did not exercise) – 0.324 (Participated in sports in secondary school vs. no participation) – 0.043 (Perceived body type in youth as very underweight/underweight vs. overweight/very overweight) – 0.030 (Perceived body type in youth as average vs. overweight/very overweight) + 0.253 (Perceived body type in youth as slightly overweight vs. overweight/very overweight).

Results indicate positive adult IM emotions were associated to three outcomes: (1) physical education experiences in secondary school, (2) positive attitudes of physical education classes, and (3) more days per week of current exercise. Thus, more positive IM emotions the more likely to adults have positive attitudes towards physical activity in adulthood. This indicated that IM in physical education experiences in secondary school influences adulthood attitudes toward PA. Secondly, age and BMI are inversely related to intrinsic motivation. The older the respondent was and the greater the BMI, the less intrinsic motivation. Thus, signifying the older and more overweight an adult is the less likely the adult is to have high levels of IM. Those who had physical education for five or all six years displayed a lower mean intrinsic motivation subscale summary score than participants that had physical education for a semester to two years in secondary school. This indicates the more years in physical education the less likely to have high levels of IM as an adult.

Table 10

Multiple Linear Regression Estimates of the Association of Previous SSPEE, PC and AATPA

<i>Table 10. MLR – SSPEE, PC, and AATPA</i> (<i>n</i> = 700)	<i>Model 1</i>	<i>Model 2 with SSPEE</i>	<i>Model 3 with SSPEE and PC</i>
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Constant/Intercept:	48.744 (2.242)***	46.256 (2.210)***	46.254 (2.197)***
<u>Perceived Competence in Physical Education Classes (PC):</u>			
Perceived competence summary score (PC items in Youth SIMS scale)	--	--	0.225 (0.073)**
<u>Previous Secondary School Physical Education Experiences (SSPEE):</u>			
Emotions before, during, and after PE class summary score (AEQ total score)	--	0.109 (0.017)***	0.028 (0.031)
<u>Covariates:</u>			
Gender			
Female	-0.711 (0.520)	-0.086 (0.513)	-0.057 (0.510)
Male	<i>ref</i>	<i>ref</i>	<i>ref</i>
Age			

<i>Table 10. MLR – SSPEE, PC, and AATPA (n = 700)</i>	<i>Model 1</i>	<i>Model 2 with SSPEE</i>	<i>Model 3 with SSPEE and PC</i>
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
18-35	<i>ref</i>	<i>ref</i>	<i>ref</i>
36-55	-0.371 (0.555)	-0.379 (0.539)	-0.445 (0.536)
56 or older	-1.803 (1.020)	-1.960 (0.990)*	-2.014 (0.984)*
Body Mass Index (BMI)	-0.199 (0.046)***	-0.202 (0.044)***	-0.199 (0.044)***
Current physical activity per week (in days/week)	1.190 (0.126)***	1.132 (0.123)***	1.142 (0.122)***
Diagnosed medical condition precluding exercise			
Yes	<i>ref</i>	<i>ref</i>	<i>ref</i>
No	1.940 (1.007)	1.374 (0.981)	1.386 (0.975)
Hours worked per day	0.177 (0.081)*	0.139 (0.079)	0.127 (0.079)
Years of PE participation			
½ to 2 years	<i>ref</i>	<i>ref</i>	<i>ref</i>
3 years	-0.322 (0.861)	-0.591 (0.837)	-0.699 (0.833)
4 years	0.861 (0.852)	0.117 (0.834)	-0.040 (0.831)
5 years	-0.557 (1.029)	-1.465 (1.008)	-1.470 (1.002)
All 6 years	-0.370 (0.747)	-1.551 (0.747)*	-1.703 (0.744)*
Parents exercised during secondary school			
Yes	0.817 (0.553)	0.469 (0.539)	0.358 (0.537)
No	<i>ref</i>	<i>ref</i>	<i>ref</i>

<i>Table 10. MLR – SSPEE, PC, and AATPA (n = 700)</i>	<i>Model 1</i>	<i>Model 2 with SSPEE</i>	<i>Model 3 with SSPEE and PC</i>
	<i>b (SE)</i>	<i>b (SE)</i>	<i>b (SE)</i>
Sports participation during 7th-12th grade			
Yes	1.190 (0.520)*	-0.379 (0.558)	-0.296 (0.556)
No	ref	ref	ref
Self-reported body type in youth			
Very underweight or underweight	0.146 (1.010)	-0.709 (0.989)	-0.645 (0.983)
Average	-0.235 (0.913)	-1.274 (0.901)	-1.256 (0.895)
Slightly overweight	-0.460 (1.042)	-0.854 (1.013)	-0.909 (1.007)
Overweight or very overweight	ref	ref	ref
<u>Model R^2 and F Change Statistics:</u>			
<i>F</i>	<i>F</i> (16,683) = 12.496***	<i>F</i> (17, 682) = 15.001***	<i>F</i> (18, 681) = 14.873***
<i>R</i> ²	0.226	0.272	0.282
Adjusted <i>R</i> ²	0.208	0.254	0.263
<i>R</i> ² Change	--	0.046	0.010
<i>F</i> Change	--		9.511**

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 11

Multiple Linear Regression Estimates of the Association of Previous SSPEE, Youth ATPE, and IM of AATPE

<i>MLR – SSPEE, Youth ATPE and IM of AATPA</i> (<i>n</i> = 700)	<i>Model 1</i>	<i>Model 2 with SSPEE and ATPE</i>
	<i>b (SE)</i>	<i>b (SE)</i>
Constant/Intercept:	11.115 (0.777)***	9.942 (0.748)***
<u>Previous Secondary School Physical Education Experiences (SSPEE):</u>		
Emotions before, during, and after PE class summary score (AEQ total score)	--	0.024 (0.010)*
<u>Youth Attitudes toward Physical Education (ATPE):</u>		
Attitudes toward Physical Education (Youth SIMS total score)	--	0.036 (0.013)**
<u>Covariates:</u>		
Gender		
Female	-0.604 (-0.180)**	-0.313 (0.174)
Male	<i>ref</i>	<i>ref</i>
Age		
18-35	<i>ref</i>	<i>ref</i>
36-55	-0.386 (0.192)*	-0.395 (0.182)*
56 or older	-0.900 (0.353)*	-0.988 (0.335)**
Body Mass Index (BMI)	-0.063 (0.016)***	-0.065 (0.015)***
Current physical activity per week (in days/week)	0.391 (0.044)***	0.372 (0.042)***
Diagnosed medical condition precluding exercise		
Yes	<i>ref</i>	<i>ref</i>
No	0.757 (0.349)*	0.473 (0.332)
Hours worked per day	0.050 (0.028)	0.030 (0.027)

<i>MLR – SSPEE, Youth ATPE and IM of AATPA</i> (<i>n</i> = 700)	<i>Model 1</i>	<i>Model 2 with SSPEE and ATPE</i>
	<i>b (SE)</i>	<i>b (SE)</i>
Years of PE participation		
½ to 2 years	<i>ref</i>	<i>ref</i>
3 years	-0.285 (0.299)	-0.435 (0.283)
4 years	0.248 (0.295)	-0.133 (0.283)
5 years	-0.288 (0.356)	-0.705 (0.341)*
All 6 years	-0.154 (0.259)	-0.722 (0.253)**
Parents exercised during secondary school		
Yes	0.401 (0.192)*	0.210 (0.183)
No	<i>ref</i>	<i>ref</i>
Sports participation during 7th-12th grade		
Yes	0.356 (0.180)*	-0.324 (0.189)
No	<i>ref</i>	<i>ref</i>
Self-reported body type in youth		
Very underweight or underweight	0.327 (0.350)	-0.043 (0.335)
Average	0.427 (0.317)	-0.030 (0.305)
Slightly overweight	0.464 (0.361)	0.253 (0.343)
Overweight or very overweight	<i>ref</i>	<i>ref</i>
<u>Model R^2 and F Change Statistics:</u>		
<i>F</i>	$F(16,683) = 13.394^{***}$	$F(18,681) = 17.697^{***}$
R^2	0.239	0.319
Adjusted R^2	0.221	0.301
R^2 Change	--	0.080

* $p < .05$, ** $p < .01$, *** $p < .001$

Chapter V

Discussion

The purposes of this study were: (a) to examine the relationship between attitudes toward physical activity and the positive versus negative previous experiences in secondary school physical education classes, (b) to assess the extent to which perceived competence (PC) experienced in secondary school physical education (SSPEE) classes are related to adult attitudes toward physical activity (AATPA), (c) to examine the type of adult attitudes toward physical activity is related to both PC and SSPEE, and (d) to assess the relationship between AATPA and intrinsic motivation (IM) as experienced in secondary school physical education class. Five hierarchical multiple linear regression (MLR) models were tested, one general model, two PC models, and two IM models. The finding of this study examined the relationship between SSPEE on AATPA and includes unedited narrative from participants.

The results of this study support the first hypothesis that SSPEE was significantly related to AATPA. Thus, adults who reported more negative SSPEE were more likely to report poorer attitudes toward physical activity than adults who had positive SSPEE. The second hypothesis, that PC in secondary school physical education classes would be related to AATPA, was supported yet only accounted for 1% of additional variation from the results of this study. Even though PC in secondary school physical education explained the variability of AATPA, the addition of the PC summary score caused SSPEE to no longer being statistically significant to AATPA. The third hypothesis, the type of attitude toward physical activity would be related to both PC and SSPEE, was not supported. AATPA was related to both PC and SSPEE however in the final model the

addition of the PC summary score, SSPEE became not statistically significant to AATPA. Reasons suggested for this occurrence are explained in this chapter. The fourth hypothesis, IM would be related to SSPEE and AATPA, was supported. It was found that adults IM toward physical activity is related to past emotions regarding PE class (SSPEE) and past attitudes toward physical education (ATPE).

Relationship between SSPEE on AATPA

The results indicated that SSPEE significantly predicted AATPA. Specifically, the study showed positive emotions that occur in secondary school physical education classes were associated with positive attitudes toward physical activity among young and middle-aged adults. For instance, according to one participant, “I looked forward to physical education every day.” Another respondent stated, “When I left public school in Alabama, and went to a boarding school, we had a PE option called ‘Aerobic Walking,’ which we left campus as a class and walked around the neighborhood; walking and jogging outside of a gym setting, and out around town it is still my favorite form of physical activity.”

The results also revealed an inverse relationship between BMI and attitudes towards physical activity in adulthood. The greater the BMI the participant had the less positive their attitude. One participant’s comment regarding body mass was, “PE is a nightmare for obese teens-public humiliation! I was very nervous about starting up with a fitness trainer because of the rotten experience I had as a teen and I am 51!” Respondents who participated in secondary school physical education classes for six years reported lower AATPA scores than respondents who completed a semester to two years of physical education classes. This result suggests that the longer students

participate in secondary school physical education classes the less likely they will report a positive attitude toward physical activity. This conclusion is further supported by a comment by one participant: “PE was the biggest waste of time and school funding I have ever encountered. It should be an elective after 6th grade. Seriously.”

This result reflected the findings of previous studies regarding experiences that influence AATPA. Engstrom’s (2008) 38-year follow-up study revealed that positive experiences in sport and activity programs were associated with adult physical activity participation. Prior studies also support the inverse relationship between BMI and AATPA. Participants who had increased BMI were less likely to have positive SSPEE. Trout and Graber’s (2009) case studies of overweight young adults revealed that many participants avoided any type of physical activity due to traumatizing experiences in their physical education class, often due to the actions of their physical education teachers. Physical educators must reconsider current curriculum and teaching strategies as well as long term objectives for secondary students in physical education. Moreover, physical educators, as well as teacher educators need to promote more positive experiences for secondary school students.

Physical education experiences for students who were overweight and obese had considerably different experiences than those more skilled and considered fit. Sykes and McPhail (2009) indicated adults who were overweight in secondary school recalled humiliation, physical assault, dangerous play, sexual harassment and injustice in physical education classes. This corresponds with this study’s participant comments about physical education experiences. One respondent’s memory about their physical education experience commented, “Others making fun because I was overweight and not

coordinated. Always chosen last if at all for team sports.” Another participant recalled the humiliation and injustice of other students in class by a physical education teacher, “I remember the physical education teacher choosing those students who were bigger/not as in shape as the other students and having just those kids run laps in front of us (the other students). He was punishing them with embarrassment because they could not perform as well as the rest of us.” This finding was consistent with Trout and Graber (2009) who reported that lower-skilled and obese students experienced discrimination by their physical education teachers.

Another participant recalled the humiliation and injustice of other students in class by a physical education teacher, “I remember the physical education teacher choosing those students who were bigger/not as in shape as the other students and having just those kids run laps in front of us (the other students). He was punishing them with embarrassment because they could not perform as well as the rest of us.” This supports the hypothesis, attitudes toward physical education influence adult attitudes. The finding indicate physical education teachers’ choice of curriculum, teaching strategies and type of motivation used in teaching influenced youth and their adult attitudes.

Relationship between PC on SSPEE and AATPA

Hypothesis 2 indicated that PC explained the variability of SSPEE and AATPA. That is, increased PC was related to increased AATPA. These results suggest that having more positive attitudes toward physical activity in adulthood and in secondary school physical education classes is related to PC. Though results of the current study demonstrated PC had a slight relationship to AATPA, it confirmed earlier findings. Wrench and Garrett (2008) assert that positive attitudes toward physical activity in

adulthood and in SSPEE were related to PC. They revealed adults who attained successful performance and results in physical education class had positive recollections of fun and camaraderie with like-minded and successful peers in their class. These participants knew of themselves as successful and desirably fit in comparison to others who were known not to be this way. Wrench and Garrett, results showed adults who were not as skilled had lower PC and were more likely to have negative experiences and attitudes toward fitness.

Participants in the current study substantiate Wrench and Garrett's results. For instance, one participant recalls being successful as compared to others:

I had always enjoyed PE and the opportunity for myself to excel. A fond memory I have was my junior year playing flag football. The majority of the guys were our varsity football players. I did better than their quarter back consistently and also excelled as a wide receiver. It was a great feeling as I had not played football in school, only pickup games. The guys on the team were really encouraging me to try out for my senior year. I have a lot of fond memories of PE and to this day physical activity is still very important to me and an integral part for me in motocross and other activities. It is also important for me to pass this on to my boys.

Another participant recalls a negative physical education experience as they compare themselves to others:

My school did the physical fitness thing where you won awards (Presidential, National...). I don't remember what it was called or if schools across the country do it or if it's just a Virginia thing or what but I hated it. One section was

flexibility. My dad has back problems and I assume this is why I have problems with flexibility. I never could do the flexibility test – not enough to qualify for an award, not even enough to meet the level that was considered 'healthy.' I had one teacher who pushed me so hard on it that she made me cry. I remember being amazed that the other girls in my class could make it to 30 or 40+ inches while I could barely make it to 15. Also, since you had to do award level in each category, it meant I could never win an award. So I didn't try on the other tests. If I'm not flexible enough, why try to run faster, do more crunches, or do the arm hang longer. What was the point?

The current study's results indicated an inverse relationship between PC and BMI. That is, as BMI increased PC and positive attitudes toward physical activity decreased. It is reasonable to conclude, therefore, that overweight and obese adults are more likely to have less PC and less positive attitudes toward physical activity. This finding was supported by several studies. Sollerhed, Apitzsch, Rastam, and Ejlertsson (2008) found that perceived competence has an association between physical education, body composition, and future physical activity. In another study, Jones, Okely, Caputi, and Cliff (2010) revealed overweight students had lower PC than non-overweight school-aged students in physical education. This confirms differences between weight status and physical activity-related characteristics among individuals. With 57.3% of participants considered obese in this study, further research is needed to determine if adults who were overweight in secondary school and are currently overweight have low PC due to SSPEE early in life.

Inverse relationships were also found as a function of the number of years students experienced in physical education classes. Specifically, number of years participating in secondary school physical education class was related to low PC and less positive attitudes toward physical activity and physical education. Therefore, it is reasonable to conclude that students do not perceive their experiences in secondary physical education classes as positive. Apparently, their participation is not promoting lifetime habits of physical activity. In fact, quite the opposite is occurring, in which experiences in physical education class are leading to reduced PC and less enjoyment.

Relationship between Types of Attitudes on PC and SSPEE

It was hypothesized in this study that the type of attitudes toward physical activity will be related to both PC and SSPEE. The results of this study indicated that the type of PC influenced AATPA; participants with poor AATPA displayed low PC while those reporting a positive AATPA displayed a high PC. The outcome reflects that participants, in this case, established a type of perceived competence with physical activity during secondary school physical education that influenced their attitudes toward PA as an adult. This is consistent with Mears (2007) who reported that adults' physical activity competence was related to the participants' high school physical education experiences.

The results did not support the type of attitudes toward physical activity's relationship to both PC and SSPEE. The final model, with the addition of the PC summary score, showed SSPEE was not statistically significant to AATPA. However, participants written comments revealed the likelihood that PC was an embedded factor in SSPEE. Thus, participant comments about their experiences as physical education students in secondary school signify PC was part of SSPEE.

When asked to describe a positive memory or experience of their PE classes one participant demonstrated the concept of PC as an integral part of SSPEE by stating, “PE was probably the single most God-awful experience in my life. I hated it. I was so stressed out before and during class (because of my inabilities) that the emotional scars remain with me today.” Another participant stated, “I have none. It was miserable, horrible, and an overall awful experience.” Other participants stated high levels of PC in physical education. A respondent stated, “I was really good at serving when we played volleyball in 8th grade; I was also still taller than a lot of my classmates and I remember looking forward to the days when we played volleyball,” and “I enjoyed PE. However I was very good in all sports.” Another participant stated, “I did have fun sometimes, enjoyed interacting with others but was always small and wasn’t really strong enough to do really well.”

Examples of low PC and attitudes within secondary school physical education include participant comments like, “Learning my place as a non-athlete and being made fun of by other kids. The coaches were often pretty jerky,” and “I remember not being as proficient as the other kids in PE. I was very self-conscious just because I never was as proficient as the others. Of course being picked last happened frequently and I wish teachers would not use that system because it was a very negative system for me and probably other students as well.” Another respondent stated, “I remember being lined up with all of the other boys and the gym teacher organized us by what he considered to be his evaluation of our physical abilities; those who were substandard were insulted in front of the class and told we were lazy and worthless.” This is supported by Morgan and Bourke’s (2008) study of adults’ nature and influences of personal PE school experiences

support the contention that the type of SSPEE influences future behaviors toward physical activity. Morgan and Bourke found that student' negative experiences in secondary school PE influenced PC and level of physical activity in adults 18- 30 years of age.

In summary, participant's written memories suggest PC is viewed as a sub-dimension of SSPEE. Participants' associated their perceived competency in physical skills and abilities by means of comparing themselves to their peers in physical education and by the way they were treated by their physical education teachers. Moreover, PC was often compared to sports and athleticism in physical education. Adults recalled successful SSPEE and high perceived competence when others considered them to be athletic or when they thrived in team sport activities and fitness testing. Consequently, unsuccessful SSPEE had the opposite results. The findings indicate that physical education programs are failing to effectively promote and encourage perceived competence of lifelong physical activity in secondary school students. This supports previous studies that indicate PE is not meeting student needs of developing positive attitudes toward physical activity and promoting a more active lifestyle (Kirk, 2005; Mears, 2007, 2008; Portman, 2003; Trout & Graber, 2009).

Relationship between IM, SSPEE and AATPA

Results of the current study indicated a positive relationship between IM, SSPEE, and AATPA. Thus, more positive IM emotions the more likely adults have positive attitudes towards physical activity in adulthood. This indicated that IM in physical education experiences in secondary school influences adulthood attitudes toward PA.

One participant stated, “PE helped build life lasting team building skills. It also helped develop a lifelong desire to exercise and achieve desirable results through exercise,” and “Positive reinforcement through PE years built confidence in me and pushed me through life.” The present results confirmed earlier findings. Tenenbaum and Eklund, (2007) contends increased IM in PA results in people engaging in PA out of their own choosing and are known to be more intrinsically motivated to conduct PA.

Findings revealed a significant relationship to eight independent variables associated with IM and AATPA; age (two categories), BMI, SSPEE, youth ATPE, years of physical education participation (two categories), and current physical activity. This supports Mata, et al. (2009) findings that weight, current level of activity, and adults 22-50 years of age had a relationship to IM, SSPEE and AATPA. Mata and colleagues contend SSPEE influences future IM for exercise and physical activity for leisure.

Age and BMI were negatively related to IM. The older the respondent was and the greater the BMI, the less intrinsic motivation. Thus, signifying the older and more overweight an adult is the less likely the adult is to have high levels of IM. For instance, a participant commented regarding their weight and influencing factors of motivation:

“Oh no. I am not digging that deeply into buried horrors. I remember continually getting made fun of cause I was bigger than the other kids although I could do anything that they could and I was much more limber than they were. The coaches would also make you feel less than human when they would say ‘are you sure you want to try’ or ‘I think you are too big for this.’”

It is plausible to speculate that negative SSPEE influences adult lifestyle behaviors. Moreover, the need to promote individuals’ intrinsic motivation, improve

instruction about health enhancing physical activity and provide better teaching strategies for all populations especially for students with increased BMI.

Intrinsic motivation (IM) plays a major role in determining behaviors. The lack of IM, hence amotivation, helps, explain the tendencies of over half of adults in this study to report they currently participate in physical activity (i.e., “less than 2 days a week.”). The results of this study indicated that SSPEE influenced IM and participation in physical activity in adulthood. Thus, perhaps adult IM behaviors appear to be influenced by past experiences during youth.

In support of this finding, one participant in the study recalls his favorite physical education memory withdrawing and avoiding physical activity this way: “Being able to sit out, I faked a knee injury and got a medical doctor’s note to sit on the bleachers and watch everyone else make a fool of themselves.” Another participant stated, “The only pleasant memory I have is skipping the class to walk across the street for pizza.” One participant recollected negative experiences as being a key indicator for not wanting to participate in activity. “I used to be verbally sexually harassed every time I went to PE in high school by the same guy so I absolutely hated going. And felt like an animal being shown doing tricks.”

Adults also recounted they did not learn in school the ways to practice health-enhancing physical activity lifestyles and behaviors. Sample comments from respondents included, “My 7-12 PE teachers simply rolled out the ball. As an athlete, I enjoyed this b/c it allowed me to play. From an educational standpoint however, there was little instruction and little emphasis on lifetime applicability.” Another participant stated, “PE was about sports. I was very athletic and did well in volleyball, basketball and softball.

Therefore, I enjoyed PE. I wish I would've learned more about how to stay healthy throughout life, especially when I no longer played sports.”

In response to the lack of learning about the benefits of lifelong physical activity in PE classes, participants' comments included, “PE class seemed to be more about learning the rules of different sports- and WHAT is with FREAKING DODGEBALL, it's not fun at all!!- than learning how to keep healthy habits and learn exercises to do alone. We did yoga once or twice and that is the only thing I've really stuck with.” Another respondent stated, “PE was fun, I like playing the games. But, I didn't learn anything about why exercise was important.”

The majority of written comments about learning health-enhancing lifetime physical activity were directed toward sports or sports skills. Results of this study revealed that learning in PE class did not promote lifelong physical activity and involved a stronger sport-related curriculum. Along with previous results from this study, it is apparent that PE is not meeting the needs of secondary school students to learn and practice a physically active lifestyle.

The present findings support Shen, Wingert, Li, Sun, and Rukavina (2010) and their examination of factors that influences IM in secondary school PE. Their results revealed that high school students lacked different sources of motivation in PE classes, what they called amotivation, leading to reduced IM. Two of the sources included the students' ability beliefs and the value they placed on the activity task. Thus, if students did not perceive that they would be able to achieve success or were not taught the importance of the task, amotivation occurs. Belief in their ability to meet task demands

and the value they placed on the task was two areas in which physical educators can influence IM.

In order for physical educators to make more positive SSPEE, results from this study suggest that educators need to help students find meaning in PE activities and skills as well as teach skills and activities that students perceive as attainable. Respondents from this study commented on the influence of physical education teachers and IM. One respondent stated “Once I got into high school PE was about division and was taught by bio/driver’s ed/football coach or by manly gungho women who weren’t much for teaching or encouragement.” Thus, the use of a new curriculum implemented by PE teachers could increase student motivation.

This is supported by Barkoukis, Tsorbatzoudis and Grouios (2008) who reported in their seven month motivational intervention study that intentional affirming of motivation by teachers had a positive effect on IM in secondary school PE students. Thus, a positive motivational climate by teachers that fosters student interest and increased IM altered self-determination for participation in physical activity. The study also reported the IM intervention increased PC in physical education skills and caused less anxiety-evoking situations especially for those with low ability. The results from this study, and the findings from similar studies (e.g. Lodewyk, Gammage & Sullivan, 2009) suggest that PE teachers should promote students’ IM to foster positive attitudes toward lifelong-physical activity, especially in secondary school PE.

Implications

The ability to predict attitudes toward physical activity based on experiences in secondary school PE is important for the field of physical education and for the health and fitness of secondary school students. The field of PE has an imperative role in decrease rates of obesity in the U.S. The results showed that: (1) SSPEE predicts AATPA, (2) PC to some extent explained the variability of SSPEE and AATPA; and (3) there is a positive relationship between IM, SSPEE, and AATPA.

The results provide ample support for developing curriculum in secondary school PE that will help direct secondary school physical education experiences to become more relevant and meet the demands of students. This study also provides substantial evidence of what is *not working* in secondary school PE programs. It is necessary to examine areas that need improvement in order address and overcome weaknesses in the development and education of university physical education majors, who will carry out the mission of improving the quality of PE classes in school systems. Minimal costs are associated to expanding physical education curricula that offers more lifetime physical activities. Staffing is not an issue since it is not increasing time with students. Offering new activities may result in addition equipment cost however; the cost is minimal compared to the benefits of increasing adult physical activity and costs associated with physical inactivity (CDC, 2009; Finkelstien, Trogon, Cohen & Dietz, 2009).

Perhaps the typical emphasis in sports needs to be reduced, with greater attention devoted to establishing a learning atmosphere that increases IM, PC and develops more positive attitude toward physical activity among secondary school PE programs. Also needed is to develop and carry out a program that addresses the proliferation of

overweight students and those considered “non-athletic.” These non-athletes need far more attention toward building improved fitness, sport-skills, and positive attitudes toward maintaining a more active lifestyle.

This recommendation is supported by Sykes and McPhail (2008), who examined fat phobia which PE teachers humiliated, excluded, or ignored students who were overweight or obese. The researchers contend low-skilled and overweight students are treated differently and more harshly than more skilled or athletic students in PE classes. Thus, types of behaviors by PE teachers cause decreased motivation to participate in physical activity of any kind. Sykes and McPhail assert physical education programs are oppressive and promote fat phobia among students and as a result cause overweight and obese students to avoid physical activities. The results from this study provides ample support for PE teachers; to increase PC and IM, promote more lifetime physical activities, and design curriculum that includes students at all abilities levels.

Results of the present study showed that adults clearly recollect secondary school physical education experiences, intrinsic motivation and perceived competence. It was apparent that attitudes toward PE and physical activity were transparent based on the participants’ 767 non-compulsory written comments in addition to the quantitative results. This information can help members of the fitness industry and physical educators to improve understanding of the needs of students, particularly students with increased BMI.

The study demonstrated that higher BMI was inversely related to decreased IM and PC, and the more negative attitudes toward PA. This study represents the need to design curriculum that meets the needs for all students by increasing lifetime physical

activities and perhaps limiting the traditional sports athletic curriculum. New teaching strategies, new curricula and new approaches to increase student motivation are several techniques that need to be addressed in university teacher education programs as well as in-services for veteran teachers. Perhaps teacher recruitment other than persons who want to coach sports in schools is another strategy to decrease the emphasis on traditional sports and increase lifetime fitness instruction. Recruiting new types of physical education teachers that desire to focus more on fitness such as people with background in corporate fitness, martial arts, and fitness group instruction may prove more successful toward meeting student needs toward a physically active lifestyle.

Limitations

There were selected limitations in this study. The survey used in this study was completed online, which eliminated the respondents with restricted or no computer access. An online study was conducted due to previous studies had been qualitative with smaller sample sizes. In order to maximize the amount of participants and increase generalizability of the population, an online version was used. Nonetheless, an online study was a limitation in the study.

It is possible that limited retrospective recall in the study influenced the statistical outcomes. Participants may have experienced inherent limitations of recalling memories of previous physical education experiences. The study, however, included an attempt to increase retrospective recall accuracy by using target questions that moved in the direction from current to past experiences in order to stimulate the respondent's memory. For instance, current physical activity status was the first items on the survey. The second items asked were previous adolescent experiences and perceptions of them self and

family during 7th through 12th grade. Then SSPEE questions were asked. Moreover, the number of detailed written comments provided by respondents indicated retrospective recall was relatively accurate and consistent with the statistical results. For example, one outcome of the study was that the quality of PE classes was more important to the respondents than the number of years of experiencing PE classes.

Sample bias may have influenced statistical outcomes. The greater amounts of participants were recruited from random businesses and random departments at universities. However, some participants were recruited from an obesity bariatric center and previous secondary school athletes were recruited from sports-related businesses. Based on previous literature and results from the pre-study focus group, this recruitment method was used to ensure a variety of participants were represented in the study. Nonetheless, it is possible sample bias may have occurred.

Another limitation in the present study was the use of a cross-sectional design. Cross-sectional designs only measure a single point in time. However, cross-sectional designs can determine differences between defined groups and subgroups in the study that are representative of changes that take place in larger populations. Group differences that represent larger populations were evident in the present study (e.g. cohort of age index). Cross-sectional designs allowed individuals from various age groups to participate in the study, whereas longitudinal studies follow one age cohort over a period of time. Examining the current research problem to determine predictors of SSPEE, IM, PC and AATPA should include larger sample sizes than was used in the present study.

Future Recommendations

Future studies should examine if adult retrospective recall of experiences in PE classes that included the students perceptions of competence are embedded in the overall SSPEE. If so, it will provide further support that SSPEE has more influence on adult attitudes. Furthermore, future studies may investigate the relationship between PC, AATPA, SSPEE, and BMI on athletes as compared to non-athletes.

An additional consideration for future research is the substantial amount of evidence for embedded types of participants. In this study adult satisfaction with their current level of physical activity resulted in 44.3% ($n = 310$) mostly or completely dissatisfied with their current physical activity habits, whereas 37.3% ($n = 260$) were mostly or completely satisfied with their current physical activity habits. Another example in the study indicated half of participants responded (49.5%, $n = 350$) were not confident in doing skills and activities conducted in physical education classes. Furthermore, 42.3% ($n = 296$) did not believe they learned content during physical education classes, whereas the other half of participants did. Future research investigating the different types of adults (e.g. overweight, unskilled, athletic, fit, etc.) and the relationship between previous secondary school physical education experiences and adult attitudes toward physical activity should be conducted.

Apparently, many participants contended that their experiences in PE class had no value. Along with participants written comments stating there is little value in physical education, data analysis revealed, in areas at times as high as 25% response rate, answered in the neutral or “neither agree or disagree” category. Examining adult and youth indifference or unconcern toward physical education classes may be an implication

of negative or indifferent attitudes toward adult physical activity. Therefore, future research such as intervention research is needed to improve attitudes and value toward PE among high school students.

Positive and negative responses about SSPEE and AATAP were divided. Results indicated a large division of participant groups who strongly agreed and strongly disagreed between positive and negative physical education experiences in secondary school. Participant written responses suggest teacher influence as a factor toward motivation and future PA. A teacher trait study is recommended to help determine the amount and type of influence physical education teachers have on AATPA.

Overall, the results of this study showed a relationship between SSPEE and AATPA. The influence of SSPEE, especially for overweight populations and for participants that spend more years in secondary school physical education plays an important role in AATPA. More often than not, negative SSPEE coupled with low expectations from teachers and students result in negative AATPA. Further research is needed to determine the types of sub-groups are indicative of the type of experiences in secondary school physical education. Smaller qualitative studies indicate athletic participation and body type may influence SSPEE. It is recommended that further study is conducted with large numbers of adults in specific types of groups using the AEQ and ATPE scales in order to substantiate this study's results about SSPEE and AATPA.

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Appendices

Appendix A. Implied Consent

Introduction

You are invited to participate in an online survey conducted by Ph.D. candidate Monica O'Rourke from Middle Tennessee State University. Your participation will help health educators better understand physical education (PE) experiences and adult's current attitudes about physical activity.

Survey responses are CONFIDENTIAL AND ANONYMOUS and cannot be traced to any specific participant. Therefore please be honest and candid in your responses. Your participation is voluntary and you may withdraw at any time without consequence or penalty. If you have questions, please feel free to contact Monica O'Rourke via contact information below or Dr. Mark Anshel via e-mail at manshel@mtsu.edu.

The survey spans multiple pages and will take approximately 10 minutes to complete.

IF YOU ARE UNDER THE AGE 18 OR OVER THE AGE OF 55, please do not complete the survey.

Your participation is vital to the overall success of this study. Thank you so much for your generous help and time.

Monica O'Rourke, Doctoral Candidate
mo2e@mtmail.mtsu.edu

Appendix B. Participant Survey

Current Physical Activity Profile

Select an answer that best describes you.

1. For the purpose of this survey, physical activity includes exercise for fitness (i.e. going to the gym, weight lifting, etc.) and leisure activities (i.e. dirt bike riding, golf, running, biking, etc.). How satisfied are you with your current level of physical activity?

I am

Completely Satisfied	Mostly Satisfied	Neither Satisfied of Dissatisfied	Mostly Dissatisfied	Completely Dissatisfied
☐	☐	☐	☐	☐

2. How many days a week do you exercise for fitness or participate in physical activity for fun? Select from the drop menu below.

Exercise Intensity**3. Exercise/Physical Activity Intensity – How hard do you exercise or participate in physical activity?**

- ☐ Vigorous Intensity
- ☐ Both Moderate to Vigorous
- ☐ Moderate Intensity
- ☐ More Easy to Moderate
- ☐ Easy Intensity

Middle and High School Physical Education Experiences

The following questions ask about your experiences during your middle and high school years. It might help to take a minute and think about the different schools you attended and different people who took care of you during that time (parents, guardian, etc.).

For the purpose of this study middle and high school **BEGINS AT 7th GRADE THROUGH 12th GRADE**. Try your best to think about your entire 7th to 12th grade school physical education (PE) experiences as you answer these questions.

5. While growing up did your PARENTS OR GUARDIANS who you lived with exercise regularly?

- ☐ My parents or guardian exercised regularly
- ☐ My parents or guardian DID NOT exercise regularly.

6. How would you describe yourself during 7th-12th grade? When compared to other students in middle and high school, I was...

- ☐ VERY UNDERWEIGHT
- ☐ UNDERWEIGHT
- ☐ AVERAGE
- ☐ SLIGHTLY OVERWEIGHT
- ☐ OVERWEIGHT
- ☐ VERY OVERWEIGHT

7. During 7th through 12th grade, did you participate in any sports teams? (Any teams run by your school or community).

- ☐ Yes, I participated in a sports team
- ☐ No, I did not participate in a sports team.

Athletic Participation

8. Select the type of sport activities that you participated in during 7th-12th grade?

Select all that apply.

☐ Baseball

☐ Golf

☐ Tennis

☐ Basketball

☐ Gymnastics

☐ Track and Field

☐ Cheerleading

☐ Hockey

☐ Volleyball

☐ Cross Country

☐ Lacrosse

☐ Water Polo

☐ Dance

☐ Soccer

☐ Wrestling

☐ Diving

☐ Softball

☐ Football

☐ Swimming

☐ Other (please specify)

Middle and High School Physical Education Experiences

9. In what state did you live in during 7th through 12 grade? Select from the drop menu.

10. During 7th through 12th grade, how many school years did you participate in PE classes? Only include years of PE class during school hours. Do not include after school athletics. Select from the drop menu below.

Class Related Emotions in Physical Education

11. Attending PE classes during 7th-12th grade can induce different feelings. This part of the questionnaire refers to emotions you may have experienced BEFORE, DURING and AFTER PE class. Before responding to the items on the following pages, recall some specific memories of being in PE class in 7th through 12th grade.

Recall how you felt about going to PE class. Read each item carefully and respond using the scale provided.

BEFORE PE Class...

	Strongly Agree 5	4	3	2	Strongly Disagree 1
I used to get excited about going to PE class	☐	☐	☐	☐	☐
I remember being so nervous I would rather have skipped PE	☐	☐	☐	☐	☐
I used to look forward to learning in PE	☐	☐	☐	☐	☐
I recall it being pointless to go to PE since I could not do the skills and activities	☐	☐	☐	☐	☐
I remember being confident when I went to PE	☐	☐	☐	☐	☐

During Class

12. Think about how you felt DURING physical education (PE) class. Read each item carefully and respond using the scale provided.

DURING PE Class...

	Strongly Agree 5	4	3	2	Strongly Disagree 1
Because I enjoyed PE, I recall wanting to participate	☐	☐	☐	☐	☐
When I did anything in PE I felt like I was making a fool of myself	☐	☐	☐	☐	☐
I recall being confident because I could do the skills and activities	☐	☐	☐	☐	☐
All the useless things I had to do in PE made me irritated	☐	☐	☐	☐	☐
I recall being embarrassed about not being able to do a skill or activity	☐	☐	☐	☐	☐
I used to get angry about the PE teachers' grading standards	☐	☐	☐	☐	☐
I remember being proud that I was better than others	☐	☐	☐	☐	☐
I thought about what else I could have been doing rather than being in PE	☐	☐	☐	☐	☐

After Class

13. Now consider how you felt AFTER physical education (PE) class. Read each item carefully and respond using the scale provided.

AFTER PE Class...

	Strongly Agree 5	4	3	2	Strongly Disagree 1
Reflecting on my accomplishments in PE makes me happy	☐	☐	☐	☐	☐
I was discouraged about the fact that I never learned anything	☐	☐	☐	☐	☐
I can be proud of what I accomplished in PE	☐	☐	☐	☐	☐

14. How satisfied are you with your overall physical education experience?

	Completely Satisfied	Mostly Satisfied	Neither Satisfied of Dissatisfied	Mostly Dissatisfied	Complete Dissatisfied
I am	☐	☐	☐	☐	☐

Physical Education Experience

15. Consider your OVERALL PHYSICAL EDUCATION EXPERIENCE from 7th through 12th grade. Using the scale below, please select the number that best describes you and your CURRENT attitude toward your physical education experience.

7=Corresponds Exactly 6=Corresponds A lot 5=Corresponds Enough 4=Corresponds Moderately 3=Corresponds Little 2=Corresponds Very little 1=Corresponds Not at all

[illegible]

Summary

16. Overall, Physical Education (PE) prepared me for a lifetime of healthful physical activity.

Select one

Strongly Agree	Agree	Moderately	Disagree	Strongly Disagree
☐	☐	☐	☐	☐

Demographics

In order to understand peoples' responses to the previous questions, we need to know a few things about your background.

Remember your responses are completely confidential and no identifying information will be linked to your responses in any way.

17. Gender

☐ Female

☐ Male

18. Do you have a diagnosed medical condition that prevents you from exercising?

☐ Yes

☐ No

19. What is the highest level of education you have completed? Select from the drop menu below.

20. How old are you? Select from the drop menu below.

21. Date of Birth

MM DD YYYY
Birthday / /

22. How tall are you? Select from the drop menu.

23. Weight

lbs

24. How many hours do you work a day?

Hours

25. Annual Income

\$

THANK YOU FOR YOUR PARTICIPATION!

PLEASE FORWARD THE SURVEY LINK TO ANY FRIENDS, FAMILY OR CO-WORKERS THAT WOULD COMPLETE THIS SURVEY

THIS IS THE END OF THE SURVEY THANK YOU FOR PARTICIPATING IN MY STUDY

If you would like to participate in other questionnaires involving this topic, have questions or comments, please feel free to email me at mo2e@mtmail.mtsu.edu or provide your contact information in the comment box below Thank you

Respectfully,
Monica O'Rourke

26. Optional: Describe a POSITIVE memory/experience from 7th through 12th grade PE.

27. Optional: Describe a NEGATIVE memory/experience from 7th through 12th grade PE.

28. Questions? Comments you would like to share? Be reminded the survey is anonymous. If you request a return response please leave your contact information.

Appendix C. Institutional Review Board Approval

November 30, 2010

Monica O'Rourke & Mark Anshel
Department of Health and Human Performance
mo2e@mtmail.mtsu.edu manshel@mtsu.edu

Re: Protocol Title: "Predictors of attitudes toward physical activity as a function of secondary education"
Protocol Number: 11-140

Dear Investigator(s),

I found your study to be exempt from Institutional Review Board (IRB) continued review. The exemption is pursuant to 45 CFR 46.101(b) (2). This is because your study involves the use of survey procedures. Additionally, the data obtained will be recorded in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects and any disclosure of the subjects' responses outside the research could not reasonably place them at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

You will need to submit an end-of-project report to the Office of Compliance upon completion of your research. Complete research means that you have finished collecting data and you are ready to submit your thesis and/or publish your findings. Should you not finish your research within the three (3) year period, you must submit a Progress Report and request a continuation prior to the expiration date. Please allow time for review and requested revisions. Your study expires on **November 30, 2013**.

Any change to the protocol must be submitted to the IRB before implementing this change. According to MTSU Policy, a researcher is defined as anyone who works with data or has contact with participants. Anyone meeting this definition needs to be listed on the protocol and needs to provide a certificate of training to the Office of Compliance. **If you add researchers to an approved project, please forward an updated list of researchers and their certificates of training to the Office of Compliance before they begin to work on the project.** Once your research is completed, please send us a copy of your final report to the Office of Compliance.

Also, all research materials must be retained by the PI or **faculty advisor (if the PI is a student)** for at least three (3) years after study completion. Should you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,

Ashley Grooms

Graduate Assistant to:

Emily Born, Compliance Officer

Middle Tennessee State University IRB

Appendix D. Pre-Notice Letter to University Students (in person)

**MIDDLE
TENNESSEE**
STATE UNIVERSITY

December 2, 2010

Hello. My name is Monica O'Rourke, a Ph.D. student at Middle Tennessee State University (MTSU). I was given permission by the university to contact you and invite you to take part in my dissertation research study for my Ph.D. graduate degree.

Soon you will be receiving an e-mail from me requesting you to participate in a brief online "SurveyMonkey.com" survey for an important research project I am conducting with the Health and Human Performance Department at MTSU.

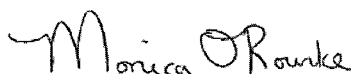
It concerns your current attitudes about physical activity and your middle and high school physical education experiences.

I am writing in advance because I understand that many people like to know ahead of time that they will be contacted. This study is important not only to fulfill my Ph.D. graduation requirement, it is an important one that will help health educators better understand what adults' secondary school physical education experiences were like, their current attitudes about physical activity, and whether physical education met their needs.

Your answers and e-mail are completely confidential and responses are anonymous. Therefore, I encourage you to be very candid in your responses.

Thank you for your time and consideration. It is only with the generous help of people like you that my research can be successful. I encourage you share the e-mailed survey link with friends and family that may want to participate. If you have any questions about this project now or after you receive your e-mail with the survey website link, feel free to call me or my professor at the numbers stated below.

Respectfully,



Monica O'Rourke, Ph.D. Candidate
Middle Tennessee State University
Department of Health and Human Performance
mo2e@mtmail.mtsu.edu • (540) [REDACTED]



Dissertation Chair • Dr. Mark Anshel, Professor
Middle Tennessee State University
Department of Health and Human Performance
manshel@mtsu.edu • (615) [REDACTED]

Your privacy is important. I promises NOT to sell or share your email address.

PLEASE PRINT & WRITE LEGIBLY

Email Address

First Name ONLY (optional)

1

Email Address

First Name ONLY (optional)

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Email Address

First Name ONLY (optional)

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Email Address

First Name ONLY (optional)

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Email Address

First Name ONLY (optional)

5

Email Address

First Name ONLY (optional)

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Email Address

First Name ONLY (optional)

7

Email Address

First Name ONLY (optional)

8

Appendix E. Pre-Notice Letter via Social Media (online)

Social Media Sites (e.g. Facebook, websites, Twitter, blogs, My Space, etc.)

*“Complete an online survey on SurveyMonkey.com about attitudes toward physical activity. SurveyMonkey is a trusted survey site that many companies and universities use to conduct research. The survey is **anonymous, answers are confidential, and responses cannot be traced to any specific person.** It will take approximately 5-10 minutes to complete. The survey posting is available through January 10th. Would you please participate? “*

http://www.surveymonkey.com/s/cto_activity_survey

E-Mail to Businesses

Hello. My name is Monica O'Rourke, a Ph.D. student at Middle Tennessee State University. I was given permission by Centennial Center for the Treatment of Obesity to contact you and invite you to take part in my dissertation research study for my Ph.D. degree.

I am humbly asking if you would complete an online survey on SurveyMonkey.com regarding your current attitude about physical activity and your middle and high school physical education experiences. This study is important not only to fulfill my Ph.D. graduation requirement, it is an important one that will help health educators better understand what adults' secondary school physical education experiences were like, their current attitudes about physical activity, and whether physical education met their needs.

SurveyMonkey is a trusted survey site that many companies and universities use to conduct research. Your answers and e-mail are completely confidential and responses are anonymous and cannot be traced to any specific person. Therefore, I encourage you to be very candid in your responses. It will take approximately 10 minutes to complete. Would you please participate?

Here's the link to the survey. http://www.surveymonkey.com/s/cto_activity_survey

Thank you for your time and consideration. It is only with the generous help of people like you that my research can be successful. I encourage you share the survey link with friends and family that may want to participate.

If you have the time, please complete the survey now. I know it is Christmas season so the last day to complete the survey is January 10. If you have any questions, feel free to call or e-mail me. Thank you in advance.

Respectfully,

Monica O'Rourke, Ph.D. student
Health and Human Performance
Middle Tennessee State University
Email xxxx@mtmail.mtsu.edu
Cell (xxx) xxx-xxxx