

Adolescents' Perceptions of Physical Education and their Leisure-time Physical Activity

by

Nikhil Satchidanand

B.S. State University of New York College at Buffalo 2001

Submitted to the Graduate Faculty of
School of Education in partial fulfillment
of the requirements for the degree of
Master in Science

University of Pittsburgh

2005

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

This thesis was presented

By Nikhil Satchidanand

It was defended on

[March 18th, 2006]

and approved by

Deborah J. Aaron, Ph.D., Associate Professor

Scott Beach, Ph.D. Research Associate

Thesis Director: Jere D. Gallagher, Ph.D. Associate Professor

Copyright © by Nikhil Satchidanand

2006

Adolescents' Perceptions of Physical Education and Their Leisure-time Physical Activity

Nikhil Satchidanand M.S.

University of Pittsburgh 2005

The objective of this research study was to explore the relationship between students' perceptions of their physical education (PE) classes and their level of leisure-time physical activity (PA). Three psychosocial constructs (enjoyment, self-efficacy, and social support) were examined in the context of physical education. Past research indicates that these constructs influence participation in leisure-time PA. This study attempted to characterize the influence that PE has on leisure-time PA. This study had two objectives. The first was to understand the relationship between PE and leisure-time PA. Secondly, the relationships among enjoyment, self-efficacy, and social support were examined in order to explore enjoyment as a mediator between both self-efficacy and enjoyment and social support and enjoyment, in the context of PE and leisure-time physical activity. Males and females between 13 and 18 years of age ($n = 663$) were surveyed in their PE classes by trained volunteers. Enjoyment, self-efficacy and social support were examined using a questionnaire that was developed for this study. Physical activity was assessed using a summer-time PA inventory, from which median minutes per day of PA were calculated for each participant. The results of independent samples t-tests indicate that males reported significantly higher scores on the enjoyment assessment than females, and a significantly higher number of median minutes per day of PA compared to females. Among white students, self-efficacy scores were significantly higher than within the minority sub-group. Results also indicate that 12th graders reported higher scores on the social support assessment than did all remaining grade-levels. Weak to moderate correlations were found among the psychosocial constructs. Results of the regression analyses show that none of the possible covariates were significant predictors of participation in leisure-time PA. Enjoyment was not a mediator between self-efficacy and total PA, and social support and total PA. The sub-group that reported the highest enjoyment scores also reported the most minutes of total PA (males). However, the exact relationship between PE and participation in leisure-time PA is still unclear. Complex factors contribute to peoples' adoption and long term maintenance of PA. Enjoyment,

social support, and self-efficacy do not exist independent from one another. Rather, they seem to influence each other. The exact nature of this influence is not fully understood. Future research is still necessary to better understand the complex relationships that were examined.

TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
1.1 STATEMENT OF THE PROBLEM.....	2
1.2 RESEARCH HYPOTHESES.....	3
1.3 EDUCATIONAL SIGNIFICANCE.....	4
2.0 REVIEW OF RELATED LITERATURE.....	6
2.1 THEORETICAL AND CONCEPTUAL FRAMEWORK.....	6
2.2 ENJOYMENT, SOCIAL SUPPORT, AND SELF-EFFICACY.....	11
2.2.1 Enjoyment of Physical Activity	11
2.2.2 Social Support in Physical Activity	14
2.2.3 Self-efficacy in Physical Activity	15
2.3 PHYSICAL ACTIVITY LEVELS DECLINE WITH AGE	18
2.4 THE IMPORTANCE OF PHYSICAL EDUCATION	20
3.0 METHODS	23
3.1 PARTICIPANTS	23
3.2 MEASUREMENT	24
3.2.1 Students' Perceptions	24
3.2.2 Summer-time Physical Activity	26
3.3 DATA COLLECTION	28
3.4 SCORING THE STUDENTS' PERCEPTIONS QUESTIONNAIRE	29
3.5 DATA ANALYSIS	31
4.0 RESULTS	34
4.1 NON-REPOSE	36
4.2 TOTAL PHYSICAL ACTIVITY	37

4.3 ENJOYMENT	38
4.4 SOCIAL SUPPORT	40
4.5 SELF-EFFICACY	41
4.6 CORRELATIONS AMONG THE PSYCHOSOCIAL CONSTRUCTS	41
4.7 CORRLATIONS BETWEEN THE PSYCHOSOCIAL CONSTRUCTS AND PHYSICAL ACTIVITY.....	42
4.8 RELATIONSHIPS BETWEEN DEMOGRAPHIC AND PSYCHOSOCIAL VARIABLES AND PHYSICAL ACTIVITY.....	43
5.0 DISCUSSION.....	44
6.0 CONCLUSIONS.....	48
Appendix.....	50
Bibliography.....	68

LIST OF TABLES

Table 1.0 Distribution of Participants by Gender, Race, and Grade-Level.....	35
Table 2.0 Comparison of Enjoyment Scores by Grade-Level.....	38
Table 3.0 Comparison of Social Support Scores by Grade Level.....	40
Table 4.0 Pearson’s Correlations among Enjoyment, Social Support, and Self-efficacy.....	41
Table 5.0 Pearson’s Correlations between Total Physical Activity and Enjoyment, Social Support and Self- Efficacy.....	42

LIST OF FIGURES

Figure 1.0 The Youth Physical Activity Promotion Model	10
Figure 2.0 Median Minutes of Daily Total Physical Activity by Gender	38

1.0 INTRODUCTION

The primary goal of physical education (PE) is to foster an appreciation for physical activity (PA) that transcends the physical education environment. It is hoped that this appreciation will result in an increased level of overall participation in PA among young people that is sustainable. Many physical educators view this as the most important facet of their jobs {1, 2}. The primary objective of this investigation was to examine the extent to which this tenet holds true. In other words, does PE in schools increase leisure-time PA outside of the physical education curriculum? Specifically, by examining psychosocial constructs that influence participation in overall PA, within the context of physical education, a better understanding of the relationship between PE and leisure-time physical activity will be developed. Research indicates that three constructs appear to influence participation in PA. They are enjoyment, social support, and self-efficacy {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}. The current research attempts to expand the knowledge-base by examining these constructs within the context of physical education in order to understand their influence on participation in leisure-time PA.

The PE curriculum provides a potentially powerful vehicle to increase participation in non-school-time physical activity (PA) since most young people attend school. PE has the greatest potential to reach the highest number of youngsters in a highly modifiable environment {13, 14}. Harnessing the power of physical education to increase overall PA and promote

health, is especially critical today, given the sharply increasing prevalence of disease associated with sedentary lifestyle among children and adolescents.

1.1 STATEMENT OF THE PROBLEM

Research indicates that physical activity (PA) is an integral component to a healthy lifestyle at all ages. According to the United States Department of Health and Human Services, regular participation in moderate PA reduces the risk of developing or dying from some of the leading causes of mortality in the United States {8, 15, 16}. These include but are not limited to cardiovascular disease, hypertension, type 2 diabetes and obesity. In the United States, 13.5 million people live with coronary artery disease, while 1.5 million people suffer a myocardial infarction each year. Eight million Americans live with type 2 diabetes, and greater than 60 million Americans (1/3 of the population) struggle with overweight or obesity {8, 15, 16}.

It is clear that maintaining regular PA throughout life is an essential health behavior. However, research indicates that perhaps the most consistent finding is that physical activity declines with age. From childhood through adolescence and into adulthood, there is a significant decline in regular participation in PA. In addition, sedentary behaviors such as television viewing, video game playing, and use of personal computers seem to contribute to the problem of physical inactivity. Longitudinal research indicates that physical inactivity tracks over time. Children who are largely inactive will remain so through adolescence and adulthood. Researchers believe that steps must be taken to “untrack” physical inactivity among young people as early as possible {17, 18, 19 20, 21, 22}.

The exact relationship between PA and sedentary behaviors is not yet fully understood. Some research indicates that reducing sedentary behaviors may be a way to

increase time spent in physical activity. However, television viewing, as one sedentary behavior, has not proven to be a strong predictor of PA in observational cohort studies, and reducing sedentary behaviors has not increased level of physical activity, among healthy adolescents {17, 18, 19, 20, 21, 22}. Still other research indicates that PA and sedentary behaviors are distinct from one another. It may therefore prove more beneficial to promote PA rather than attempt to reduce time spent in sedentary behaviors {20}. The physical education curriculum may then be useful in promoting PA among children and adolescents.

The purpose of this research is to determine if a link exists between psychosocial constructs (enjoyment, self-efficacy, and social support) in the physical education curriculum, and participation in leisure-time physical activity.

1.2 RESEARCH HYPOTHESES

The primary research hypothesis was that within this sample, there exists a strong, positive correlation between each of the psychosocial constructs (enjoyment, social support, and self-efficacy) and participation in leisure-time physical activity. In other words, participants who reported the highest levels of enjoyment, social support, and self-efficacy within physical education, were hypothesized to report the highest levels of actual participation in leisure-time physical activity (PA).

The secondary research hypothesis was that both self efficacy and social support do not directly influence participation in PA. Rather, they serve to enhance enjoyment of physical education (PE). Enjoyment of PE in turn functions as a mediator between social support and participation, and self-efficacy and participation. Simply, students who perceive that they are

good at PE activities, and perceived that they are supported by their physical educator, parents, and peers, are more likely to enjoy PE. This enjoyment of PE will then lead to increased participation in leisure-time physical activity.

1.3 EDUCATIONAL SIGNIFICANCE

The primary goal of PE is to foster an appreciation of physical activity that endures far beyond the PE curriculum. It is critical to understand the exact aspects of PE that accomplish this goal. This research can provide an understanding of three specific psychosocial constructs that influence participation in PA. These constructs (enjoyment, self-efficacy, social support) are being investigated within the PE curriculum. Some research indicates that attitude toward PE has an influence on the adoption and maintenance of PA in the long-term {9, 10}. As Thom McKenzie wrote...

“By engaging children and adolescents in enjoyable physical activity and teaching them the behavioral skills related to developing and maintaining appropriate physical activity, future generations of adults could be aided from becoming sedentary.” (pg. 225) {11}.

This statement embodies the true goal of PE. If enjoyment, social support, and self-efficacy within the context of PE have an influence on participation in leisure-time PE programming must be specifically designed to enhance these three psychosocial constructs. Should this research help to prove that enjoyment, social support, and self-efficacy in physical

education do truly inspire young people to maintain PA outside of PE, we must strive to create curricula that are diverse, offering children many opportunities to participate in enjoyable and engaging activities. Diverse experiences allow many more children to excel and perceive high levels self-efficacy in their activities. Finally, educators must create atmospheres in which peer criticism and ridicule are simply not tolerated. Educators must also be aware of the power that they possess over a child's future participation in PA and ultimately over their health {12, 13, 14}.

2.0 REVIEW OF RELATED LITERATURE

The purpose of this investigation was to examine the relationship between physical education (PE) and participation in leisure-time physical activity (PA) among high school students. Central to the current research are three specific psychosocial constructs that appear to influence participation in PA. They are enjoyment, social support, and self-efficacy. These constructs were examined in relation to students' experiences in their PE classes. The following section addresses the theoretical and conceptual framework of this research, followed by research on enjoyment, social support, and self-efficacy in physical activity. In addition, this section provides information on the decline in physical activity in the high school population, and finally provides a better understanding of the important role that physical education has on encouraging physical activity.

2.1 THEORETICAL AND CONCEPTUAL FRAMEWORK

The Youth Physical Activity Promotion Model (YPAPM) served as the theoretical foundation for this research. It is a conceptual model that utilizes a social-ecological framework, recognizing that PA participation is influenced by various personal, social, and environmental factors. It is a synthesis of different constructs from competing theoretical frameworks, which provides a multidimensional explanation of participation in PA among young people {4}.

The organizational structure of the YPAPM follows the Precede-Proceed Model for health promotion planning (Green & Kreuter 1991). This model was created to guide development of various health education programs with the objective of targeting a variety of health behaviors. An advantage of this model is that it employs a “Bottom-up” approach in which a specific population’s characteristics and needs are fully determined prior to program development {4}. The Precede-Proceed model also accepts differing theoretical perspectives, understanding that a multitude of factors influence a person’s behaviors. One theoretical perspective may offer more effective intervention targets than another {4}.

The preliminary stage of the Precede-Proceed model for health promotion planning is Behavioral and Social Diagnosis. The objective of this stage is to identify common determinants of physical activity among young people. Various issues however, complicate this aspect of the research. Firstly, accurate assessment of PA among young people is challenging. Recall may be limited and young people often exhibit activity patterns that are more sporadic and more challenging to predict {4}. The focus of this preliminary stage is to present an accurate picture of the pre-existing conditions that influence PA habits among young people. The ultimate foci of the remaining stages and ultimately the intervention effort itself are profoundly affected by the information acquired during this initial stage {4}.

For the current research, three specific constructs are being examined in relation to students’ participation in leisure-time PA. They are enjoyment, social support and self-efficacy. The following text explains in detail, the origin of each of these constructs as well as their interrelationships within the Youth Physical Activity Promotion Model (YPAPM) {4}.

The first construct being examined within the YPAPM, is enjoyment of physical activity (PA). Enjoyment is integral to Intrinsic Motivation Theory. Intrinsic Motivation Theory

attempts to explain the motivating nature created by enjoyable experiences {26}. Within the YPAPM, enjoyment of PA is a predisposing factor that serves to answer the question, “Is it worth it?”. By answering this question, we can fully identify the costs and benefits associated with participating in PA in both cognitive and affective realms {4}. Enjoyment of PA is an affective component that is investigated by the YPAPM. Predisposing factors are variables that collectively increase the likelihood that a person will maintain a behavior. The current research is an investigation of enjoyment of physical education (PE) activities as an influence on leisure-time PA {4}.

The second construct being examined is self-efficacy. Self-Efficacy Theory (Bandura 1986) was born of social learning theory and social cognitive theory, which contend that activity behaviors are primarily influenced by the interaction between a person’s attitude, social norms, and surrounding influences. Essential to self-efficacy is self-evaluation, in which a person perceives the degree of control that they have over their own behaviors {23, 24}. Simply, self-efficacy in PA asks the question, “Am I capable of performing this physical task?” In order to answer this question, a person must evaluate their assets and liabilities that are associated with performing the task. Within the Youth Physical Activity Promotion Model (YPAPM), self-efficacy can be found under the “Am I able” heading. This construct is also a predisposing factor in the Precede-Proceed Model {52}. Specific to this research, self-efficacy in performing physical education activities is being investigated.

The third and final construct being studied is social support. This construct involves assessing the quality of a person’s social network and its influence on physical activity (PA) habits. Within the YPAPM, this construct can be seen under the Reinforcing Factors heading {4}. These are variables that support a child’s PA behaviors. In this model, reinforcing factors

directly and indirectly. The direct effect for example, can be observed when parents facilitate their child's participation, (e.g., driving to sports practices, pursuing active family activities). The indirect effect originates from forces that shape a child's predisposition to PA. For example, in some instances children exhibit the same beliefs systems regarding the importance of PA as their parents. In some research parents that value PA, fostered a greater appreciation for it among their children. For the current project, three potential sources of social support are studied. They are parents/caregivers, physical education teacher, and peers {4}.

The Youth Physical Activity Promotion Model provides a multidimensional explanation of the complex factors that motivate children to be physically active. Each construct; enjoyment, self-efficacy, and social support are contained within the model. There relationships with one another and physical activity are explained therein. Figure 1.0 is a visual representation of the Youth Physical Activity Promotion Model.

2.2 ENJOYMENT, SOCIAL SUPPORT, AND SELF-EFFICACY

Research indicates that certain psychosocial constructs exert an influence on physical activity (PA) participation. Paramount to this research are three constructs; self-efficacy, social support, and enjoyment. The following section provides the scientific basis for examination of these constructs within the context of the physical education (PE) curriculum.

2.2.1 Enjoyment of Physical Education

Past research indicates that enjoyment of physical activity (PA) is significantly associated with participation in leisure-time physical activity with higher levels of enjoyment being related to increased levels of participant. The past research that was investigated included enjoyment as a component of Intrinsic Motivation Theory. It examined enjoyment among elementary school students along with physiological and performance-based markers. In addition, enjoyment was investigated comparing two differing motivational climates and their influence on participation in PA, as well as intention to be physically active. Finally, enjoyment was examined in relation to resistance to participating in physical education activities among female high-school PE students.

When reviewing enjoyment of PA, motivational climate and resistance to activity are significant. In 2003, Prochaska et al. performed a three-year prospective study on 414 male and female elementary school children (PE). The cornerstone of this research was intrinsic motivation theory, a model with which to conceptualize the motivating nature of enjoyable experiences {12}. Change in PE enjoyment was examined by gender, ethnicity, and participation in organized sports {12}. PE enjoyment was assessed using the question, “How do you feel about PE classes?” Response options were six sad/happy faces from a frowning face

(coded 1) to a smiling face (coded 6). This assessment technique provided both strength and direction of PE enjoyment {12}. In addition to PE enjoyment, a mile-run test and BMI measurements were conducted to assess cardiorespiratory fitness and adiposity, respectively. A Pearson Product Correlation Coefficient of - 0.27 reflects a negative correlation between BMI and mile-run time. Greater PE enjoyment was associated with faster performance on the mile-run test. In addition, overall enjoyment of PE decreased linearly, from 90 percent to 78 percent of maximum. With this decrease came a decrease in sports participation and an increase in adiposity. The results of this study show that decreases in PE enjoyment among these elementary school students was associated with decreased physical performance, decreased sports participation, and increasing adiposity {12}. In order to completely understand enjoyment of PA, understanding motivational climate is critical. In 2001, Escarti and Gutierrez examined the effects of the motivational climate of PE on students' motivation, interest, and intention to practice PE activities or sports, based on achievement goal theory {26}. Enjoyment of physical education activities was included as one dimension of intrinsic motivation. In a sample of 975 males and females with a mean age of 15.25 years, intrinsic motivation was assessed using the Intrinsic Motivation Inventory. This assessment includes four subscales; (1) interest-enjoyment (2) perceived competence (3) effort-importance and (4) tension-pressure. Students' enjoyment/interest in physical education activities was explored in relation to two distinct motivational climates; the mastery climate and the competitive climate {26}. In the Escarti and Gutierrez study, students who perceived a mastery climate reported higher levels of enjoyment of PE, higher levels of interest in physical activity for the pleasure the activity provided, and lower levels of boredom. They also reported higher levels of intention to participate in PA in the future. In contrast, when students perceived a climate of competition, less enjoyment was

reported with higher levels of pressure. In addition, subjects in the competitive motivational climate reported lower levels of intention to participate in PA in the future {26}. Results from this study also indicate that enjoyment is an integral component of curriculum design if it is to successfully foster an enduring appreciation for PE.

Related to motivational climate is resistance to physical activity. In a 2002 investigation of adolescent girls' experiences in PE, Olafson examined resistance to PE using a Foucauldian and feminist framework {27}. Much of Foucault's work has been in the exploration of the complex relationships between resistance and power. Within the grade-school context, the power relationships among administrators, teachers, and students give rise to various forms of resistance. According to Foucault, this resistance is inevitable when relationships of power exist {27}. Olafson focused on adolescent girls' PE enjoyment in relation to level of resistance and techniques used to avoid participation in high school PE. It is possible that in some instances, a major institutional barrier to participation in PE is the curriculum itself, emerging as a powerful predictor of resistance to participation. Enjoyment of PE activities directly affected level of resistance and avoidance of physical education. Anecdotal information indicates that many subjects enjoyed being PA outside of their physical education classes. However, the majority of subjects found PE activities uninteresting and disengaging {27}. These young women were most likely to practice resistance and avoidance techniques such as feigning illness, intentionally leaving active-wear at home, having parents write excuse notes, or skipping class. One such young woman relayed her feelings that the activities in her PE class were boring and repetitive. When forced to participate in such activities she was most likely to skip class or feign illness {27}. These feelings and avoidance techniques were all too common among the subjects. This study also reinforces the idea that PE enjoyment has an effect on participation levels among

high-school aged subjects. Young women, who did not enjoy their PE classes, were most likely to harbor feelings of resistance and employ numerous tactics to avoid participation. The results of this research show the extreme importance of enjoyable activities in promoting an appreciation of PA throughout life. Based upon the studies described in this section, enjoyment does have a significant influence on participation in physical education (PE) activities. The following section provides evidence of the importance of social support in promoting physical activity.

2.2.2 Social Support

In addition to enjoyment, students' perceptions of their social support are also being examined. In a 2003 study by Portman investigating the experiences of ninth graders in their last semester of required PE, asked the question, "Are physical education classes encouraging students to be physically active?" In order to do so, high-skilled and low-skilled students were individually interviewed for 40 minutes {28}. One dimension of PE that was a significant indicator of associated attitudes was social support. All subjects liked having friends as partners or teammates, irrespective of skill level. High-skilled students looked for partners with the same level of skill and competitiveness to challenge each other. Low-skilled students looked to their partners as a source of support and a non-critical ally {28}. This sheds light on a very significant influence on attitudes toward PE, and ultimately participation levels as well. Low-skilled students reported frequent episodes of criticism and belittling from peers and embarrassment when attempting new skills or any skills in which they felt less proficient. High-skilled students in contrast, cited very few occurrences of belittling while performing physical activities. Furthermore, this embarrassment and awkwardness so powerfully paralyzed some low-skilled students that many reported that they did not intend to participate in voluntary PA in the near

future {28}. Furthermore, low-skilled students, who reported frequent cases of belittling and ridicule, had the lowest levels of leisure-time PA in the entire sample {28}. Children simply will not attempt physical activities if the price is constant belittling and criticism. To sum up the feelings of many low-skilled students, “Why should we continue to do something that we are not good in and people yell at us if we make a mistake? I just don’t need that.” {28}.

In another research study investigating the role of social support as an influence on PA involved two different samples; one, a biracial sample of middle-class male and female teachers (mean age = 38.5 +/- 8.9 years) and one, a biracial sample of lower- to middle-class males and females (mean age = 35.8 +/- 5.1 years). In both samples, social support for exercise positively correlated with PA. In addition, regardless of employment status and race, women's overall activity, particularly during leisure time, was positively related to family support {29}. Regardless of social class, white women's overall PA levels, especially sports and leisure participation were positively associated with friend support. Additionally, whether lower or middle class, black women's sports activity was positively related to family support. Finally, among white males in both samples, sports activities and total energy expenditure were positively related to family and friend support {29}. These research studies indicate that social support among various populations does influence participation in PA.

2.2.3 Self-efficacy

Some research indicates that self-efficacy has an influence on PA participation. Self-efficacy affects some of the factors that predict motivation. According to Bandura, self-efficacy is an evaluation of one's ability to perform a task. However, high self-efficacy in one domain does not necessarily transfer to other areas of endeavor. High self-efficacy positively affects performance;

this good performance will increase self-efficacy {23, 24}. Also according to Bandura, four phenomena influence self-efficacy. They are mastery experiences, vicarious experiences, verbal persuasion, and physiological state. Mastery relates to one's personal experiences with success and failure. Vicarious experience is related to observing the experiences of others. Observation of a successful "model" is likely to enhance self-efficacy in the individual. Verbal persuasion encompasses encouraging the individual to perform the task at hand or convincing him or her that they can achieve success in performing the task. Conversely, negative messages or discouragement have been found to be even more influential than positive messages {23, 24}. Finally, physiological state relates to anxiety, nervousness, sweating, or a rapid heart-rate that may occur when a learner is attempting to meet a challenge. Such physiological responses can have a tremendous impact on ability to learn or perform new tasks {23, 24}.

In a 2001 investigation of psychosocial correlates of PA among healthy children, self-efficacy was measured via questionnaire. This questionnaire provided three distinct methods with which to measure self-efficacy. Results indicate that all 3 measures of self-efficacy were significantly correlated with high activity. Overall, children with increased levels of self-efficacy were more likely to have increased levels of high activity in comparison to children with low levels of self-efficacy (odds ratio, 4.07; 95% confidence interval, 1.03-16.30). Multivariate regression analysis found that age, sex, and self-efficacy were significant independent correlates of high activity ($r^2 = 0.29$, $P < .001$), with around 10% of the variance in high activity explained by self-efficacy scores, {30}. In another investigation among children, positive correlations (0.27 and 0.33) were found between both moderate and vigorous physical activity, and self-efficacy for boys and girls respectively, {30}. A central result of this present study was the significant association between physical activity self-efficacy and objectively measured PA behavior. With

the exception of moderate PA in the male subjects, physical activity self-efficacy was the strongest independent predictor of daily participation in both moderate and vigorous PA {30}.

Another study demonstrating the influence that self-efficacy has on PA levels involved 6th and 8th grade female students. The main goal of the study was to investigate the validity of a measure of self-management strategies for PA by testing whether it mediated the relationship between self-efficacy and PA, independently of selected social-cognitive variables (i.e., perceived barriers, outcome expectancy value, and enjoyment), among two samples of adolescent girls differing in age {31}. The intention was to demonstrate that irrespective of other social-cognitive variables, self-efficacy exerts an influence on PA among female adolescents. Two findings of the study that have not been previously demonstrated for PA, are consistent with Self-efficacy Theory. In this study, the association between self-efficacy and PA was mediated by self-management strategies among 8th grade girls. The association of self-efficacy with PA was indirect, mediated by self-management strategies and perceived barriers. This study found that although self-efficacy did not directly influence PA, this relationship was mediated by the use of self-management strategies and barriers. Interventions may prove effective if they build self-efficacy for PA by employing self-management strategies. This study helps to support the power that self-efficacy has on participation in PA, whether direct or indirect {31}. Self-efficacy has been highly correlated with PA in some research studies. Past research indicates that self-efficacy does influence participation in physical activity in some populations. The following section provides detailed information regarding the decline in physical activity level that is experienced with increasing age.

2.3 PHYSICAL ACTIVITY LEVELS DECLINE WITH AGE

The inverse relationship between age and physical activity (PA) is among the most consistent findings in physical activity epidemiology. From childhood through adolescence, as human beings age, their participation in PA declines {32}. According to research involving subjects between 12 and 75 years, adolescence is the period experiencing the greatest decline in PA. The Amsterdam Growth and Health Study found adolescents between 12 and 15 years, experienced the sharpest decline in PA, even greater than that of adults {32}. For the entire study period of 15 years, there was an observable decline in time spent in PA, exceeding the 4-MET level. In addition, total PA expressed in METs·wk⁻¹, also declined. These results were observed in both male and female subjects. In addition, both time spent in physical activity greater than 4-METS, as well as total PA, declined during this same age range. After approximately age 16, the rate of decline of the weighted activity score appeared to slow {32}. In this study, from age 13 until subjects were adults at age 27, the amount and nature of habitual PA was assessed by means of an interviewer-administered 3-month recall. Continuing to follow the same group of subjects over a 15 year period strengthens the results that PA participation does in fact decline with increasing age {32}.

A longitudinal study performed in Finland reveals similar results to those found in the previous study. A significant decline in frequency of PA was found after age 12 in both males and females. Among males, this decline continued until age 27. The percentage decline in frequency of activity (at least twice a week) per year was at its highest, 8.8% in males and 4.7% in females, both between 12 to 15 years {33}. Self-reported PA declined from age 12 to 27, frequency of PA declined by 57% among male subjects and 28% among females, and moderate

or vigorous PA declined by 55% among males and 20% among females. This decline was shown by all the questionnaire measurements of activity except intensity which appeared to increase with declining age in this sample {33}. Kimm et al. also discovered a sharp decline in PA during the transition from childhood to adolescence. The data are from The National Heart Lung and Blood Institute (NHLBI) Growth and Health Study (NGHS); a prospective study which tracked 2379 black and white females for a 10-year period. Subjects began the study at 9-10 years of age. After the 10-year follow-up period subjects' daily activity had declined by 35%, at 18-19 years of age. In addition, the level of habitual activity declined by 83% {34}. Kimm et al. supported these findings in a study involving 782 adolescents between 12 and 15 years of age at baseline, with a reduction in PA as they transitioned to adolescence. During the 4-year study period, PA declined by 26%. These researchers found that this decline was due to a decrease in the number of activities in which the subjects participated from childhood into adolescence {34}.

A four-year longitudinal study performed by Aaron et al. reinforces the realization that physical activity declines with age. The physical activity of 782 male and female students (aged 12 – 15 years) was measured annually using a questionnaire, collecting data on hours per week of PA, number of activities reported, and participation in a list of specific activities (Yes or No) {35}. Aaron et al. discovered a 26 percent decline in physical activity during the four years. In addition, the probability of not participating in a specific activity during the study period was very high and consistent for both males and females, 0.70 to 1.00. This decline in physical activity was attributed to a decrease in the number of activities in which adolescents were engaging. Additionally, there is only a moderate probability that the adolescent will continue participating in an activity from junior to senior high {35}.

The aforementioned longitudinal research indicates that as children mature, there is a marked decline in their participation in PA. The purpose of this research was to examine the PE curriculum as an influence on participation in leisure-time PA. The following section provides an understanding of the relationship between physical education and physical activity.

2.4 THE IMPORTANCE OF PHYSICAL EDUCATION

PE in schools is a potentially powerful tool with which to combat the decline in physical activity childhood through adolescence. One of the primary goals of PE is to promote physical activity that transcends the school environment. PA during the school day has the potential to develop positive exercise behaviors in children, and participation in such activity could lead to young people becoming more physically active outside of school. Ultimately, this appreciation for PA may remain as adolescents become adults {36}.

Multidimensional reasons exist in support of the power of PE to promote leisure-time physical activity and ultimately lifelong PA. Research indicates that PA behavior patterns are established early in young people's lives {37}. Since all children are required to attend school, most people experience school for long periods of their lives and for much of their waking hours. The PE curriculum within schools provides the last structured opportunity to reach the full range of individuals within a given population, in a highly modifiable environment. Furthermore, school-based PA provides a variety opportunity for young people to be active through recess/play-breaks, physical education programming, and extracurricular sports and activity programs. Extracurricular sports and physical activity programs are of particular interest because they offer children and adolescents an opportunity to choose to participate. This

introduces young people to the idea of incorporating PA into their lives on largely their own terms. However, the school-based nature of extracurricular sports and PA programs provides much needed structure. It is anticipated that as young people enter adulthood, an established choice to participate in after school PA will lead to a choice to participate in after-work PA {36}. In addition, once they leave their educational environments, young people's opportunities to be physically active simply decline. The structure of the average work-day does not naturally provide opportunities to be physically active. Schools have the final responsibility of shaping young people's decision-making processes within the context of health-related behaviors {36}.

“Beyond this age the audience is no longer captive and choices about activity are at the mercy of myth, early experiences, peer pressure, and the sophistication of understanding and expertise of the young person.” {37}.

Despite elevated academic standards and shrinking school budgets, research indicates that PE remains an integral component to the healthy development of children and adolescents. Perhaps more important, both parents and teacher recognize the importance of physical education. The Robert Wood Johnson Foundation's national polls revealed that 88% of parents and 97% of teachers believed that PE curricula should remain within education, despite budgetary concerns. In addition Brownson, Baker, Housemann, Brennan, and Bacak found that 95.2% of adults in the U.S. regardless of gender and income agree with the need for required PE in schools {39}.

PE is a unique vehicle that must be utilized to its utmost potential in the attempt to increase PA among young people. It is therefore critical that we understand the specific

attributes of physical education that truly exert an influence on PA outside of the school environment. This research addresses the relationships among enjoyment, self-efficacy, and social support in the context of the physical education curriculum.

3.0 METHODS

The main purpose of this research study was to investigate the influence that three specific psychosocial constructs within physical education (PE), have on participation in leisure-time physical activity (PA) among high school students. The three constructs being examined within the context of physical education are enjoyment, self-efficacy and social support. Secondary is an examination of the interrelationships that may exist among enjoyment, self-efficacy, and social support.

3.1 PARTICIPANTS

Eligible study participants included all male and female PE students at the target school. Students exempt from PE due to physical disabilities or other considerations were not asked to participate in this research. The target school was a public high school in a predominantly white (97%), middle to upper class village. The median family income in the year 2004 was \$42,252. The total population of students at the target high school is 1396. The ninth grade contained 348 students, the tenth grade had 327 students, the 11th contained 354 students, and the 12th grade had 367 students. The age range of participants was between 13 years of age and 18 years of age.

3.2 MEASUREMENT

The current research study is a survey-based census of all of the PE students at the target high school. Central to this research is the use of two survey questionnaires: one to assess psychosocial constructs (enjoyment, social support, and self-efficacy), the other to measure levels of leisure-time PA within the study population. The following sections provide a detailed description of each of the survey questionnaires.

3.2.1 Students' Perceptions

Research indicates that certain psychosocial constructs influence participation in PA. These include but are not limited to enjoyment, self-efficacy, and social support. The foundation of this survey questionnaire was based upon an examination of these constructs within the context of the PA experiences of high school students. It is critical to state that this survey questionnaire examined perceived competence in addition to enjoyment, self-efficacy, and social support. However, due to a lack of conceptual differentiation between perceived competence and self-efficacy, perceived competence will not be reported. In addition, due to the overwhelmingly homogeneous racial composition of this study population, racial differences were not investigated.

This survey questionnaire was developed for this research study. It contains 32-items using both Likert-scale type questions with four response options, and scale questions with one and nine as anchors. This selection of question formats allows investigation of both direction and strength of responses. The 32-items are divided into five sections. Sections one through four investigate enjoyment, self-efficacy, perceived competence, and social support. The fifth

and final section asks participants some questions regarding demographic information such as age and gender.

The objective of this research study was to examine each of the psychosocial constructs within the context of PE to determine their influence on leisure-time PA among the participants. The development of this survey questionnaire was guided by specific research questions being thoroughly investigated. First, in order to understand the PE curriculum's effectiveness in enhancing these psychosocial constructs, it was important to examine the levels of each of the constructs (enjoyment, self-efficacy, and social support). Self-reported low levels would potentially indicate room for improvement within the PE curriculum or perhaps a necessary shift in teaching focus. Therefore, each individual construct was measured by the survey questionnaire.

Second, it was critical to describe the interrelationships that may exist among enjoyment, self-efficacy, and social support. In other words, do these constructs have any effect on one another? As one hypothesis previously explained, it was considered that both self-efficacy and social support do not directly enhance participation in physical activity. Rather, self-efficacy and social support are mediated by the presence of enjoyment. It is this enhanced enjoyment that directly influences participation. Simply, if participants believe that they are proficient in PE activities, they will enjoy them more. As a result, they will report higher levels of actual participation. This is another research question that guided the development of this assessment instrument.

Finally, it is important to understand differences in reported levels of enjoyment, self-efficacy, and social support according to demographic characteristics such as gender and age. For example, are there significant differences in the levels of the three constructs, reported by

male participants versus female participants, or among the four different grade levels? This research objective will help to identify differences in the perceptions of students within the context of physical education, who demonstrate demographic variability.

This newly developed survey questionnaire serves as an assessment instrument designed to collect data about participants' PE experiences. The following section provides a detailed description of the Summer-time Physical Activity Inventory for High School.

3.2.2 Summer-time Physical Activity

In order to assess participants' physical activity (PA) levels, a past summertime assessment instrument was utilized. This assessment was developed specifically for this research project, based upon an Epidemiologic Questionnaire to Assess Past Year Physical Activity in Adolescents, adapted from research work performed by Aaron et al. {35}. The Summertime Physical Activity Inventory for High School consists of three sections. Each section specifically explores students' participation in common sports and physical activities during non-school hours. This assessment instrument does not measure PA that takes place during school hours such as physical education activities. However, it does assess school-sponsored sports and activities as long as they occur after school.

The format of the questionnaire follows the format of the original chart-based assessment form. The original assessment was intended to be an interview, which allowed for more control over the interview process by the interviewer. For enhanced clarity and readability of the new self-administered instrument, the activities and sports were clustered into smaller groups by intensity level. MET values guided the formation of the groups; 1-3 METS = Low, 4-7 METS = Moderate, and above 7 = High. Additionally, participants are more likely to

concentrate on each individual item on the list, when the overall length of the list is smaller, rather than trying to skim quickly in order to save time. This tactic was used to diminish the possibility of participant-related error that is common in self-report studies {29}. In addition, this grouping allow for analysis by intensity level as well as total amount of PA.

To assess frequency and duration of the common physical activities and sports within the various lists, days per week of participation and minutes per day of participation were also requested for each activity or sport checked. For each sport or activity in which a subject participated during the months of June, July and August, the student was to place a check-mark in the box marked “YES”. For activities never participated in, “NO” was to be checked. Then following from left to right, the student was to check each month in which he or she participated in the sport or activity. In addition, the student was asked to fill in the average number of days per week and average number of minutes per session that they engaged in the particular sport or activity. These columns serve to measure frequency and duration of time spent in a particular sport or activity. This method was continued through the three charts until the entire questionnaire was completed. It is important to understand that this exact assessment, utilized in this way, was newly developed to be used in this project. Therefore, no data regarding reliability and validity exist. The aforementioned survey questionnaires were administered to participants at the target high school. The following section provides an understanding of the detailed data collection procedures employed in this research study.

3.3 DATA COLLECTION

Data were collected during participants' physical education (PE) classes. Physical education at the target school is on an every-other-day schedule. Therefore, it was necessary to collect data on two consecutive days in order to survey all eligible students. Data was collected on a Tuesday and a Wednesday in early October, 2004. Due to the nature of this study, informed consent was waived. The research protocol and all of its dimensions were approved by the University of Pittsburgh's Institutional Review Board (IRB).

Survey administration was performed by two teams of volunteers. A female team surveyed all female PE students, while a male team surveyed all male PE students. Same-gender teams were utilized to limit associated bias as well as to ease physical access through each of the locker/changing rooms. Female students were surveyed in one gymnasium while, simultaneously males were surveyed in another gymnasium. It is important to note that while the PE teachers were present during survey administration, they were asked not to interact with the participants while completing the surveys. It is against school policy to allow uncertified personnel to oversee students in a school environment. Therefore, the PE staff was required to be present.

For each PE class, as soon as all students were seated, survey administration began with a standard script of instructions read aloud. Time for questions or concerns was provided before each participant was given a survey packet and a number 2 pencil. Participants were then asked to carefully read the printed instructions on the front cover of the survey packet. If no questions or concerns arose, the participants were asked to begin completing the questionnaires.

Upon completion of the survey questionnaire packets, students were asked to raise their hands. A team member then collected the survey materials from finished students.

Students who submitted their complete survey packets were then dismissed. After all surveys for the entire day were completed, for both males and females, the principal investigator collected all survey packets. One issue of great importance in survey-based research is that of non-response. The following section provides detailed information on the procedures used to score the perceptions questionnaire.

3.4 SCORING THE STUDENTS' PERCEPTIONS QUESTIONNAIRE

This assessment instrument provides two distinct methods to measure each of the three psychosocial constructs (enjoyment, self-efficacy, and social support). The Total score for each construct is obtained by adding the scores from each of the first seven questions of each section. Possible point values range from one to four points, corresponding with Strongly Disagree, Disagree, Agree, and Strongly Agree. This questionnaire contains both positive questions for which "Strongly Agree" earns 4 points, and negative questions for which the same response earns only one point. Prior to data analysis, the scores were reversed on those scores that indicated a negative connotation for health related behaviors. Examples of the scoring method follow:

Positive Question: Physical Education is my favorite class

1) Strongly Agree 2) Agree 3) Disagree 4) Strongly Disagree

<u>Response</u>	<u>Points Earned</u>
Strongly Agree	4 points
Agree	3 points
Disagree	2 points
Strongly Disagree	1 point

Negative Question: The activities and sports we do in my Physical education class are repetitive.

1) Strongly Agree 2) Agree 3) Disagree 4) Strongly Disagree

<u>Response</u>	<u>Points Earned</u>
Strongly Agree	1 point
Agree	2 points
Disagree	3 points
Strongly Disagree	4 points

The higher the score within each section, the higher the level of the specific construct.

The highest possible score within each section, assuming all items are answered equals 28 points.

The lowest possible score equals 7 points.

The second method of assessment is a Scale question for each of the three constructs, with one and nine as anchors. The number one corresponds with the lowest level of each of the constructs, while the number nine corresponds with the highest level. Point values for each scale

question correspond directly with the response number. An example of a Scale Question follows.

Example of Scale Question:

Please rate your overall level of Enjoyment of your Physical Education Class.

1	2	3	4	5	6	7	8	9
Do not enjoy							Enjoy a lot	

3.5 DATA ANALYSIS

Steps were first taken to prepare the data for analyses. First, outliers and anomalous data were re-examined for accuracy. Total minutes of physical activity were calculated for each participant across the three-month survey period. In order to obtain a measurement of total minutes of physical activity per week, this number was divided by 12 (12 weeks in 3 months). A measurement of Total Physical Activity (TPA) per day was then derived by dividing the resultant number by 7 (7 days in 1 week). This process was performed for each of the three intensities (low, moderate, and high). Finally TPA per day was obtained by summing Low, Moderate, and High intensity physical activity minutes per day. This provided a measurement of the total number of minutes per day engaged in physical activity. Upon completion of this calculation, it was discovered that four male participants reported more TPA than possible, given the constraints of a 24-hour day. Therefore, these participants were excluded from all data analyses. Second, the race category was dichotomized, in which the four non-white race sub-groups were collapsed into one group, labeled Minority. The second race sub-group was labeled White. This was performed to account for the fact that the racial distribution was skewed, with an overwhelming majority of students belonging to the White race sub-group. Additionally, scores

on the first 7 items of each section of the perceptions questionnaire were summed for each of the psychosocial constructs, in order to calculate a reliability score.

The distribution of Total Physical Activity (TPA) was found to be severely skewed. Attempts to normalize the data through a transformation were performed. The square root of Total Physical Activity was calculated (SQRT (TPA)). The data regarding the three psychosocial constructs were also normalized using the same transformation. It is therefore important to understand that the descriptive statistics reported in the following section are median values before the transformations were performed. All relationships among the variables were examined using the transformed data.

Median minutes per day of Total Physical Activity (TPA) were calculated for each participant. In addition, Chronbach's alphas were calculated among the first 7 items of each section in order to determine the extent to which each section forms a scale. For both TPA and scores on the psychosocial constructs, the following statistical procedures were utilized to make comparisons among the different groups. Again, all statistical comparisons were performed using the normalized data. Gender and race comparisons were performed using Independent Samples t-tests. Grade-level and age comparisons were performed using Analysis of Variance (ANOVA). Relationships among the three psychosocial constructs were examined using Pearson's Correlations. Additionally, Pearson's Correlations were calculated between TPA and each of the three psychosocial constructs. Regression analysis was performed to examine the relationships among all possible covariates and TPA. Specifically, regression analysis was performed to examine the secondary hypothesis developed for this research. It was hypothesized that enjoyment of PE would act as a mediator between both social support and TPA, and self-

efficacy and TPA. These distinct relationships were investigated using regression analysis. All data analyses were performed using Statistical Package for the Social Sciences (SPSS)

Version 13.0.

4.0 RESULTS

The study population was 52 percent female and 48 percent male with 65 percent belonging to the White sub-group. The total number of respondents equaled 663. Ninth grade students made up 22 percent of the population, 29 percent were in the tenth grade, and 24 percent were in both the 11th grade and 12th grade. Participants refusing to respond to the race question equaled 19 percent and 1 percent of participants (6 participants) did not respond to the grade-level question. Table 1.0 provides the distribution of participants by gender, race, and grade-level. The median minutes of Total Physical Activity (TPA) for the entire population equaled 54.30 minutes per day. The median scores on the Scale Assessments for Enjoyment, Social Support, and Self-efficacy were 5 points, 4 points, and 3 points respectively (range for each construct = 1 – 9), within the entire study population.

Results of the Cronbach's alpha calculations among the first 7 items of each section indicate that these items do not form a scale. The Cronbach's alpha calculations for Enjoyment, Social Support, and Self-efficacy equaled .112, .374, and .250, respectively. Thus, this assessment of the psychosocial constructs was not used in any future analyses due to the extremely low Chronbach's alphas. The Scale Assessment of the psychosocial constructs at the end of each section provided the only data on enjoyment, social support, and self-efficacy within the physical education environment.

Table 1.0: Distribution of Participants by Gender, Race, and Grade-Level

Sub-group		Number of Participants	Percentage
Gender	Male	319	48%
	Female	344	52%
Race	Minority	109	17%
	White	429	65%
Grade-Level	9 th	145	22%
	10 th	188	29%
	11 th	158	24%
	12 th	158	24%

4.1 Non-response

This research study is a census of all physical education (PE) students at the target high school. As such, a sampling strategy was not necessary. However, error due to non-response is of great concern when performing survey-questionnaire based research. Concern arises in developing the best surveying strategy to capture the greatest number of students. Although all PE classes were surveyed, it is highly improbable that all PE students completed the questionnaire packets and submitted them to the research teams. The question which must be asked is; how representative of all students at the target school, are the students who completed and submitted the questionnaire packets? Furthermore, would significant viewpoints from students be lost, if certain students did not complete questionnaire packets?

There are a number of reasons why certain students would not complete and submit questionnaire packets. Certain students may have knowingly “skipped” PE class in an attempt to avoid participation. Additionally, some students may have been legitimately absent due to illness or other considerations. Apart from physical absence, some students may have refused to complete the questionnaires, for a variety of reasons from simple boredom to attempting to exhibit defiance. If fewer students, who do not favor PE, complete the questionnaires, results would not be representative of students who attend the target high school. Unfavorable responses to the questionnaires would be lost because these students would not have completed the questionnaires at all. A higher percentage of students would then appear to favor PE than is accurate within this population.

Additionally, some students may have felt more inclined to complete the questionnaires than others. Students who perceived themselves as active may complete the

questionnaire more willingly, believing that they will look more favorable than less active students. Students who are interested in the subject matter may also be more willing to complete the questionnaire packet. If a higher percentage of students, who favor physical education, complete the questionnaires, the results would not be representative of the entire population at the target high school.

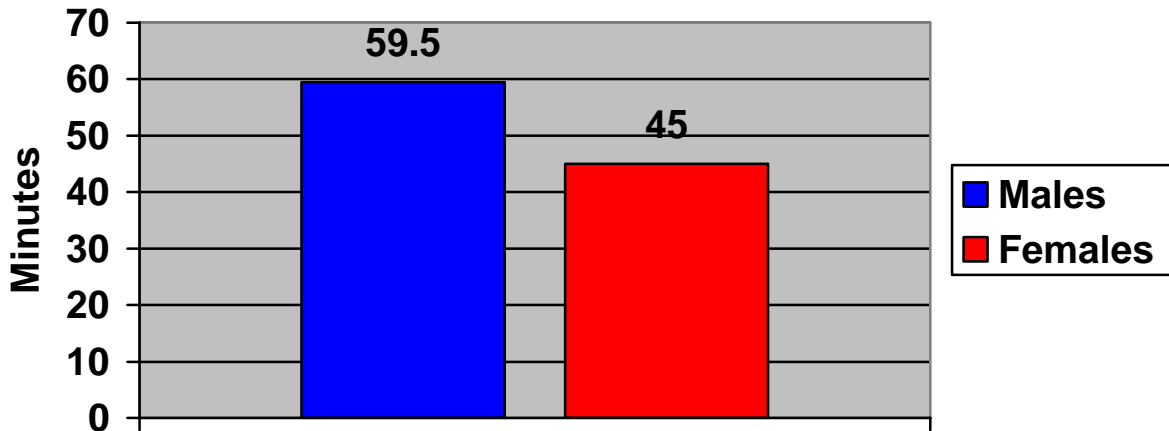
The overall response rate for this population equaled 47.5 percent. This was obtained by dividing the total number of completed surveys by the total population of the school (663 / 1396). Non-response took the form of absenteeism, refusals, and incomplete surveys. There were 186 incomplete surveys (128 males and 58 females) that were not included in analysis. An incomplete survey was defined as being less than 50% complete. In addition, 12 male students and zero female students refused to complete the surveys. Unfortunately data regarding absenteeism was not available to the researcher. In addition, the sample demographics for the entire school were not made available to the researcher. Therefore non-response bias could not be estimated.

4.2 Total Physical Activity

The median value for TPA among males equaled 59.50 minutes per day, and 45.00 minutes per day among females. Comparison of the normalized data using an Independent Samples t-test indicates that males reported significantly more TPA than females, ($t = 2.699$, $df = 559$, $p = .007$). The median TPA among minority students equaled 52.40 minutes per day. Among white students median TPA equaled 52.90 minutes per day. Results of an Independent Samples t-test show that no statistically significant differences were found between minority students and white

students in minutes of TPA reported. Figure 1.0 indicates that males reported significantly higher median minutes of TPA than females.

Figure 2.0: Median Minutes of Daily Total Physical Activity (TPA) by Gender



The median values for Total Physical Activity (TPA) among 9th, 10th, 11th, and 12th graders equaled 60.50, 53.80, 55.90, and 44.80 minutes per day, respectively. Results of a One-Way Analysis of Variance (ANOVA) of the normalized data indicate that no statistically significant differences were discovered among the four grade-levels with respect to minutes of TPA reported.

4.3 Enjoyment

The median scores on the Scale Assessment of Enjoyment were 6.00 points and 5.00 points for males and females, respectively (range: 1 – 9). Results from the analysis of the normalized data indicate that a statistically significant difference in enjoyment scores exists between males and females, with males reporting a higher level of enjoyment of physical education than females, ($t = 5.653$, $df = 594$, $p = .000$). The median scores on Enjoyment equaled 5.00 points for both

minorities and whites (range: 1 – 9). Additionally, the median scores among the four grade-levels on the enjoyment assessment equaled 5.00 points for 9th, 10th and 11th graders. Grade 12 students reported a median score of 6.00 points (ranges: 1 – 9 for all grade levels). Statistically significant differences were discovered among the four grade levels, (F = 2.985, df = 3, p = .031), with 12 grade students reporting a significantly higher score on the Scale Assessment of Enjoyment than 10th grade students, (t = 2.943, df = 321, p = .017). Table 2.0 indicates that significant differences exist among the four grade levels, when the normalized data were used.

Table 2.0: Comparison of Enjoyment Scores by Grade-Level

Grade Level	Grade-Level	*Mean Diff.	Standard Error	P-Value
9	10	2.94	3.02	.764
	11	-.73	3.17	.996
	12	-5.60	3.10	.264
10	9	-2.94	3.02	.764
	11	-3.68	3.00	.608
	12	-8.55	2.90	.017
11	9	.73	3.20	.996
	10	3.68	3.00	.608
	12	-4.87	3.05	.379
12	9	5.60	3.10	.264
	10	8.55	2.90	.017
	11	4.87	3.05	.379

Mean Difference is significant at the $p \leq .05$ level

* Normalized data used to compare differences in enjoyment scores by grade level

4.4 Social Support

The median scores on the Scale Assessment of Social Support equaled 4.00 points for both males and females (range:1 – 9) Minority students reported a median score of 4.00 points on the Scale Assessment of Social Support, while white participants reported a median score of 5.00 points (range: 1 -9). No statistically significant differences were discovered between minority participants and white participants in social support scores. The median scores on social support equaled 4.00, 4.00, 5.00, and 6.00 points among 9th, 10th, 11th, and 12th graders, respectively (range: 1 -9).

Table 3.0: Comparison of Social Support Scores by Grade-Level

Grade Level	Grade-Level	*Mean Diff.	Standard Error	P-value
9	10	2.10	3.03	.900
	11	-.44	3.18	.999
	12	- 8.71	3.11	.027
10	9	- 2.10	3.03	.900
	11	- 2.55	2.99	.829
	12	- 10.81	2.90	.001
11	9	.44	3.18	.999
	10	2.55	2.99	.829
	12	- 8.27	3.06	.035
12	9	8.71	3.11	.027
	10	10.81	2.90	.001
	11	8.27	3.06	.036

mean difference is significant at the $p \leq .05$ level

* Normalized data used to compare differences in social support scores by grade-level

4.5 Self-efficacy

The median scores on the self-efficacy assessment were 3.00 points and 4.00 points for males and females, respectively (range: 1 – 9).. Results of an Independent Samples t-test of the normalized data indicate that the difference in the median scores on the self-efficacy assessment between males and females is not statistically significant. Self-efficacy for minority students white students were 3.00 and 4.00 points, respectively (range: 1 – 9) . Results indicate that white students reported significantly higher scores on the self-efficacy assessment than minority students, ($t = 5.085$, $df = 470$, $p = .000$). Median self-efficacy scores among the grade-levels were 3.00 points for 9th and 10th graders, and 4.00 points for 11th and 12th grade students (range: 1 – 9). Results of the analysis of the normalized data indicate that no statistically significant differences exist among the four grade levels regarding their self-efficacy scores.

4.6 Correlations among the Psychosocial Constructs

Pearson's Correlations among enjoyment, social support, and self-efficacy were calculated. Results indicate that weak to moderate positive correlations were found among all of the relationships. Table 4.0 presents the Pearson's Correlations for the entire sample.

Table 4.0: Pearson’s Correlations among Enjoyment, Social Support, and Self-efficacy

	<u>Pearson R:</u>	<u>p-value</u>
Enjoyment – Social Support	.503**	.000
Enjoyment – Self-efficacy	.285**	.000
Social Support – Self-efficacy	.502**	.000

** Correlation is significant at the $p \leq 0.01$ level

4.7 Correlations among the Psychosocial Constructs and Physical Activity

Results of the Pearson’s Correlation calculations among the three psychosocial constructs and Total Physical Activity (TPA) indicate that no statistically significant correlations were discovered between any of the psychosocial constructs and TPA. Table 5.0 presents the Pearson’s Correlations between TPA and enjoyment, social support, and self-efficacy.

Table 5.0: Pearson’s Correlations between Total Physical Activity and Enjoyment, Social Support, and Self-efficacy

	Pearson’s Correlation	Sig.
Total Physical Activity – Enjoyment	.077	.085
Total Physical Activity – Social Support	.045	.318
Total Physical Activity – Self-efficacy	- .013	.777

** Correlation is significant and the $p \leq .05$ level

4.8 Relationship between Demographic and Psychosocial Variables and Physical Activity

Results of the regression analyses between each of the demographic variables (gender, race, age, and grade level) and Total Physical Activity (TPA) indicate that none of the demographic variables was a significant predictor of TPA. Similar results were discovered between TPA and each of the psychosocial constructs. When regression analysis was performed, none of the psychosocial constructs proved to be a significant predictor of Total Physical Activity. The exploration of Enjoyment as a mediator between both Self-efficacy and TPA, and Social Support and TPA yielded similar results. The results of the regression analysis between Social Support and TPA, and Self-efficacy and TPA were non-significant (Beta = - .320, $t = - .484$, $p = .629$, Beta = - .003, $t = - .048$, $p = .962$ respectively). When Enjoyment was added to the regression models, non-significant relationships remained, ($p = .504$). Enjoyment of physical education did

not prove to be a mediator between Self-efficacy and Total Physical Activity, and Social Support and TPA.

5. DISCUSSION

The primary objective of this research was to explore the relationship between physical education (PE) and leisure time physical activity (PA). Specifically, three constructs in PE were examined in order to understand their influence on participation in physical activity outside of the PE environment. This research utilized a multidimensional survey questionnaire to explore enjoyment, self-efficacy, and social support within the context of PE. This instrument was newly developed for this study and was designed to provide both the strength and direction of the relationships being examined. Demographic variables (grade-level, age, gender, and race) were also examined in order to identify any differences that may exist within this sample. In order to examine level of physical activity, an extensive inventory of physical activities was created. Although not exhaustive, this 3-month (summer-time) inventory provided the vast majority of popular school-sponsored physical activities and sports for the participants to choose from. The use of a 3-month time frame allowed for examination of an extended period of time without introducing excessive recall bias that would be present in a 1-year recall period. Another advantage of this survey technique was the timing of administration. Early October was chosen due to its proximity to the summer break, in order to attempt to limit recall bias. Early September was preferred, however due to the busy schedule associated with beginning a new academic year, the principal investigator was not allowed access to the subjects until early October. Another benefit of the physical activity inventory is the ability to easily derive frequency and duration of the physical activities and sports. Mean and median minutes per day of physical activity were easily calculated.

Consistent with past research, male participants reported a higher level of physical activity than did females {33}. No statistically significant differences in physical activity were discovered between whites and minorities. However, the majority of students (65%) self-identified as white. It is possible that with a more equal racial distribution, minority students may have reported less physical activity than white students. Similarly, among all subjects a statistically significant decline in physical activity was not observed from grade nine to grade 12. However, when comparing only 9th grade and 12th grade students, the data indicate that there appears to be a decline in total physical activity. Grade 9 students reported 60.50 median minutes per day of physical activity, while grades 12 students only reported 44.80 minutes per day. There appears to be a trend of decreasing physical activity with increasing age, although it is not statistically significant. It is expected that physical activity (PA) levels would decline from age 14 to age 18 {17, 18, 22, 33, 34}. It is possible that the sample size was not large enough to capture a significant decline in PA. In addition, this was not a longitudinal study therefore the decline was masked in individual differences.

The level of enjoyment among males was found to be significantly higher than females. Based upon informal observation, anecdotally, this may be partially explained by the starkly contrasting teaching styles and objectives exhibited by the male and female physical education teachers. Male physical educators focused almost entirely on sport-play and competition and it appeared that male students were given more freedom to choose activities. On the surface this appeared to be beneficial. However, it is critical to note that male physical education classes were less organized than the females' classes. More time was spent trying to control male students and in the selection of sports and activities. Less time was perhaps available to actually participate in the activities. Therefore, although there was more choice,

sometimes the lack of structure created confusion and squandered essential time. Female classes focused equally on sports and competition as well as on health-related fitness activities. Female physical educators appeared to be more concerned with teaching their students activities that could be sustained throughout life. More importance seemed to be placed on health and the maintenance of physical function over time. For example, female students learned effective stretching techniques, Pilates, yoga, as well as resistance training. Female students were also given the opportunity to play conventional sports such as soccer and tennis. Female classes were more structured with less idle time and confusion. Students knew what was expected of them when they entered the gymnasium or playing field.

The weak to moderate correlations observed among enjoyment, social support, and self-efficacy indicate that these constructs do not seem to exist independent of one another. Rather, they seem to influence one another in some way. However, due to the correlational nature of this research, the exact cause and effect relationships could not be explored. The correlations observed between the three psychosocial constructs and total physical activity were expected to be significant, with higher levels of each of the constructs correlating with higher levels of total physical activity. However, this significance simply was not discovered. It is likely that the newly developed psychosocial questionnaire did not accurately assess enjoyment, social support, and self-efficacy. This would significantly alter the results of the correlation calculations. The psychosocial questionnaire simply needs further revision if it is to be used in research. The very low Cronbach's alphas indicate that this instrument does not form a useable scale. It is likely that use of this flawed instrument contributed to the lack of significant findings. It is also highly likely that multidimensional factors work together to influence participation in PA among adolescents, some of which were perhaps not examined by this questionnaire. Based

upon the results of the regression analyses, to test for mediation of social support and self-efficacy by enjoyment, other unknown relationships may exist among these constructs. It is then reasonable to believe that the theory being tested has flaws that must be addressed. For the current research, the Scale Assessment of each construct was the only assessment available. The relatively limited information gathered by the questionnaire indicates that the results of this research must be interpreted with caution.

The hypotheses being tested were 1) Strong, positive correlations will exist between each of the psychosocial constructs and level of Total Physical Activity (TPA) and 2) Enjoyment is a mediator between both social support and physical activity and self-efficacy and physical activity. The primary hypothesis was rejected. Based upon the data, it is clear that within this sample, other factors influence participation in leisure-time physical activity. Secondly, enjoyment was not found to be a mediator. This hypothesis also must be rejected. Although statistical significance was not found to support these hypotheses, it is important to note that the sub-group that reported the highest level of Total Physical Activity also reported the highest score on the Enjoyment Assessment. This is limited evidence that perhaps with a more accurate questionnaire, a significant relationship between enjoyment and participation in leisure-time physical activity may be discovered. This finding warrants future research in order to better understand the true nature of this relationship. The next section provides some conclusions and recommendations for future research.

6.0 CONCLUSIONS

Empirically, when given more freedom and choice, participants exhibited more enjoyment of physical education and higher levels of total physical activity per day. However, statistically significant associations were not found. Gender differences do appear to exist in the level of total physical activity and enjoyment, with males reporting more physical activity and higher scores on the enjoyment assessment.

Barriers must be also addressed when performing survey-based research among young people in their physical education environments. It is critical that the survey instrument be developed to accurately assess what is intended. It is highly recommended that the instruments used be thoroughly tested within different populations prior to use in any research studies. In addition, surveying young people in their school environments can be challenging. It is critical that the investigator have the support of the physical education staff, in controlling and organizing the students being surveyed. It may have proven beneficial to offer students incentives to complete the assessment instruments being used. Perhaps this would have increased the level of participation and number of questionnaires completed. Additionally, a limited number of male students reported more physical activity than is physically possible given the constraints of approximately 12 hours of waking time each day. This may point to the possibility that more students, male and female, may have either exaggerated time spent in physical activity, or were unable to accurately recall time spent performing certain activities. This is an important limitation of survey-based, recall research.

Future research may strive to focus upon use of objective measures of physical activity such as accelerometers and activity monitors. This may prove beneficial when assessing activity that is often transient and changing, in this population. However, current limitations remain the prohibitive cost and logistical problems of large-scale, long-term use of such devices. In addition, compliance to research protocols may be limited within this age group. Another direction may be to attempt to derive a more cause/effect relationship among these constructs and level of physical activity. Longitudinal research may be better able to discover relationships that cannot be uncovered with correlational work. Other factors not examined by the current research must also be investigated. The current study was performed among a predominantly white, middle to upper-class sample. Similar research must then be conducted within populations that may differ in socio-economic status, race, and age. It is critical that we better understand the factors that influence all people to participate in and maintain adequate amounts of physical activity.

It is recommended that physical educators strive to provide a variety of activities and allow students some level of choice in selecting activities. This would likely enhance enjoyment of physical education. However, structure is a critical element in learning. Therefore, a balance must be sought if true learning is to take place.

Appendix

Adolescents' Perceptions of Physical Education and their Leisure-time Physical Activity

You are being asked to participate in a master's thesis research project conducted by Mr. Nikhil Satchidanand, in conjunction with the University of Pittsburgh's School of Education. This research project has been developed to study your perceptions of your experiences in your physical education class. Please understand that participation in this survey is voluntary and you may choose not to participate at any time. However, if you choose to assist me, your participation will be greatly appreciated and valued. In addition, this survey is completely anonymous and no names, personal or sensitive information will be recorded. Finally, your grades will not be affected in any way, by your decision to participate or not.

If you choose to participate, here are a few guidelines to assist you.

- 1) Please be honest when responding to the statements and questions. There is absolutely no way for me to connect your survey to your name after they have been collected.
- 2) Please take your time and read each question or statement carefully.
- 3) If you have any questions or concerns about filling out this survey, please feel free to speak to me about them.
- 4) After you have completed the survey, please raise your hand and someone will collect the survey from you.
- 5) This survey will take about 25 minutes to complete.

If there are no questions or concerns at this point, please turn the page and read the instructions for Section 1.

Thank you for your time and cooperation.

Section 1: Enjoyment of Physical Education

* Please fill in the circle on the SCANTRON SHEET that goes with the number that best describes your feelings about each of the following statements or questions.

1) My physical education class is my favorite class.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

2) When I am in my physical education class, I wish I were somewhere else.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly Disagree

3) Please choose the statement that best describes your excitement to participate in your physical education class.

1- I am always excited to get to my physical education class.

2- I sometimes look forward to my physical education class.

3- I do not care if I have physical education class or not.

4- I never want to go to my physical education class.

4) The activities and sports in my physical education class are repetitive.

1- Strongly agree 2-Agree Disagree 4- Strongly disagree

5) Please choose the statement that best describes your enjoyment of your physical education activities and sports.

1- I always enjoy the activities and sports in my physical education class.

2- I sometimes enjoy the activities and sports in my physical education class.

3- I have no opinion about the activities and sports in my physical education class.

4- I never enjoy the activities and sports in my physical education class.

Section 2: Social Support for Participation in Physical Education

© Please fill in the circle on the SCANTRON SHEET that goes with the number that best describes your feelings about each of the following statements or questions.

1) I have many friends in my physical education class.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

2) My classmates make fun of me when I try to do activities and sports in my physical education class.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

3) My parent(s) of guardian(s) think that my physical education class is important.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

4) My parent(s) or guardian(s) make fun of me when I try to be physically active.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

5) My physical education teacher encourages me to participate in my physical education activities and sports.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

6) My physical education teacher tries to prevent students from picking on each other during physical education class.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

7) I am intimidated by my physical education teacher

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

Section 3: Self-efficacy in performing physical education activities and sports

1) I feel clumsy and awkward when trying the activities and sports in my physical education class.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

2) The activities and sports in my physical education class are too difficult for me.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

3) I am able to meet new challenges in my physical education class.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

4) I often feel overwhelmed and out of control in my physical education class.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

5) I am capable of becoming better at my physical education activities and sports if I practice.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

6) The activities and sports in my physical education class are easy for me.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

7) I am able to perform the activities and sports we do in my physical education class.

1- Strongly agree 2- Agree 3- Disagree 4- Strongly disagree

8) On a scale between 1 and 10, please rate your overall ability to perform the activities and sports in your physical education class.

1 2 3 4 5 6 7 8 9

Very Low level of ability

Very high level of ability

You have reached the end of this section. Please turn the page and begin Section 4.

Section 5: Demographic Information

1) What is your current age in years?

- (1) 13 (2) 14 (3) 15 (4) 16 (5) 17 (6) 18 (7) 19

2) What is your gender?

- (1) Male (2) Female

3) What is your current grade level?

- (1) 9 (2) 10 (3) 11 (4) 12

4) What is your racial/ethnic background?

- (1) Black/African American
(2) Asian/Pacific Islander
(3) Hispanic/Latino
(4) Native American/Alaskan Native
(5) White

**After you have completed this questionnaire, please turn the page
and begin the physical activity inventory.**

Summer-time Physical Activity Inventory for High School

- 1) For each physical activity or sport that you participated in during **JUNE, JULY, and/or AUGUST in the YEAR 2004**, place an X in the box marked YES.

- 2) For each physical activity or sport that you marked YES, place an X in each of the months that you participated in that physical activity or sport.

- 3) Next, for each physical activity or sport that you marked YES, write in about how many days each week you participated in that activity or sport, in the **AVERAGE DAYS/WEEK** column.

- 4) For each physical activity or sport that you marked YES, write in about how many minutes each day you participated in that activity or sport, in the **AVERAGE MINUTES/DAY** column.

- 5) Finally, if you did not participate in a particular physical activity or sport, mark the **NO** box and leave the rest of that row blank.

**IF THERE ARE NO QUESTIONS AT THIS TIME, PLEASE TURN
THE PAGE AND BEGIN SECTION 1.**

Section 1

<u>YES</u>	<u>NO</u>	<u>ACTIVITY</u>	<u>J</u> <u>U</u> <u>N</u> <u>E</u>	<u>J</u> <u>U</u> <u>L</u> <u>Y</u>	<u>A</u> <u>U</u> <u>G</u>	<u>Average</u> <u>Days/Week</u> <u>(Frequency)</u>	<u>Average</u> <u>Minutes/Day</u> <u>(Duration)</u>
		Football					
		Volleyball					
		Yoga					
		Pilates					
		Bicycling					
		Weightlifting					
		Rollerblading					
		Skateboarding					
		Water skiing/ wake-boarding					
		Surfing					
		Tennis					
		Squash					
		Racquetball					
		Handball					

Please turn page

Section 2

<u>YES</u>	<u>NO</u>	<u>ACTIVITY</u>	<u>J</u> <u>U</u> <u>N</u> <u>E</u>	<u>J</u> <u>U</u> <u>L</u> <u>Y</u>	<u>A</u> <u>U</u> <u>G</u>	<u>Average</u> <u>Days/Week</u> <u>(Frequency)</u>	<u>Average</u> <u>Minutes/Day</u> <u>(Duration)</u>
		Baseball					
		Softball					
		Bowling					
		Billiards/Pool					
		Golf					
		Walking					
		Table-tennis					
		Badminton					
		Practicing Musical Instrument					

Please turn page

Section 3

<u>YES</u>	<u>NO</u>	<u>ACTIVITY</u>	<u>J</u> <u>U</u> <u>N</u> <u>E</u>	<u>J</u> <u>U</u> <u>L</u> <u>Y</u>	<u>A</u> <u>U</u> <u>G</u>	<u>Average</u> <u>Days/Week</u> <u>(Frequency)</u>	<u>Average</u> <u>Minutes/Day</u> <u>(Duration)</u>
		Hockey					
		Basketball					
		Martial Arts					
		Lacrosse					
		Cross Country					
		Wrestling (Competitive)					
		Jogging					
		Soccer					
		Aerobics					
		Backpacking					
		Rock-climbing					
		Repelling					
		Rowing/Crew					

Congratulations! You have finished this questionnaire and your role in this research project.

Please raise your hand and someone will collect all of your papers.

Tables and Figures

Table 1.0: Distribution of Participants by Gender, Race, and Grade-Level

Sub-group		Number of Participants	Percentage
Gender	Male	319	48%
	Female	344	52%
Race	Minority	109	17%
	White	429	65%
Grade-Level	9 th	145	22%
	10 th	188	29%
	11 th	158	24%
	12 th	158	24%

Table 2.0: Comparison of Enjoyment Scores by Grade-Level

Grade Level	Grade-Level	*Mean Diff.	Standard Error	P-Value
9	10	2.94	3.02	.764
	11	- .73	3.17	.996
	12	- 5.60	3.10	.264
10	9	- 2.94	3.02	.764
	11	- 3.68	3.00	.608
	13	- 8.55	2.90	.017
11	9	.73	3.20	.996
	10	3.68	3.00	.608
	12	- 4.87	3.05	.379
12	9	5.60	3.10	.264
	10	8.55	2.90	.017
	11	4.87	3.05	.379

Mean Difference is significant at the $p \leq .05$ level

* Normalized data used to compare differences in enjoyment scores by grade level

Table 3.0: Comparison of Social Support Scores by Grade-Level

Grade Level	Grade-Level	*Mean Diff.	Standard Error	P-value
9	10	2.10	3.03	.900
	11	- .44	3.18	.999
	12	- 8.71	3.11	.027
10	9	- 2.10	3.03	.900
	11	- 2.55	2.99	.829
	12	- 10.81	2.90	.001
11	9	.44	3.18	.999
	10	2.55	2.99	.829
	12	- 8.27	3.06	.035
12	9	8.71	3.11	.027
	10	10.81	2.90	.001
	11	8.27	3.06	.036

mean difference is significant at the $p \leq .05$ level

* Normalized data used to compare differences in social support scores by grade-level

Table 4.0: Pearson’s Correlations among Enjoyment, Social Support, and Self-efficacy

	<u>Pearson R:</u>	<u>p-value</u>
Enjoyment – Social Support	.503**	.000
Enjoyment – Self-efficacy	.285**	.000
Social Support – Self-efficacy	.502**	.000

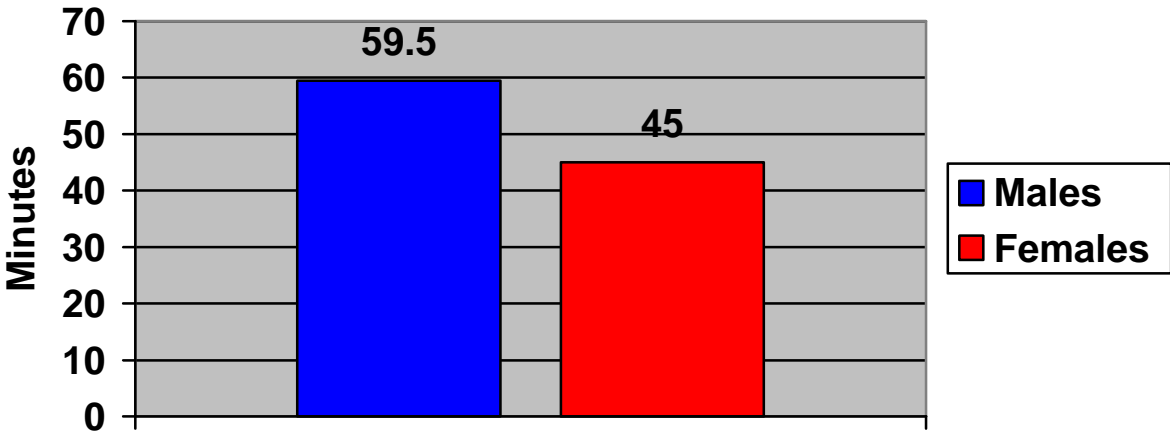
** Correlation is significant at the $p \leq 0.01$ level

Table 5.0: Pearson’s Correlations between Total Physical Activity and Enjoyment, Social Support, and Self-efficacy

	Pearson’s Correlation	Sig.
Total Physical Activity – Enjoyment	.077	.085
Total Physical Activity – Social Support	.045	.318
Total Physical Activity – Self-efficacy	- .013	.777

** Correlation is significant and the $p \leq .05$ level

Figure 1.0: Median Minutes of Daily Total Physical Activity (TPA) by Gender



Bibliography

- 1 Daley, B.J., (2002). School based physical activity in the United Kingdom: can it create physically active adults?. *National Association of Physical Education and Higher Education*. 54, 21-33.
- 2 Silverman, S., (2005). Thinking long term: physical education's role in movement and mobility. *National Association for Kinesiology and Physical Education in Higher Education*. 57, 138 – 147.
- 3 Sallis, J.F., Hovell, M.F., Hofstetter, C.R. (1992). Predictors of adoption and maintenance of vigorous physical activity in men and women. *Preventive Medicine*. 21: 237 – 251.
- 4 Welk, G.J. (1999). The youth physical activity promotion model: a conceptual bridge between theory and practice. *Quest*, 51: 5 – 23.
- 5 Tappe, M. K., Burgeson, C. R. (2004). Physical education: a cornerstone for physically active lifestyles. *Journal of Teaching In Physical Education*. 23: 281 – 299.
- 6 Tomassoni, T.L. (1996). Introduction: the role of exercise in the diagnosis and management of chronic disease in children and youth. *Med Sci Sports Exercise*. 28 (4): 403 – 405.
- 7 Ignico A.A., Mahon A.D. The effects of a physical fitness program on low-fit children. (1995). *Res Q Exercise Sport*. 66 (1): 85 – 90.
- 8 U.S. Department of Health and Human Services: Physical activity and health: a report of the surgeon general. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. 1996
- 9 Ferguson, K.J., Yesalis, C.E., Promrehn, P.R., Kirkpatrick, M.B. (1989). Attitudes, knowledge, and beliefs as predictors of exercise intent and behavior in school Children. *Journal of School Health*. 69: 112 – 115.
- 10 Wallhead, T.L., Buckworth, J. (2004). The role of physical education in the promotion of youth physical activity. *Quest*. 56: 285 – 301.

- 11 McKenzie T.L. (2003). Health-related physical education: physical activity, fitness, and wellness. In S.J. Silverman, & C.D. Ennis (Eds.), *Student learning in physical education: Applying research to enhance instruction* (2nd ed. pp. 207 – 226). Champaign, IL: Human Kinetics.

- 12 Prochaska, J.J., Sallis, J.F., Slymen, D.J., McKenzie, T.L. A longitudinal study of children's enjoyment of physical education. *Ped Exerc Sci.* 15: 170-178. 2003

- 13 Mohnsen, B. Concepts and principles in physical education: what every student needs to know (2nd edition) National Association for Sport and Physical Education an association of the American Alliance for Health, Physical Education, Recreation, and Dance. 2003.

- 14 Moving into the future: national standards for physical education, a guide to content assessment. National association for sport, physical education, recreation, and dance. 1995.

- 15 Physical Activity and Public Health: A recommendation from the centers for disease control and prevention and the American college of sports medicine. *Jour Amer Med Assoc.* 273: 402-407.

- 16 Prakash, M. Physical inactivity a leading cause of disease and disability, warns world health organization. *Washington Post.* April 2002.

- 17 J.F. Sallis, Age-related decline in physical activity a synthesis of human and animal studies, *Med Sci Sport Exerc* **32** (2000), pp. 1598–1600.

- 18 T.N. Robinson, L.D. Hammer and J.D. Killen *et al.*, Does television viewing increase obesity and reduce physical activity? Cross-sectional and longitudinal analyses among adolescent girls, *Pediatrics* **91** (1993), pp. 273–280.

- 19 T.N. Robinson and J.D. Killen, Ethnic and gender differences in the relationships between television viewing and obesity, physical activity and dietary fat intake, *J Health Educ* **26** (1995) (suppl), pp. 91–98.

- 20 R.H. DuRant, T. Baranowski, M. Johnson and W.O. Thompson, The relationship among television watching, physical activity, and body composition of young children, *Pediatrics* **94** (1994), pp. 449–455.

- 21 S.Y.S. Kimm, N.W. Glynn and A.M. Kriska *et al.*, Decline in physical activity in black girls and white girls during adolescence, *N Engl J Med* **347** (2002), pp. 709–715.

- 22 J.F. Sallis, Age-related decline in physical activity a synthesis of human and animal studies, *Med Sci Sport Exerc* **32** (2000), pp. 1598–1600.
- 23 Bandura, A. Self-efficacy mechanism in human agency. *American Psychologist*, 37, p. 122-147. 1982
- 24 Bandura, A. *Self-efficacy: The exercise of control*. New York: Freeman. 1997
- 25 R.M. Ryan and E. L. Deci. *Self determination theory and the facilitation of intrinsic motivation, social development and well-being*. Amer Psych. 2000
- 26 Escarti, A., Gutierrez, M. Influence of motivational climate in physical education on the intention to practice physical activity and sport. *European Jour Sport Sci*. 1: 4. 2001
- 27 Olafson, L. I hate physical education; Adolescent girls talk about physical education, *Phys Educator*. 59: 67-74.2002
- 28 Portman P.A. Are physical education classes encouraging students to be physically active?: experience of ninth graders in their last semester of required physical education. *Phys Educator*. 60. 150-162. 2003.
- 29 Treiber FA, Baranowski T, Braden DS, Strong WB, Levy M, Knox W. Social support for exercise: relationship to physical activity in young adults. *Prev Med*. May;21(3):392.1992
- 30 Strauss RS, Rodzilsky D, Burack G, Colin M. Psychosocial Correlates of Physical Activity in Healthy Children. *Archives of Pediatric and Adolescent Medicine* 2001;155:897-902.
- 31 Dishman RK, Motl RW, Sallis JF et al. Self-Management Strategies Mediate Self-Efficacy and Physical Activity. *Am J Prev Med*. 2005 Jul;29(1):10-8.
- 32 Van Mechelen, W., J. W. R. Twisk, G. B. Post, J. Snel, and H. C. G. Kemper. Habitual activity of young people: the Amsterdam Growth and Health Study. *Med. Sci Sports Exerc*. 32: 1610–1616, 2000.
- 33 Telama, R., and X. Yang. Decline of physical activity from youth to young adulthood in Finland. *Med. Sci. Sports Exerc*. 32: 1617–1622, 2000.
- 34 Kimm SY, Glynn NW, Kriska AM, Fitzgerald SL, Aaron DJ et al. Longitudinal changes in physical activity in a biracial cohort during adolescence. *Med & Sci Sports & Exer*. 32(8):1445-1454, August 2000

- 35 Aaron DJ, Storti KL, Robertson RJ et al. Longitudinal Study of the Number and Choice of Leisure Time Physical Activities From Mid to Late Adolescence. *Arch Ped. Adol Med.* 156:1075-1080: 2002.
- 36 Daly AJ. School Based Physical Activity in the UK: Can it Create Physically active adults? *Nat. Assoc for Phys Educ in Higher Educ.* 54: 21-33. 2002
- 37 Report of the Surgeon General Physical Activity and Health Executive Summary. U.S. Department of Health and Human Services. Centers for Disease Control and Prevention National Center for Chronic Disease Prevention and Health Promotion. The President's Council on Physical Fitness and Sports. 2005.
- 38 Fox K.R. Understanding young people and their decisions about physical activity. *British Journal of Physical Education.* 25 (1), 15-19.
- 39 Tappe, M.K. and Burgeson C.R. Physical Education: A cornerstone for physically active lifestyles. *Journal of Teaching In PE.* 23, 284-299 2004 *Human Kinetics*