2010

Adolescents' expectancy beliefs and task values for physically interactive video games

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ADOLESCENTS' EXPECTANCY BELIEFS AND TASK VALUES FOR PHYSICALLY INTERACTIVE VIDEO GAMES

A Thesis

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

In

The Department of Kinesiology

by

Andrew James McGregor
B.S., Louisiana State University, 2008
August 2010

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ABSTRACT

The health benefits associated with appropriate levels of physical activity are well documented, but a large percentage of the population is not sufficiently active to attain those health benefits. Children are also not as active as they should be, and their activity levels decline during adolescence. Given that childhood activity patterns are likely to persist into adulthood, it is important to investigate ways to encourage children and adolescents to be physically active. Since virtually all school students participate in physical education programs, one way to do that is to explore ways that physical education programs can motivate children to be physically active. This study examined adolescents' motivation in middle school physical education and in physically interactive video games within an expectancy-value model developed by Eccles and her colleagues (1983). One hundred and one eighth grade physical education students completed questionnaires assessing their expectancy-related beliefs, subjective task values, and intention for future participation in both the domains of physical education and physically interactive video games. Participants' activity level was also assessed using the Godin and Shephard (1985) Leisure Time Exercise Questionnaire. Results indicated that expectancy-related beliefs and subjective task values are domain specific. Expectancy-related beliefs and task values are positively related and both constructs are related to intention to participate in the future for both the domains of physical education and physically interactive video games. Expectancy-related beliefs, task values, and intentions across domains, however, were not related supporting the hypothesis that physically interactive video games represent a distinct domain from traditional physical education activities. Physical education was perceived as more important and more useful than physically interactive video

games, but findings suggest that girls and less active students found physically interactive video games to be more interesting than traditional physical education activities. Taken together, the findings suggest that physically interactive video games could be a useful tool in physical education programs to increase physical activity levels for students who are at risk for low levels of physical activity.

INTRODUCTION

The decline in physical activity patterns among youth in the United Sates is a major concern for combating childhood overweight (Troiano et al., 2007). The obesity epidemic has gained the attention of health promoters and lawmakers alike; together these special interest groups are searching for interventions that will decrease the rate of obesity in children. Examining motivational factors that contribute to a healthy lifestyle is a key component in identifying the best research based interventions for children and adolescents. One theoretical framework that offers a multidimensional approach for exploring motivational issues in physical activity is Eccles' expectancy-value theory of achievement motivation (Wigfield & Eccles, 2000). The expectancy-value theory can be used to examine motivation in physical education programs. Physical education in schools offers the ideal setting for students to explore, learn, and connect with activities that can become lifelong modes of health promoting behavior (McKenzie, 2003).

As technology advances and children and adolescents find different ways to stay physically active, it is important that physical education practitioners adapt to the ever changing interests of their students. Video gaming has become ingrained in our society and persons of all ages, especially children, already play on a regular basis (Dorman, 1997). In recent years there has been a plethora of interactive video games on a number of different gaming systems that require the participant or participants to be physically involved in game play. The potential of physically interactive video games (PIVGs) to be used in physical education classes, settings outside of school such as community centers, or at home, to

increase physical activity levels is a recent topic of research interest. The possibility that children growing up today may be more inclined to use PIVGs to meet physical activity guidelines over more traditional forms of exercise is worth exploration (Sell, Lillie, & Taylor, 2008). Examining the motivational factors that influence children's and adolescents' participation in PIVGs, will hopefully provide practitioners with information to design effective intervention strategies for students to enjoy physical activity.

REVIEW OF LITERATURE

Physical inactivity is a major health concern for our nation's youth. A sedentary lifestyle has been identified as a major contributor to obesity in this country (U.S. Department of Health and Human Services (USDHHS), 2008). The fact that children of obese parents face a high risk of being overweight, compounded by the fact that overweight children have a higher risk of being overweight or obese as adults paints a very grim cyclic picture for our country's future children (Agras, Hammer, McNicholas, & Kraemer, 2004). The prevalence of childhood overweight is on the rise. Examination of the National Health and Nutrition Examination Surveys (NHANES) data reveals dramatic increases in the percentage of children classified as obese (Centers for Disease Control, 2009). Specifically, estimates for obesity reates for children aged 6-11 years increased from 11.3% in 1988-1994 surveys to 19.6% in 2007-2008. For youth aged 12-19 in that time frame, rates increased from 10.5% to 18.1%. As a result of these disturbing numbers, governmental agencies and health promoters around the country have recognized this problem and have issued guidelines for Americans to use and help combat the obesity epidemic. In 2008 the U.S. Department of Health and Human Services issued its Physical Activity Guidelines for Americans (USDHHS, 2008). Recommendations include, 60 minutes or more of either moderate- or vigorous- intensity aerobic physical activity a day for children and adolescents (USDHHS, 2008).

Meeting the recommendations set forth by USDHHS presents several challenges for certain subpopulations of children and adolescents who are constricted by social and environmental factors. Gordon-Larson, McMurray, and Popkin (2000) found that non-Hispanic black and Hispanic adolescents' inactivity rates were higher and moderate to vigorous physical

activity were lower than their non-Hispanic white and Asian counterparts. One environmental factor that decreases the likelihood of attaining the highest category of moderate to vigorous activity is total reported incidents of serious crime (Gordon-Larson et al., 2000). The fact that the highest percentage of non-Hispanic blacks (58.1%) and Hispanics (41.5%) lived in high crime areas may contribute to decreased rates of moderate to vigorous physical activity (Gordon-Larson et al., 2000). For children and adolescents who grow up in neighborhoods that are not safe and conducive to physical activity school Physical Education programs, community centers, and other physical activity opportunities become increasingly important.

The amount of time children and adolescents spend in physical education at school varies by state, school district, and grade level. Without belaboring the marginalization of physical education in schools, it is important to note that "no federal law mandates the teaching of physical education in schools" (Martin, 2003, p.57). Depending on the state requirements, children can receive anywhere from 30 to 150 minutes per week of physical education at the elementary level, and 80 to 275 minutes per week at the middle school level, and from "none specified" to 225 minutes per week at the high school level (Martin, 2003, p.58). Based on these findings even the highest requirements of physical education time allocated per week cannot satisfy the USDHHS recommendations of 60 minutes per day every day of the week for children and adolescents. Even in a model physical education program, it would be naive to assume that students are active for the entire time allocated during physical education. The reality that instructional time, transitions, and managerial processes decrease the amount of time students actually spend being physically active has led the (USDHHS) Healthy People 2020 to retain the goal of students being physically active 50% of class time

during physical education (USDHHS, 2009). Therefore, the objectives for physical education practitioners from a health perspective should be three fold, (a) to increase the time their students spend in moderate to vigorous physical activity to the best of their circumstances, and (b) to expose their students to as many health promoting activities as possible, and (c) empower their students with information they can use to implement health promoting behaviors outside of school (McKenzie, 2003).

Parks and recreation organizations, community centers, and athletic clubs provide opportunities for people of all ages, especially children and adolescents, to engage in health promoting physical activity. Availability of these services to children and adolescents who may use these outlets to be physically active is often times hindered by external environmental factors such as low socioeconomic status (SES) or geographical restrictions (Gordon-Larsen et al., 2000). Community centers, parks, and recreation facilities that offer a safe place for children to be physically active may not be available to low SES families due to the financial costs of running and maintaining facilities in their community. Athletic clubs and organizations that offer competitive and recreational opportunities can vary widely in financial costs depending on the type of sport, time and resources spent traveling to and from practices and games. The financial costs of children's and adolescents' participation in athletic clubs and organizations can constitute a large demand on monetary resources that a family of low SES simply cannot afford. Community leaders and lawmakers must find ways to provide adequate opportunities for children and adolescents of low SES to engage in physical activity outside of school to help reduce the health disparities seen in low SES and minority populations.

Physical activity has been associated with a number of health benefits for all people no matter age, sex, race or economic status. Physical activity can be an "effective prevention strategy against cardiovascular diseases, diabetes mellitus, colon and breast cancer, obesity, hypertension, osteoporosis, and depression" (Warburton, Nicol, & Berdin, 2006). Despite the value of daily physical activity, many Americans choose not to participate in regular planned physical activity, with only 42% of children meeting the recommended levels of physical activity (Troiano et al., 2007). As stated earlier, social and environmental factors do play a large role in having the opportunity to participate in physical activity, but understanding why some members of our society choose not to participate while having the means to do so is more a question of a motivation.

Expectancy-Value Model of Achievement Choice

Several researchers over the years have developed many different theories and models to help explain and identify factors that affect a person's choices and participation behaviors, and ultimately their motivation. One such theory was developed by Eccles et al. (1983) and their initial interest in understanding achievement motivation was sparked by gender differences in educational and career decisions, especially in mathematics. Eccles and her colleagues sought to understand why "girls were less likely to choose an educational path involving mathematics that would lead to high-status jobs and careers, despite having similar ability and performance measures as boys" (Weiss & Amorose, 2008, p.139). This work led to the development of a "comprehensive model that describes and explains behavioral variations in choice, persistence, and performance in children and adolescents across achievement domains" (Weiss & Amorose, 2008, p.139).

Expectancy-value theory has been applied to a number of different settings including sport. It has been used to investigate the relationships among self-beliefs and task beliefs with activity choices and participation behaviors, and to explore the social and psychological determinants of ability perceptions and task value (Weiss & Amorose, 2008). According to the model, there are two major determinants that directly influence achievement choices and behaviors, expectancies of success and subjective task value. Expectancies of success refer to a person's competence beliefs in a particular achievement domain. The sense of how well they will do on an upcoming task reflects the person's beliefs about one's own ability and the possibility of success or failure (Xiang, McBride, Guan, & Solmon, 2003). Subjective task value, the second major determinant, refers to the importance that the person places on being successful in an achievement domain. Four components make up subjective task values: attainment value, intrinsic value, utility value, and cost (Eccles et al., 1983). Attainment value is the importance a person places on being successful in that particular achievement domain. Intrinsic value is the interest or enjoyment one receives from participating in the task. Utility value is the usefulness of the task for future and current goals. Cost is what is lost or sacrificed for participating in the task.

Eccles et al. (1983) have identified several psychological and social-contextual factors that shape a person's expectancy-related beliefs and task values, which indirectly influence achievement behavior. According to the model, gender role and activity stereotypes, socializers' beliefs and behaviors, and past achievement experiences, can all influence the child's perceptions and interpretations, the child's goals, self-schemas, and affect. With an

understanding of the constructs in the model, reviewing the current literature on expectancy-value theory provides insight into what motivates children and adolescents to be active.

Researchers have sought to understand how and why expectancies of success and task values differ across age levels, genders, domains, and different environmental contexts. From a developmental perspective children at an early are able to distinguish between their expectancy-related beliefs and task values, when comparing the domains of math, reading, and sports. Although children can identify the different constructs, the different components of subjective task values, and expectancies of success were found to be less clearly identifiable by children in grades five and below (Eccles, Wigfield, Harold, & Blumenfeld, 1993). In general expectancies of success and task values have been found to decline across the childhood and adolescent years (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). Several explanations have been proposed for the decrease change in expectancies of success and task values. As children age their evaluation of feedback and social comparison become more accurate and realistic accounting for the decline in certain activities. Environmental changes in school such as a more competitive situation have also been proposed to account for the change to more negative achievement beliefs (Wigfield, 1994).

Expectancy-value model in physical education. The application of the expectancy-value model to the closely related domains of physical education and sport, share many commonalities with previous work done in the academic setting. Eccles and colleagues (1983) proposed that expectancy-related beliefs and task values should be positively linked. Recent research in the physical education domain has supported this positive link between expectancy-

related beliefs and task values. Xiang et al. (2003) demonstrated positive relationships between expectancy-related and task values for the domains of physical education and throwing for second and fourth grade elementary physical education students.

Researchers in physical education have also examined the contribution of expectancy-related beliefs and task values on performance and intention to engage in activities in the future. Children's Performance in a 1-mile running test was found to be significantly predicted by the child's ability beliefs (Xiang, McBride, & Bruene, 2006). Subjective task values have been found to be better predictors of intention as seen in middle school physical education students (Gao, Lee, Solmon, & Zhang, 2009).

Gender influences. Gender differences have been one of the main topics of interests for researchers using the expectancy-value theory. The phenomenon of "gender-role intensification" occurs when adolescents choose activities that support gender-role stereotypes and this can have an effect on achievement behaviors (Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991). For example Eccles and Harold (1991) found boys' self rated ability beliefs and task values were higher for sports, and girls' self rated expectancies and value in reading and English were higher at the elementary and middle school levels. As described in the model, different social-contextual factors may influence how a child perceives different gender-role stereotyped activities over time. The role of significant others such as parents, coaches, friends and siblings have been found to have both a positive and negative influence a child's achievement choices and behaviors. Significant others, particularly parents, who have lower

ability-beliefs for their children, are not supportive, and do not provide choices in sports have been found to have a negative influence on their child's achievement behavior (Stuart, 2003).

Physical education and its strong ties to traditional team sport activities, encompasses many of the same gender role and activity stereotypes seen in sports (Azzarito, Solmon, & Harrison, 2006). The teaching of sport-based multi-activity curriculum in schools is a widely practiced model within physical education. The short amount of time spent on units in this model encourages highly skilled participants to dominate game play, while lower skilled participants never develop the technical and tactical skills necessary for successful game play. Often times, male participants have greater experience in traditional sports and are the ones who excel in the multi-activity curricula (Ennis, 1999). These findings contribute to fact that physical education is perceived as male dominated, with boys acquiring higher expectancies for success (Xiang et al., 2003).

Physical activity contexts. Researchers investigating expectancy-value model constructs within the physical education settings must also be aware of how the context of the activity can change the nature of achievement and motivation (Chen, Martin, Ennis, & Sun, 2008). Students' enrollment in physical education may be required and motivation to perform well in the class may be driven by different factors in school than outside of school for the same activity. When identifying the content domain in which researchers are trying to assess, it is important to take into account expectancy-beliefs and task values can differ for certain tasks within the same content domain (Chen et al., 2008). In the physical education setting Xiang et al. (2003) found expectancy-related beliefs and task values for the domain of physical education

in general, and expectancy-related beliefs and task values for the specific domain of throwing to be differentiated. The importance of examining expectancy-beliefs and task values of specific domains within the physical activity setting has led researchers to use the expectancy-value model as a framework to investigate the effectiveness of different approaches to increasing children's and adolescents' physical activity levels.

Physically Interactive Video Games

There has been evidence in recent years that video gaming has contributed to a sedentary lifestyle in children and adolescents (Dorman, 1997). It may be possible to counteract the current negative connotations associated with video gaming and childhood overweight through the use of PIVGs by children and adolescents. PIVGs may have the potential to improve a number of health and skill related components of physical fitness (Trout & Christie, 2007). Many PIVGs incorporate sport themes and simulate different movements involved in that particular sport. Despite the large number of PIVGs that incorporate sports, to date, there have been no published studies that have investigated the possibility of skill transfer to the sports context. Video game makers have the ability to influence a large portion of the population. For example, by 2002 Sony increased its revenue to $36 billion from video games (Trout & Christie, 2007). Examining the available research on PIVGs can yield insight into what types of games and gaming systems are currently available, how much energy is expended during the different types of game play, why PIVGs may be motivating to young people, and where and how are they being used in today's society.

PIVGs are available in a number of different forms ranging from arcade style games to built-in cameras, and accessories that allow for interactive game play. Microsoft Xbox, Sony Playstation, and Nintendo Wii, some of the largest video game producers, all have the capability and have created a number of PIVGs. Other less know systems such as Cybex Trazer, Cateye Game Bike, and Sportwall, all offer interactive game play that can be used to increase physical activity. Depending on the system used the financial cost of these gaming systems can range from a few hundred dollars to several thousands (Trout & Christie, 2007).

Sony Playstation in 2003 released the Eyetoy ($30) accessory which uses a motion sensitive camera to transmit the player's image onto the screen. Players can engage in several different games that use the movements of the body to control whatever skill the game requires. Nintendo Wii uses a similar motion tracking device that picks up the movement of the controller to produce the specific skills required of the game. Among one of the most popular PIVGs is Dance Dance Revolution (DDR). DDR ($300-$4,000) can be utilized as an arcade style game, or be used in conjunction with Microsoft Xbox and Sony Playstation consoles with the purchase of a 3-foot by 3-foot pad. Whether using the arcade style or the accessory pad, the content of the game is the same, requiring participants to perform coordinated movements to the beat of techno music by touching the arrows on the pad in the order presented on the screen. Cybex Trazer ($6,495) is a computer based system that uses an infrared transmitter belt to track the participant's movement on the screen. This system allows players to engage in functional games that can be used to assess reaction time, power, agility, balance, and provides real time feedback such as heart rate and estimated caloric expenditure to the participants. The Cateye Gamebike ($350-$2,300) system which operates on Playstation, uses a stationary

bicycle to control different aspects of game play such as pedaling to control the speed of the virtual object you are racing and control turns with the steering wheel. Sportwall ($6,000-$19,000) comprised of an interactive station that utilizes a 4-foot by 8-foot platform with different game options that enhance motor-skills through identifying and touching the section of the wall that is illuminated (Trout & Christie, 2007).

The wide variety of interactive gaming systems available offers a number of different ways to be physically active. The recent research involved in quantifying the exact levels of energy expenditure required to perform PIVGs has produced some promising findings. Although this area of research has gaining momentum, the sheer number of games being developed and produced is large, and will require constant attention by the academic community to evaluate their effectiveness. Energy expenditure has been investigated for a number of PIVGs, Ridley and Olds (2001) found a wide range of energy expenditure for children playing 4 types of video games (7.6-26.5 mL/kg x min-1 and 0.09-0.57 kJ/kg x min-1 respectively). The amount of variability in energy expenditure can be attributed to the type of game being played and the specific muscle groups involved. Games that engage the larger muscle groups of the lower body seem to increase the intensity of the movements, which increases energy expenditure. One can argue that any activity is better than none, but the goal of health promoters should be to identify and use the PIVGs that elicit higher intensity movements that meet or exceed moderate to vigorous physical activity (MVPA) responses set forth by the U.S. Department of Health and Human Services Guidelines for Americans.

One consideration that must be taken into account when dealing with PIVGs is experience level of the participant. Sell et al. (2008) found that energy expenditure differed according to the experience level of the participant while using DDR. Experienced players reached a percent-age of oxygen consumption reserve (VO_2R) equivalent to moderate intensity exercise, while inexperienced players achieved a VO_2R equivalent to light intensity, according to the ACSM guidelines (Sell et al., 2008). The fact that less experienced players expend less energy may seem discouraging, but the design of PIVGs like DDR, offers different levels of difficulty that contributed to this difference. Although the time required to be considered experienced at different PIVGs will be highly individualized and variable, DDR is a prime example of how PIVGs do have the capability to generate moderate intensity physical activity.

Lower energy expenditure might be considered a drawback upon initiation of PIVGs at novice or beginner skill levels, but may prove beneficial in motivating participants to persist at the activity as their skill level grows (Solmon, 2003). The ability of PIVGs to offer participants of different skill levels the opportunity to experience success will in turn provide positive achievement experiences. As the expectancy-value model depicts, these successful achievement experiences will increase the perceived competence of the participants which is a strong predictor of achievement behavior (Weiss & Amorose, 2008).

PIVGs have also been found to influence a person's subjective task values. In the study by Sell et al. (2008) the participants were asked to rate their enjoyment level while playing DDR. The results from this study found that while experienced players on average had higher scores than inexperienced players, all participants preferred game play over treadmill walking (Sell et

al., 2008). Enjoyment from PIVGs over more traditional forms of exercise such as walking or cycling can impact adherence rates for exercise programs. Warburton et al. (2007) demonstrated this by setting up a recommended training program for six weeks with two groups of low active young males. Attendance rates in the group using interactive video gaming system linked to an exercise bike were significantly higher than the group using a standard stationary cycle ergometer. The interactive video game group had a frequency of approximately 30% higher attendance over the 6 week period than the traditional training group (Warburton et al., 2007). Another interesting finding from this study is while attendance rates declined over the six weeks of the training program for the traditional program, the interactive video game group's attendance rates held constant. The interactive video game group also demonstrated gains in maximal aerobic power (VO_2 max), while the traditional group experienced no change (Warburton et al., 2007).

Using PIVGs in Physical Education

Increased motivation to participate in PIVGs can be viewed through an educational perspective. If physical education teachers can use PIVGs to increase the motivation of their students, the opportunity to learn and promote healthy behaviors grows. Chen et al. (2008) demonstrated how enhanced motivation leads to effective learning. Physical education programs that have a limited amount of time with students to teach and have them acquire the complex motor skills of the activity can benefit from the use of PIVGs because they can be used to challenge participants of varying abilities. The social implications from children and adolescents of different abilities and genders competing and enjoying activities together can aid in creating a socially tolerant environment.

The state of West Virginia is a perfect example of implementing physically interactive video games into their public schools to enhance physical education programs (Trout & Christie, 2007). The state purchased one machine of Dance Dance Revolution (DDR) for each of its public schools. DDR is not the only arcade style game that can be used in physical education, nor the only type of gaming system that can be used. The PIVG makers of Cybex Trazer, and Sportwall, provide ideas and lesson plans for practitioners to utilize in physical education and outside of school. Due to the cost and limited participation at one time of PIVGs, physical education practitioners must be creative and maximize the available resources for technology in the gym. Grant money is one option that offers physical educators the ability to supplement some of the cost of these machines. Physical education programs can apply for the Carol M. White Physical Education Program (PEP) grants or Enhancing Education Through Technology (EETT) grant money which provides millions of dollars for the enhancement of physical education and enhancement of education opportunities through technology (Trout & Christie, 2007).

Physical education is not the only outlet for physically interactive game play to occur. Many community centers and recreation facilities have incorporated PIVG as means of being active and trying to engage youth with fun, safe places to socialize. The Recreation and Parks Commission for the Parish of East Baton Rouge (BREC) organization's Interactive Warehouse is a prime example of offering a facility for children and adolescents to engage in a number of PIVGs such as DDR, and other more traditional interactive games like table hockey (BREC, 2010). The popularity of children and adolescents owning game consoles such as Xbox, Playstation, and Wii, PIVGs use at home has also becoming common place. Funk (1993)

reported children in grades 7-8 spend around 4.2 hour per week playing traditional video games. As technology grows and PIVGs become prevalent in the video gaming market, the replacement of traditional video games with PIVGs could have a huge impact on energy expenditure of children and adolescents.

Given the widespread use of video gaming in our society by children and adolescents, one important area of inquiry, is to examine how physically interactive video games motivate children and adolescents of different physical abilities compared to more traditional forms of activity. The expectancy-value theory has been validated for use in several different achievement domains; although this model has not been used to examine motivation for PIVGs, it provides a framework to investigate motivational constructs of PIVGs.

Problem Statement

The video game industry is a multi-billion dollar operation that has captured the attention of all ages of participants and is common place around the globe (Trout & Christie, 2007). Video games that have a sport context have evolved into interactive games in which the participants are actively simulating the movements and procedures that are performed in the actual sporting event, or involve participants in tasks that expend energy. Initial research efforts have provided some evidence that individuals may be more willing to adhere to training programs that incorporate PIVGs as compared to traditional training programs, but there is little, if any, research evidence concerning adolescents' perceptions of PIVGs and how those perceptions translate to motivation to be physically active. The purpose of this study, therefore, is to use the expectancy-value model of choice as a framework to explore how their

expectancies and values in PIVGs compare to those in physical education activities. Given the widespread use of video games in our society and the familiarity of these systems with children and adolescents, it seems worthwhile to explore the feasibility of using PIVGs in physical education to promote physical activity.

Hypotheses

Using the expectancy-value model as a framework, and based on the literature to date, the following hypotheses were proposed:

a) Adolescents' expectancy-related beliefs, task values, and intentions would be positively related within physical education and PIVGs domains.
b) Expectancy-related beliefs, task values, and intentions would be distinct between the domains of physical education and PIVGs, and that expectancy-related beliefs, task values, and intentions would be higher for PIVGs than for physical education.
c) Boys would have higher expectancy-related beliefs, task values, and intentions than girls in both domains of physical education and PIVGs.
d) Adolescents who are more active would have higher expectancy-related beliefs, task values and intentions for physical education than less active adolescents, but there would be no differences in expectancy-related beliefs and task values between more and less active adolescents on PIVGs.

Definitions

Physically interactive video games (PIVGs) include all gaming systems and games that have the ability to produce energy expenditures equal to or above the classification of light

aerobic activity. PIVGs also include games and gaming systems that target other health benefiting activities such as improving muscular strength, balance, and coordination.

Assumptions and Limitations

The researcher assumes that participants who state that they are familiar with PIVGs have a working knowledge of the physical and psychological demands required of game play. Limitations of this study will include the sample administered at only one location, and not being able to identify the economic status of the participants.

Significance

This study will provide a sound theoretical examination of adolescent's motivation to participate in PIVGs. The results of this study may help practitioners and health promoters develop curriculums and strategies that are effective in providing interesting, challenging, useful, and safe opportunities for adolescents of all ability levels and genders.

METHODS

Participants

Participants were 101 (42 boys and 59 girls, mean age = 13.62, sd = .53; self-reported ethnicity: 1 American Indian, 14 Asian/Pacific Islanders, 46 African Americans, 32 Caucasian/White, 8 multi-racial) 8th grade physical education students recruited from a public middle school located in an urban school district in a mid-sized city in the Southeast U.S. All 8th grade boys and girls within the school were asked to participate. The public school setting was chosen for the collection site for a number of reasons: 1) This population represents children from a wide range of different family income levels; and 2) The school setting includes adolescents who had both high and low value for sport and physical activity, as well as varying levels of fitness. After acquiring permission from the Institutional Review Board of the University and the school district, each parent or guardian of the participants was asked to provide an informed consent and participants signed a child assent. All participants who returned the informed consent, and voluntarily chose to participate were included in the study.

Instruments

A survey was used to assess the participants' expectancy-related beliefs and task values for the domains of physical education and PIVGs. The questionnaire originally developed by Eccles et al. (1983) was modified to address the domain specific questions for physical education and physically interactive video games. All items were answered using a modified 5-point scale, similar to the one modified and used by Xiang et al. (2003). Previous administrations of these instruments have demonstrated excellent psychometric properties

(Eccles et al., 1983; Xiang et al., 2003). The initial section of the survey provided space to complete demographic information that included age, gender, race, and ethnicity. Subsequent sections measured beliefs about ability, expectancies for success, and components of value (importance, interest, usefulness), and intention for future participation, for both domains of physical education and PIVGs.

Beliefs about ability. Participants rated their general ability in physical education using a five-point response scale and in PE and PIVGs by responding to three questions: 1) How good are you at activities and games in PE/PIVGs? (1= very bad to 5 = very good); 2) If you were to list all the students in your PE class from the worst to best (for PIVGs), where would you put yourself? (1= One of the worst to 5 = One of the best); 3) Compared to most of your other school subjects, how good are you at activities and games in PE/PIVGs? (1- A lot worse in PE/PIVGs to 5=a lot better in PE/PIVGS).

Expectancies for success. Two questions were used to assess expectancies: How well do you think you will learn activities and games in PE/PIVGs this year? (1= Not at all well to 5= Very well); and How good would you be at learning something new in PE/PIVGs? (1= Very bad to 5= Very good).

Attainment value or importance. Two questions addressed this component of value: For me, being good at activities and games in PE/PIVGs is… (1= Not important to 5= Very important); and Compared to your other school subjects (Compared to other activities in PE), how important is it to you to be good at activities and games in PE/PIVGs? (1= Not very important to 5= Very important).

Intrinsic or Interest value. Two questions assessed this construct: In general, I find learning new activities and game in PE/PIVGs is… (1= "Way" boring to 5= "Way" fun); and How much do you like activities and games in PE/PIVGs? (1= Don't like it at all to 5= Like it very much).

Utility value or usefulness. Again, two questions were used: In general, how useful is what you learn in PE/PIVGs? (1= Not useful at all to 5= Very useful); and Compared to your other school subjects, how useful is what you learn in PE/PIVGs? (1= Not useful at all to 5= Very useful).

Intention for future participation. Consistent with Xiang et al. (2003), a single item was used to measure participants' intention to engage in PE and PIVGs in the future: When you get to high school, you will have a choice whether you want to take PE. How much would you want to take it? (1= Not at all to 5= Very much). For PIVGs: If you owned Physically Interactive Video Games. How much would you want to play it? (1= Not at all to 5= Very much).

Physical activity. Self-reported physical activity was assessed using the Godin and Shephard (1985) Leisure Time Exercise Questionnaire. They established concurrent validity for this instrument using measures of body fat and maximum oxygen uptake, and calculated two week test-retest reliability coefficients. They concluded that this instrument is an appropriate assessment of physical activity patterns. The questionnaire contains two questions. The first question consists of three parts: 1) During a typical 7-Day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time? The participant then write in the number of times per week they are engage in a)

Strenuous exercise (heart beats rapidly), b) Moderate exercise (not exhausting), c) Mild Exercise (minimal effort). Each of the specified exercise zones were supplemented with several examples of activities within those zones. The raw data were converted to metabolic equivalents (METs) based on the responses given within each zone. To achieve a total METs score, the researcher used the following formula (9* (number of strenuous exercise episodes))+(5*(number of moderate exercise episodes))+(3*(number of mild exercise episodes))= Activity score in arbitrary units. The second question asks participants to provide a global response about their typical activity levels: 2) During a typical 7-Day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)? The participants then marked one of three answers 1) Often, 2) Sometimes, or 3) Rarely/Never.

Procedures

Arrangements were made in advance with the physical education teachers to distribute the questionnaire on a day that was convenient for the teachers. Due to the nature of the schools block scheduling, data was collected on two consecutive days to include the entire 8th grade population. Every 8th grade physical education student present on these two consecutive days completed the questionnaire in order to maintain the validity and focus of the students during the administration and completion of the 3 section questionnaires. The researchers began each 30 minute testing session for each of the six 8th grade physical education classes by informing the students (a) that there were no right or wrong answers for the questionnaire, (b) their physical education teacher would not have access to their responses, (c) they should answer the questionnaire as truthfully as possible, and (d) encouraging the students to raise

their hand and ask questions if they do not understand. The researcher then administered sections 1 & 2 of the questionnaire which included the demographic information and expectancy-related beliefs and task values for physical education. The researcher then collected the responses for sections 1 & 2 and proceeded to give a brief power point presentation defining physically interactive video games through explanation of visual examples of persons participating in a number of popular PIVGs. Lastly, section 3 of the questionnaire was administered directly after the presentation which included expectancy-related beliefs and task values for PIVGs. Due to unavoidable absence of a large number of 8th grade students participating in an extracurricular band trip, the researcher conducted three additional data collection days. The researcher conducted the data collection procedures in the same manner given on the first two days of data collection, but on an individual and small group basis.

Design and Analysis

Participants were classified into two categories based on the second question of the Godin and Shephard (1985) Leisure Time Exercise Questionnaire. Participants who indicated that they were either sometimes (n = 49) or rarely/never (n = 5) engaged in any regular activity long enough to work up a sweat (heart beats rapidly) were grouped together and labeled “less active” for this study. Participants who responded that they engaged “Often” (n = 47) in regular activity were classified as “More active.”

Pearson product-moment correlations were calculated to identify significant relationships between expectancy-related beliefs, task values, intention for future participation in both physical education and PIVGs, and self reported physical activity levels. To compare

expectancy-related beliefs, task values, and intentions between physical education and PIVGs, a series of 2 (gender) X 2 (activity level) X 2 (type of activity) ANOVAs with repeated measures on the third factor were conducted. The dependent variables in the analyses were expectancy-related beliefs (ability and expectancies for success), task values (importance, interest, and usefulness), and intentions.

RESULTS

The correlations among expectancy-related beliefs, task values, intentions, and physical activity levels for physical education and PIVGs and Cronbach reliability coefficients for all variables are reported in Table 1, found on the following page. Means and standard deviations by gender and level of physical activity are reported in Table 2. Reliability coefficients for all variables exceeded .75, except for expectancies for success in physical education and ability beliefs in PIVGs. These meet the minimally acceptable standard of .60 but results should be interpreted with caution for those two subscales. To ensure that participants were familiar with PIVGs they were asked to indicate how often they played them. All individuals indicated they had experience with these activities.

Examination of the correlations suggests that expectancy-related beliefs and task values are domain specific. For the domain of physical education, expectancy-related beliefs and task values have a pattern of positive correlations, and are related to intentions to take physical education in the future. For the domain of PIVGs, expectancy-related beliefs and task values are positively related, and are related to intentions to play video games in the future, but expectancies and values across physical education and PIVGs are unrelated.

Albeit small there are positive correlations between self-reported physical activity and expectancy-related beliefs and task values in physical education. These relationships for the domain of PIVGs are not significant, with the exception of a small positive relationship between usefulness of PIVGs and self reported physical activity as quantified in METs.

Table 1 Relationships among variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Physical Education													
1. Ability		.560**	.585**	.581**	.465**	.472**	.189	.188	.016	.014	.163	.070	.401**
2. Expectancies			.493**	.590**	.432**	.314**	.281**	.191	.067	.125	.176	.074	.253*
3. Importance				.595**	.579**	.416**	.101	.076	.234*	.043	.304**	.055	.337**
4. Interest					.572**	.491**	.153	.159	.079	.085	.217*	.105	.308**
5. Usefulness						.468**	.034	.013	.112	-.045	.213*	.046	.328**
6. Intent							.024	-.117	-.177	-.174	-.061	-.108	.274**
Physically Interactive Video Games													
7. Ability								.443**	.283**	.511**	.343**	.432**	.107
8. Expectancies									.401**	.547**	.504**	.506**	.104
9. Importance										.342**	.608**	.458**	.111
10. Interest											.511**	.617**	-.013
11. Usefulness												.518**	.288**
12. Intent													.051
13. METs													
Cronbach's Alpha	.84	.61	.784	.834	.789	NA	.66	.78	.848	.853	.755	NA	NA

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

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2 Means by Gender and Activity Level

Variable	Male	Female	More Active	Less Active	Total
	Mean (SD) (n=42)	Mean (SD) (n=59)	Mean (SD) (n=47)	Mean (SD) (n=54)	Mean (SD) (n=101)
Physical Education					
Ability	4.06 (0.85)	3.60 (0.86)	4.17 (0.85)	3.46 (0.77)	3.79 (0.88)
Expectancies	4.24 (0.76)	4.07 (0.93)	4.30 (0.83)	4.00 (0.87)	4.14 (0.86)
Importance	3.68 (1.15)	3.25 (1.02)	3.66 (1.16)	3.22 (1.00)	3.43 (1.09)
Interest	4.21 (0.85)	3.77 (0.94)	4.26 (0.86)	3.69 (0.91)	3.96 (0.92)
Usefulness	3.46 (1.04)	3.19 (1.05)	3.56 (0.96)	3.08 (1.08)	3.31 (1.05)
Intention	4.40 (0.80)	3.19 (1.36)	4.11 (1.17)	3.33 (1.32)	3.69 (1.30)
Physically Interactive Video Games					
Ability	3.94 (0.75)	3.83 (0.71)	3.93 (0.84)	3.83 (0.61)	3.88 (0.72)
Expectancies	3.71 (1.00)	4.05 (0.87)	4.19 (0.82)	3.67 (0.97)	3.91 (0.94)
Importance	2.64 (1.12)	2.53 (1.11)	2.60 (1.24)	2.56 (0.99)	2.58 (1.11)
Interest	3.82 (1.10)	4.09 (0.86)	3.93 (1.09)	4.03 (0.87)	3.98 (0.97)
Usefulness	2.90 (1.08)	2.82 (0.95)	2.97 (1.01)	2.76 (1.00)	2.86 (1.00)
Intention	3.31 (0.98)	3.75 (1.04)	3.55 (1.14)	3.57 (0.94)	3.56 (1.03)
METs	68.99 (28.25)	63.63 (22.86)	80.21 (22.23)	53.07 (20.51)	65.83 (25.21)

To test for differences on expectancy-related beliefs and task values between physical education and PIVGs, a series of 2 (type of activity) X 2 (gender) X 2 (activity level) repeated measures ANOVAs were used.

Expectancy-Related Beliefs

Beliefs about ability. The repeated measures ANOVA for ability beliefs yielded a significant activity level by type of activity interaction [F (1, 97) = 8.66, p = .004]. The main effects and remaining interactions were not significant. As seen in Figure 1, more active students had higher ability beliefs in physical education than less active students, but there those differences were not evident in their ability beliefs about PIVGs.

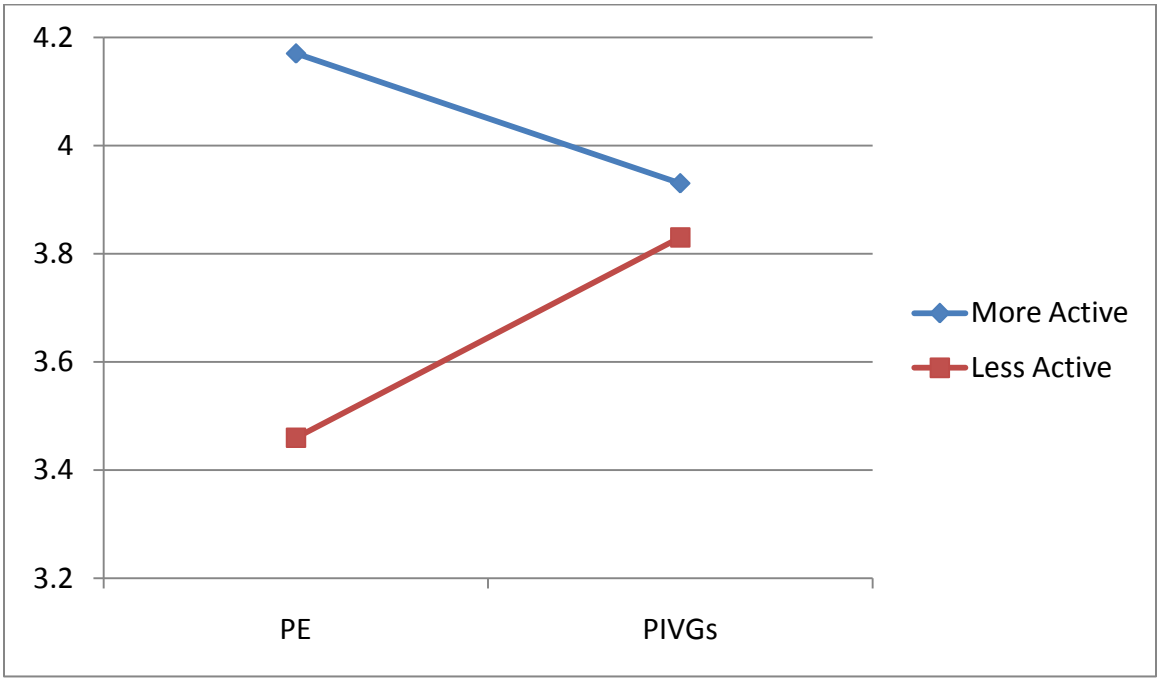

Figure 1: Ability Beliefs

Expectancies for success. The repeated measures ANOVA for expectancies for success yielded a significant main effect for type of activity [F (1, 97) = 5.76, p = .018] and a gender by

type of activity interaction [F (1, 97) = 6.00, p = .016]. Overall, the expectancies for success were higher for physical education than for PIVGs. The interaction is presented in Figure 2. Boys tended to have higher expectancies for success in physical education and lower expectancies in PIVGs, while girls' expectancies tended to be more stable across the types of activities.

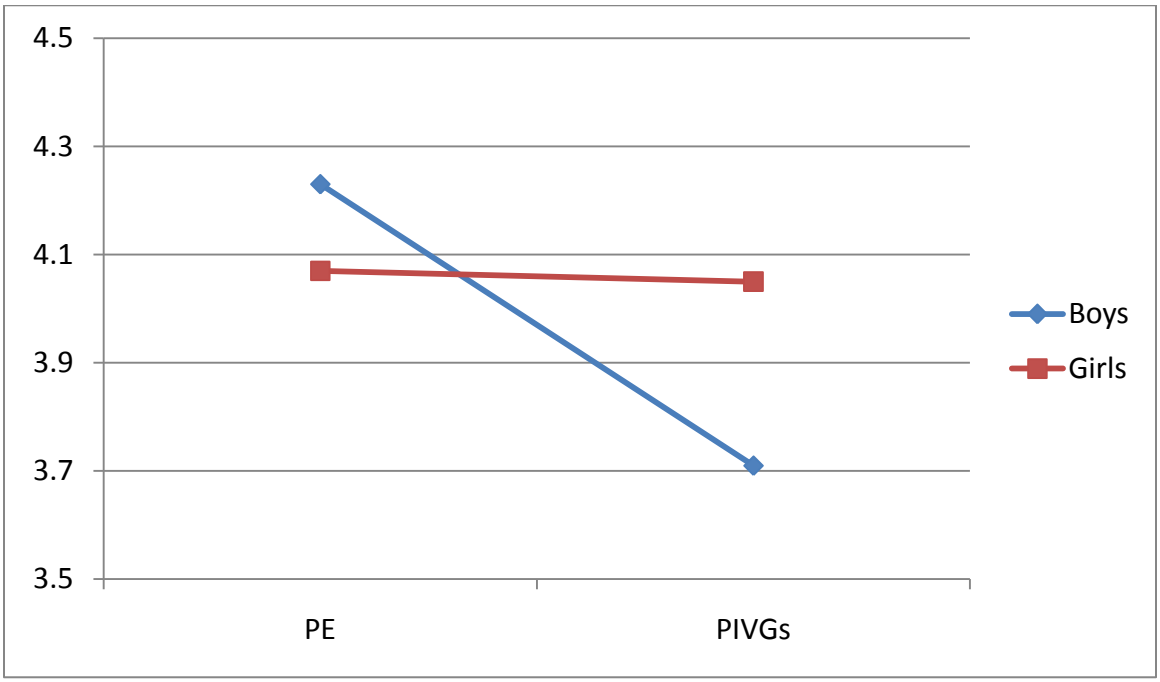

Figure 2: Gender by Type of Activity Interaction for Expectancies

Task Values

Importance. The repeated measures ANOVA for importance yielded a significant type of activity main effect [F (1, 97) = 40.42, p < .001]. As seen in Figure 3, students assigned higher importance to physical education than for PIVGs. The main effects for gender and activity level and the interactions were not significant.

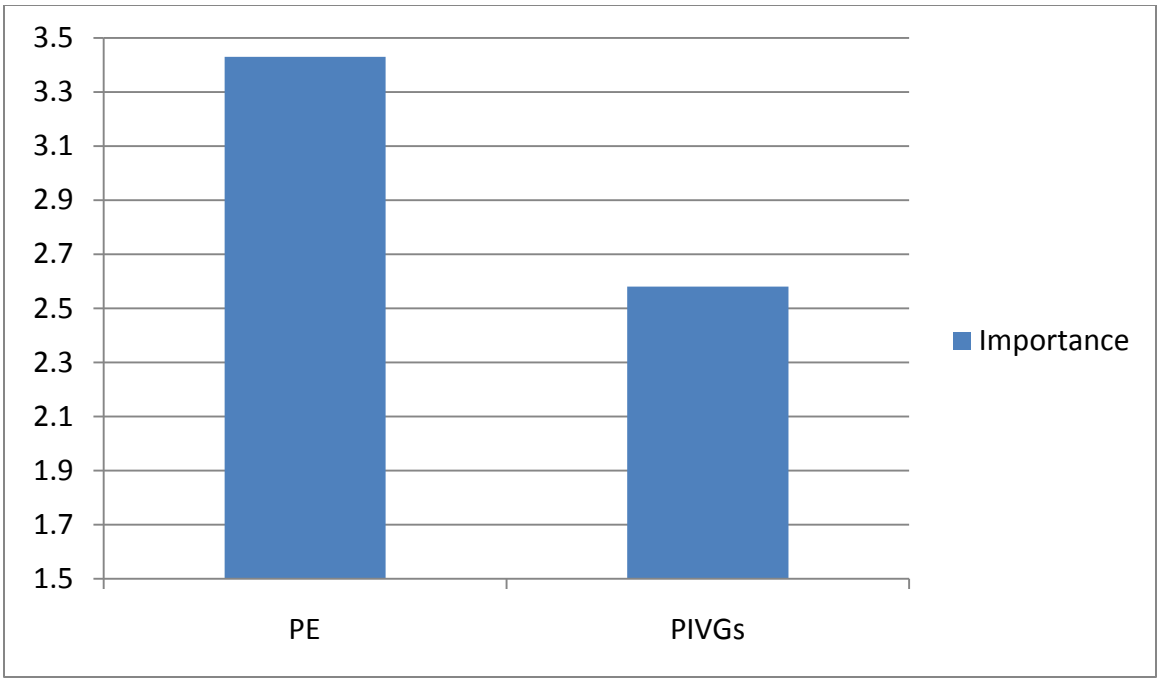

Figure 3: Importance

Interest. The repeated measures ANOVA for interest value yielded no significant main effects. All three two way interactions, however, were significant. As presented in Figure 4, the gender by type of activity interaction [F (1, 97) = 6.21, p = .014] reveals that boys rated physical education higher for interest value than girls, while the opposite occurred for PIVGs where girls' interest value was higher than boys. The type of activity by activity level interaction [F (1, 97) = 4.42, p = .038] is illustrated in Figure 5. More active students had higher levels of interest in physical education than less active students, but the interest levels of both groups on PIVGs was similar. Figure 6 represents the gender by activity level interaction [F (1, 97) = 6.48, p = .013]. For overall interest in both physical education and PIVGs, less active girls reported lower levels of interest than active girls, and for both more active and less active boys.

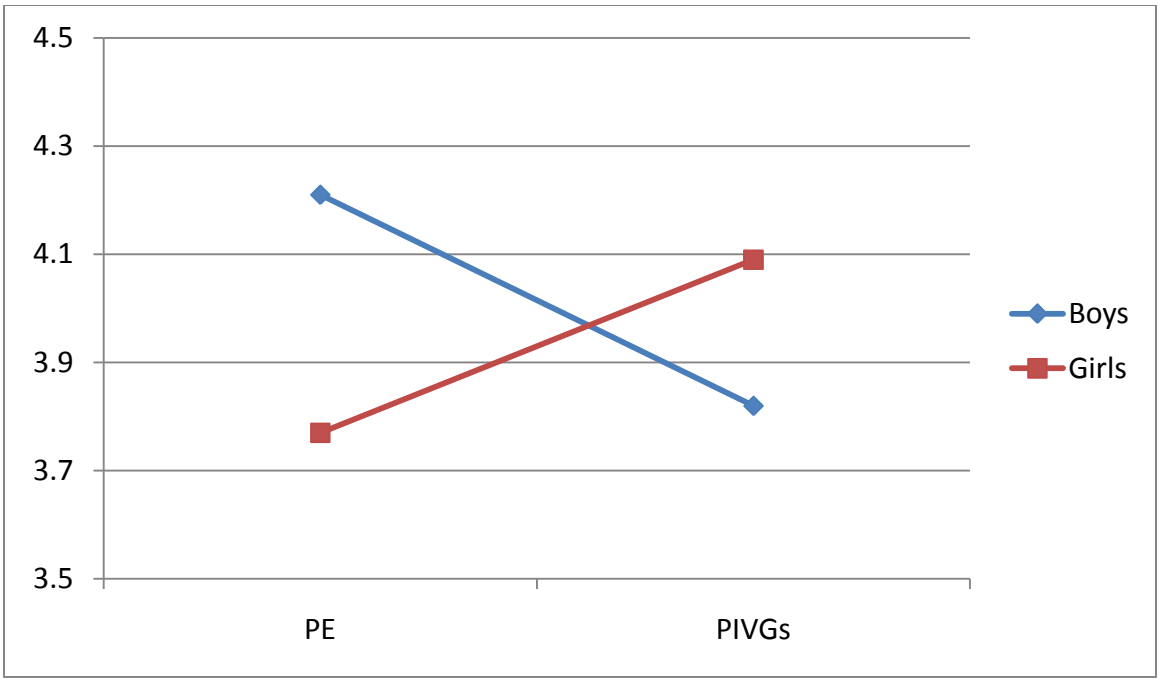

Figure 4: Gender by Type Interaction for Interest

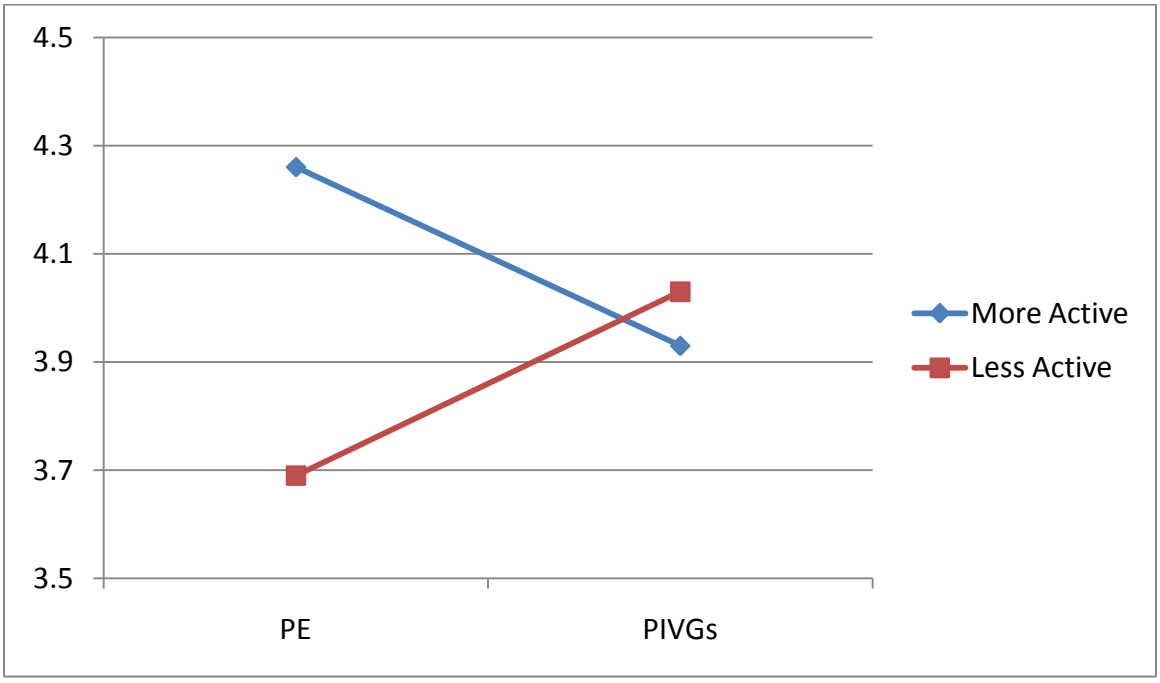

Figure 5: Activity Type by Activity Level Interaction for Interest

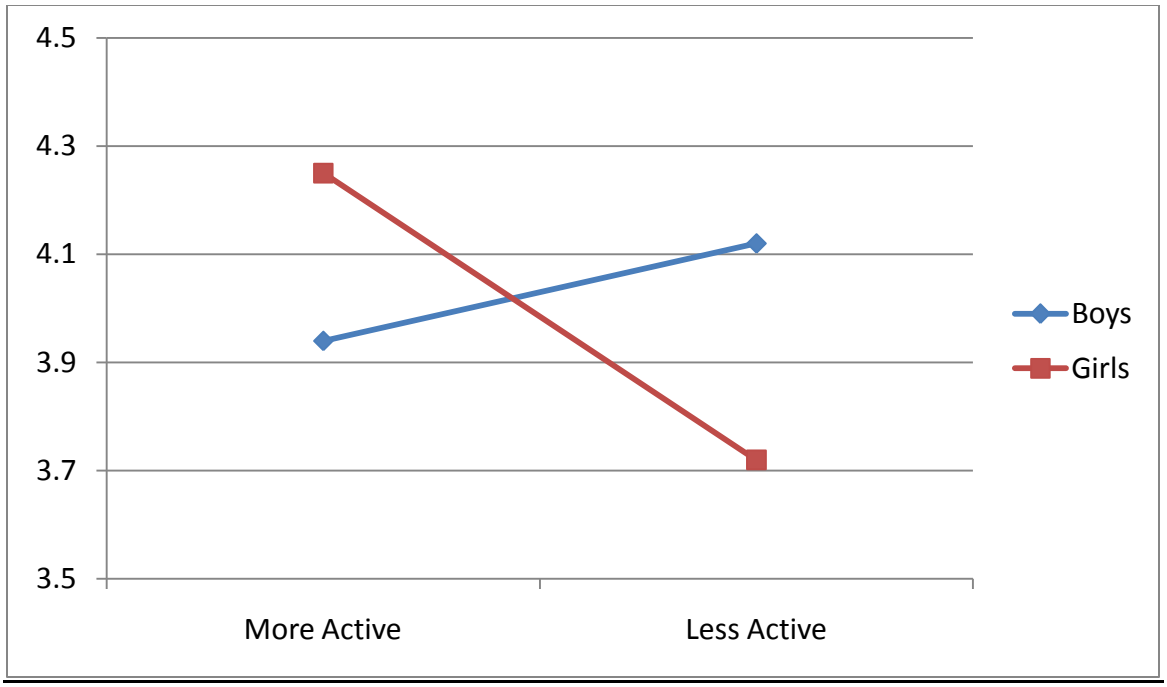

Figure 6: Activity Level by Gender Interaction for Overall Interest

Usefulness. The repeated measures ANOVA for utility value yielded a significant type of activity main effect [F (1, 97) = 14.30, p < .001]. As seen in Figure 7, students assigned higher usefulness to physical education than for PIVGs. The remaining main effects and interactions were not significant.

Intentions. The repeated measures ANOVA for intention for future participation yielded a significant main effect for gender [F (1, 97) = 4.65, p= .034], and a gender by type interaction [F (1, 97) = 24.38, p< .001]. As seen in Figure 8, boys had higher intention to take physical education in the future, while the opposite occurred for PIVGs, where girls had higher intention to use PIVGs in the future.

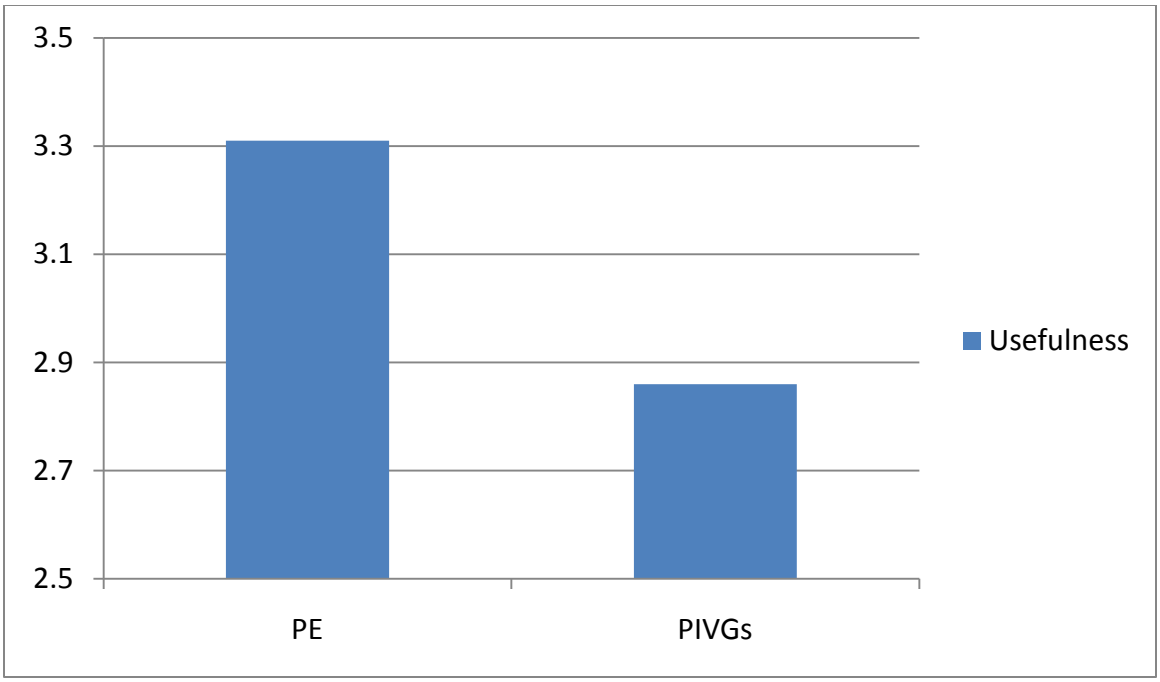

Figure 7: Usefulness

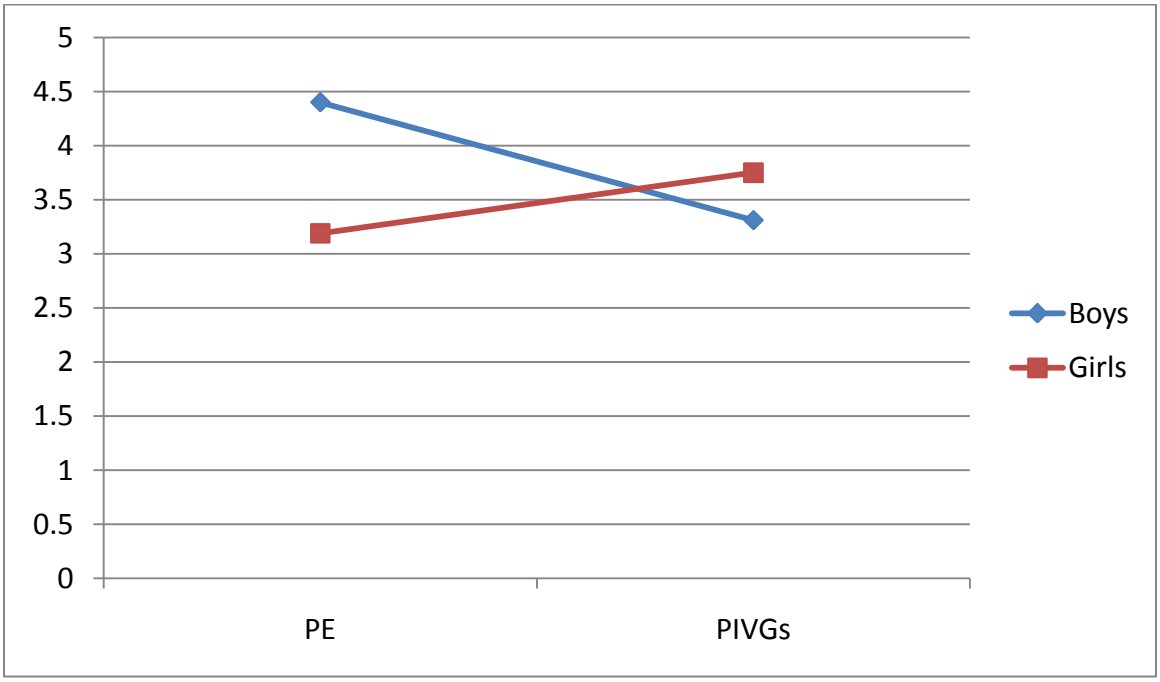

Figure 8: Intentions

DISCUSSION

The primary purpose of this study was to investigate the relationships among expectancy-related beliefs and task values for the domains of physical education and PIVGs. The theoretical constructs in the expectancy-value model of achievement choices and behaviors proposed by Eccles and her colleagues (1983), served as the bases for analyzing the participants' motivation. The applicability of this model to areas outside of academia has been well documented, and this current study is the first of its kind to apply this model to the context of PIVGs.

Comparison of Physical Education and PIVGs

The first hypothesis, that expectancy-related beliefs and task values would be positively related within the domains of physical education and PIVGs was supported. The pattern of relationships between expectancy-related beliefs and task values was similar for both the domains of physical education and PIVGs. Consistent with expectancy-value research in academics and physical education the results of this study demonstrated positive correlations between expectancy-related beliefs and task values (Jacobs et al., 2002; Gao et al., 2009). Expectancy-related beliefs and task values were also positively associated with intention to participate in the future. As Chen and colleagues (2008) pointed out, students' expectancies and values in physical education can be affected by the specific content being taught. Xiang and colleagues (2003) also argue even within a specific content physical education students can have different expectancies and values for specific activities or skills such as throwing. Students with higher expectancy-related beliefs had higher domain specific task values for both physical education and PIVGs, and higher expectancy-related beliefs and task values were associated

with future intentions to participate, which is consistent with the previous literature (Gao et al., 2009; Xiang et al., 2003, 2006).

With regard to the second hypothesis, the absence of correlations between expectancy-related beliefs and task values in physical education and PIVGs supports the prediction that PIVGs are a separate and distinct domain from traditional physical education activities. This is consistent with previous studies, such as Xiang et al. (2003), where expectancy-related beliefs and task values across physical education and throwing were distinct. The second part of this hypothesis, that expectancy-related beliefs and task values for PIVGs would be higher than those for physical education, was not supported. For the group as a whole, ability beliefs did not differ across domains, and expectancies for success were higher for physical education than for PIVGs. It is surprising that expectancies for success were higher in physical education, and this is a finding that calls for further investigation. It seems possible that success in physical education could be defined in terms of grades, which are often linked more to compliance (dressing out, following directions) than to performance based measures. Conversely, success in PIVGs may be more normative and based on skill, expertise, and performance and that could explain lower expectancies for success in that domain.

Although it was hypothesized that PIVGs would have higher task values than physical education, physical education was viewed as more important and more useful than PIVGs. This finding may suggest students view PIVGs or video games in general as purely fun or recreationally, and do not view PIVGs as important or useful in contributing to their overall fitness or health benefits. One implication from this finding is that teachers should consider

emphasizing the potential usefulness and importance of PIVGs when they incorporate them into their curricula. There was no overall difference in the interest levels or future intentions across domains. It is encouraging that these students found physical education to be more important and useful than PIVGs, but unfortunate that the values associated with physical education did not translate to stronger intentions for future participation.

Gender and Activity Levels

Gender and physical activity levels were the focus of the third and fourth hypotheses. The main effects and interactions that emerged provide valuable insight with regard to how PIVGs might be used to increase adolescents' physical activity levels. It was hypothesized that boys would have higher expectancy-related beliefs and task values than girls across both domains of physical education and PIVGs, and that hypothesis was not supported. The overall gender effects were not significant for expectancy-related beliefs or task values. There are several recent studies that also did not find meaningful overall gender differences in expectancy-related beliefs and task values in physical education students (Gao et al., 2009; Xiang et al. 2003, 2006). Data from this study, though, suggest that gender should still be a consideration in the investigation of ways to promote physical activity in physical education classes. There was a significant overall effect for intentions, with boys reporting higher intentions for future participation across domains. The significant type of activity by gender interaction suggests there is strong potential to use PIVGs to entice girls to be more active. Additionally, there was an overall main effect for gender across physical education and PIVG domains, with less active girls reporting lower levels of interest than more active girls, and for both more active and less active boys. Consistent with previous work (Jacobs et al., 2002; Xiang

et al., 2003), for physical education, girls had lower expectancies for success, less interest, and lower intentions for future participation than boys. In contrast, for PIVGs, girls compared more favorably to boys on these variables, suggesting that the disadvantages girls typically display in traditional physical education activities may not be evident in PIVGs.

Examining how these expectancy-related beliefs, task values, and intentions vary by self-reported activity level also yields valuable insight. It was hypothesized that more active students would have higher expectancy-related beliefs and task values in physical education than less active students, but that those differences would not be evident in PIVGs, and there is partial support for that hypothesis. More active students had higher ability beliefs and higher levels of interest than less active students in physical education, but ability beliefs and interest levels for those groups were similar for PIVGs.

Summary and Conclusions

Taken together, the findings from this study provide support for the notion that PIVGs could be incorporated into physical education and community recreation programs as a means to attract adolescents who are not currently active. These findings suggest PIVGs could be a useful tool in efforts to equalize the playing field so that all students in the physical education classroom believe they can participate and be successful. Creating a success oriented climate in the physical education classroom can lead to enhanced motivation (Solmon, 2003). Additionally, girls and less active students expressed higher levels of interest in PIVGs as compared to physical education. Chen and Ennis (2004) suggest that developing student interest is an important component in promoting motivation in physical education, and these

data suggest that using PIVGs is one way that physical education teachers could increase student interest for students who are at risk for physical inactivity. As the students motivation in physical education is increased this can lead to effective learning, which is the ultimate goal of any teacher.

In the current study only the general domains of physical education and PIVGs were used. Future research may include comparison of more specific activities or skill within physical education and its virtual counterpart for PIVGs. Additionally, exploring how ability and success are defined in the domain of PIVGs emerged as an area for further study.

The need for curriculum designers to appeal to all students in the physical education classroom is an issue of current importance. The results of this study suggest PIVGs offer a viable option to physical education teachers and planners. Research on motivation has revealed interest value as an important predictor of future motivation (Xiang et al., 2006). In this study, less active girls' overall interest was lower for both domains of physical education and PIVGs together. Future research is needed to find ways to motivate this specific population in the physical education classroom.

The impact of these findings can aid curriculum planner and physical education teachers in developing new methods and units that involve PIVGs. As technology grows and PIVGs become more readily available in the community and classroom, researchers must attend to scientifically evaluating the effectiveness of PIVGs, as well as evaluating their effect on students' motivation, as well as their fitness levels and engagement in physical activity. The major implications of this study have demonstrated how PIVGs have higher interest levels over

traditional physical education for girls and less active students who are often the populations victimized by traditional sport based athlete dominated physical education programs. The inclusion and involvement of all populations in a physical education program can create an environment where all students are motivated to be physically active for a lifetime.

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APPENDIX: QUESTIONNAIRES

SECTION 1

A) What is your age?	**11 12 13 14 Other:_____.**
B) What is your gender?	**Male Female**
C) How would you classify yourself?	**American Indian Asian/Pacific Islander Black/ African American Caucasian/White Multiracial Other:_____.**
D) How would you classify yourself?	**Hispanic Non-Hispanic**

SECTION 2

1. How good are you at activities and games in PE?	**1**	**2**	**3**	**4**	**5**
	Very bad				**Very good**
2. If you were to list all the students in your PE class from the worst to best, where would you put yourself?	**1**	**2**	**3**	**4**	**5**
	One of the worst				**One of the best**
3. Some kids are better in one subject than in another. For example, you might be better in mathematics than in reading. Compared to most of your other school subjects, how good are you at activities and games in PE?	**1**	**2**	**3**	**4**	**5**
	A lot worse in PE				**A lot better in PE**
4. How well do you think you will learn activities and games in PE this year?	**1**	**2**	**3**	**4**	**5**
	Not at all well				**Very well**
5. How good would you be at learning something new in PE?	**1**	**2**	**3**	**4**	**5**
	Very bad				**Very good**
6. For me, being good at activities and games in PE is…	**1**	**2**	**3**	**4**	**5**
	Not important				**Very important**
7. Compared to your other school subjects, how important is it to you to be good at activities and games in PE?	**1**	**2**	**3**	**4**	**5**
	Not very important				**Very important**
8. In general, I find learning new activities and games in PE is…	**1**	**2**	**3**	**4**	**5**
	"Way" boring				**"Way" fun**
9. How much do you like activities and games in PE?	**1**	**2**	**3**	**4**	**5**
	Don't like it at all				**Like it very much**
10. Some things that you learn in school help you do things better outside of class. We call this being useful. For example, learning about plants might help you grow a garden. In general, how useful is what you learn in PE?	**1**	**2**	**3**	**4**	**5**
	Not useful at all				**Very useful**

11. Compared to your other school subjects, how useful is what you learn in PE?	**1 2 3 4 5** **Not useful at all Very Useful**
12. When you get to high school, you will have a choice whether you want to take PE. How much would you want to take it?	**1 2 3 4 5** **Not at all Very much**

SECTION 3

13. How often do you play Physically Interactive Video Games?	**1 2 3 4 5** **Never Sometimes Very Often**
14. How good are you at Physically Interactive Video Games?	**1 2 3 4 5** **Very bad Very good**
15. If you were to list all the students in your PE class from worst to best for Physically Interactive Video Games, where would you put yourself?	**1 2 3 4 5** **One of the Worst One of the best**
16. Some kids are better in one activity than in another. For Example, you might be better at throwing than running. Compared to most of the other activities in PE, how good are you at activities and games in Physically Interactive Video Games?	**1 2 3 4 5** **A lot worse in Physically Interactive Video Games A lot better in Physically Interactive Video Games**
17. How well do you think you will learn activities and games in Physically Interactive Video Games?	**1 2 3 4 5** **Not at all well Very well**
18. How good would you be at learning something new in Physically Interactive Video Games?	**1 2 3 4 5** **Very bad Very good**
19. For me, being good at activities and games in Physically Interactive Video Games is…	**1 2 3 4 5** **Not important Very important**
20. Compared to other activities in PE, how important is it to you to be good at activities and games in Physically Interactive Video Games?	**1 2 3 4 5** **Not very Important Very important**
21. In general, I find learning new activities and games in Physically Interactive Video Games is…	**1 2 3 4 5** **"Way" boring "Way" fun**
22. How much do you like activities and games in Physically Interactive Video Games?	**1 2 3 4 5** **Don't like it at all Like it very much**
23. Some things that you learn in school help you do things better outside of class. We call	**1 2 3 4 5**

this being useful. For example, learning about plants might help you grow a garden. In general, how useful is what you learn in Physically Interactive Video Games?	**Not useful at all**				**Very useful**
24. Compared to other activities in PE, how useful is what you learn in Physically Interactive Video Games?	**1** **Not useful at all**	**2**	**3**	**4**	**5** **Very useful**
25. If you owned Physically Interactive Video Games. How much would you want to play it?	**1** **Not at all**	**2**	**3**	**4**	**5** **Very much**

1. During a typical 7-Day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number).

a) STRENUOUS EXERCISE (HEART BEATS RAPIDLY) (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)	**Times Per Week** _____
b) MODERATE EXERCISE (NOT EXHAUSTING) (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)	**Times Per Week** _____
c) MILD EXERCISE (MINIMAL EFFORT) (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking	**Times Per Week** _____

2. During a typical 7-Day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

1. Often _____ 2. Sometimes _____ 3. Rarely/Never _____

VITA

Andrew was born and raised in Sugar Land, Texas. There he enjoyed a childhood subjugated with sports. Graduating high school, he enrolled in Louisiana State University (LSU) in 2004. He was accepted into Pi Kappa Phi fraternity his freshman year and continued membership throughout his undergraduate program. His sophomore year Andrew was elected as the executive board member for philanthropic events, were he conducted two events that raised money for PUSH America. Throughout college, Andrew served as an assistant soccer coach at Dunham High School in Baton Rouge, Louisiana, for two seasons. Completing his undergraduate degree in kinesiology, with an emphasis on K-12 health and physical education certification in December of 2008, he was accepted to the LSU graduate school and began taking classes working toward his master's degree in kinesiology of January 2009. During his second semester of graduate school, Andrew accepted a graduate assistantship allowing him to become the project coordinator for the Geaux Heart Baton Rouge community outreach program. Studying under his major professor Dr. Melinda Solmon, Andrew began formulating his thesis in the fall of 2009. Andrew successfully defended his thesis in June of 2010 and will be awarded a Master of Science in kinesiology in August 2010.

Andrew's future plans include teaching science, health and physical education and coaching at Archbishop Rummel High School in Metairie, Louisiana. He plans to continue researching and implementing more effective ways to motivate young people to be physically active for a lifetime.