

7-3-2014

Young children's enjoyment of physical activity

Samantha Renae Hudson

Follow this and additional works at: <http://commons.emich.edu/theses>



Part of the [Medicine and Health Sciences Commons](#)

Recommended Citation

Hudson, Samantha Renae, "Young children's enjoyment of physical activity" (2014). *Master's Theses and Doctoral Dissertations*. 578.
<http://commons.emich.edu/theses/578>

This Open Access Thesis is brought to you for free and open access by the Master's Theses, and Doctoral Dissertations, and Graduate Capstone Projects at DigitalCommons@EMU. It has been accepted for inclusion in Master's Theses and Doctoral Dissertations by an authorized administrator of DigitalCommons@EMU. For more information, please contact lib-ir@emich.edu.

Young Children's Enjoyment of Physical Activity

by

Samantha R. Hudson

Thesis

Submitted to the School of Health Promotion and Human Performance

Eastern Michigan University

in partial fulfillment of the requirements

for the degree of

MASTER OF SCIENCE

in

Health Education

Thesis Committee:

Susan McCarthy, Ph.D., Chair

Joan Cowdery, Ph.D.

Michael Paciorek, Ph.D.

July 3, 2014

Ypsilanti, Michigan

Acknowledgments

First, I must thank my chair person, Dr. Susan McCarthy, and committee members, Dr. Joan Cowdery and Dr. Michael Paciorek. Dr. McCarthy's mentoring, understanding, time, and proficiency allowed this undertaking to be a pleasant learning and growing experience. The knowledge and guidance provided by Dr. Cowdery and Dr. Paciorek were invaluable to me during this process.

I would like to thank Cheyenne Shinabarger for all of her time and help with the statistical analysis of this project. Her expertise is greatly appreciated.

I would like to thank all of the Health Education faculty members at Eastern Michigan University. Their lessons and enthusiasm built the foundations for this study.

My thanks also go to the principal and kindergarten teachers at Village Oaks Elementary for their willing assistance with this project.

Finally, I would like to thank my husband, Joel Hudson, and parents, Robert and Tamara Smith, for their unconditional love, support, and encouragement.

Abstract

Young children are currently understudied in the area of physical activity enjoyment. Since young children lack the cognitive skills which motivate many adults to participate in physical activity, they have a unique need for specialized intervention programs. The present study explores how enjoyment of physical activity in young children is related to their actual levels of physical activity. Modified versions of the Physical Activity Enjoyment Scale (PACES) and the Physical Activity Questionnaire for Older Children (PAQ-C) were used to discover if such a relationship exists in kindergarten students from a multi-ethnic, suburban elementary school. While no significant correlation was found between self-reported physical activity level and overall enjoyment ($r(18)=.012$, $p=.963$), it was discovered that the participants in this study enjoy being physically active. These findings provide a basis to further investigate young children's enjoyment of physical activity.

Table of Contents

Acknowledgments.....	ii
Abstract.....	iii
Chapter 1: Introduction.....	1
Purpose of the Study	1
Significance of the Study	2
Research Questions.....	2
Delimitations, Limitations, and Assumptions.....	2
Operational Definitions.....	3
Chapter 2: Literature Review.....	4
The Importance of Physical Activity	4
Correlates of Physical Activity in Children	6
Self-Determination Theory and Children’s Enjoyment of Physical Activity	7
Children’s Physical Activity and Enjoyment of Physical Activity Survey Instruments ..	10
Chapter 3: Methodology	13
Participants.....	13
Instruments.....	14
Procedures.....	17
Data Analysis	17
Chapter 4: Results.....	19
Description of the Sample and Attrition	19
Survey Results	19
Survey Scores and Relationships	31

Chapter 5: Discussion	33
Summary of Procedures	33
Summary of Findings and Discussion	33
Limitations	36
Conclusions	37
Recommendations	37
References	39
Appendix A Human Subjects Initial Approval	49
Appendix B Human Subjects Minor Modification Approval Email	49
Appendix C Grade School Permission Email	51
Appendix D Parent/Guardian Informed Consent	52
Appendix E Actual Assent	56
Appendix F PAQ-C Modified Survey Assent and Script	57
Appendix G PACES Modified Survey Assent and Script	60
Appendix H Modified PAQ-C and Modified PACES Survey Response Sheet	61

List of Tables

<u>Table</u>		<u>Page</u>
1	Number of Times Activities were Performed in the Last Week.....	21
2	Frequencies of Modified PAQ-C Questions 2-9 Responses.....	26
3	Frequencies of Modified PACES Responses.....	29
4	Descriptive Statistics of modified PACES scores (n=19).....	31

Chapter 1: Introduction

Physical activity is an important part of a healthy lifestyle. Even aside from the obesity epidemic, regular physical activity for those who are at optimal weight is important for lifelong health. A number of chronic diseases could be prevented or minimized if the proper amount of physical activity was reached (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996). Physical activity is especially important for children not only because it is a protective factor against overweight, obesity, and related risk of chronic diseases (Tremblay & Williams, 2003; Veugelers & Fitzgerald, 2005), but also because it has been shown that physical activity attitudes and patterns in childhood predict physical activity when those children become adults (Telama et al., 2005; Thompson, Humbert, & Mirwald, 2003).

In order to create programs which will help children become more physically active, the multiple correlates behind children's physical activity need to be further studied and evaluated. Enjoyment of physical activity is one such correlate which can be fairly easily manipulated for young children. There has been some research about enjoyment of physical activity that has been done but almost exclusively in adults and adolescents (Moore et al., 2009). Enjoyment of physical activity in children may be a likely factor for intervention and may suit the nature of children much better than a cognitive-based approach.

Purpose of the Study

This study was concerned with physical activity in children. The purpose of this study was to determine if there is a relationship between enjoyment of physical activity and self-reported physical activity levels for kindergarten students in a diverse, suburban elementary school using a modified Physical Activity Enjoyment Scale (PACES; Moore et al., 2009) with self-determination theory as a theoretical framework. Enjoyment is known to be a correlate of

physical activity in older children and adolescents via the use of a modified PACES (Moore et al., 2009; Motl et al., 2001). This study also used a modified PACES to examine intrinsic motivation, a major component of self-determination theory, and its relationship with physical activity level.

Significance of the Study

Enjoyment of physical activity has yet to be correlated with levels of physical activity in children under 8 years of age using a measure consisting of more than one or two items. A modified version of the PACES provided a promising way of measuring physical activity enjoyment in kindergarten children. The ability to correlate physical activity enjoyment with self-reported physical activity levels could open up the possibility for physical activity intervention programs to begin at younger ages.

Research Questions

This research sought to find answers to the following questions:

- What is the relationship, if any, between overall enjoyment of physical activity and self-reported physical activity levels for kindergarten students in a diverse suburban elementary school using a modified PACES scale?
- What is the relationship, if any, between intrinsic motivation and self-reported physical activity levels for kindergarten students in a diverse suburban elementary school using a modified PACES scale?

Delimitations, Limitations, and Assumptions

Participants were from a convenience sample of approximately 100 kindergarten students attending a multiethnic and suburban elementary school in the Midwest. Participation was dependent on both parental and participant permission being granted. Due to the low number of participants, results cannot be generalized to other kindergarten students. The main survey used

in this study was a modified version of the PACES and had not been tested in young children attending kindergarten. However, variations of PACES have shown validity and reliability in children as young as 8 years old (Moore et al, 2009). While special care was taken to phrase the items on the modified PACES and modified Physical Activity Questionnaire for Older Children (PAQ-C) instruments according to the comprehension level of kindergartners and to avoid showing preference for any of the possible responses, the nature of self-report data necessitates that the researcher must assume the participants are truthful. There are also nearly countless reasons why people participate in physical activity. While this study sought to isolate questions relating to enjoyment, researchers can never truly know the level of influence confounding factors might have on each individual.

Operational Definitions

1. Physical Activity Enjoyment Scale (PACES) – A survey instrument used to measure one’s enjoyment of physical activity, (Kendzierski & DeCarlo, 1991).
2. Physical Activity Questionnaire for Older Children (PAQ-C) – A survey instrument used to measure the amount of physical activity performed during the past week, (Kowalski, Crocker, & Donen, 2004).
3. Self-Determination Theory – A metatheory approach to understanding human behaviors and motivations with overarching constructs of three basic psychological needs: feelings of competence, autonomy, and relatedness. The theory postulates that if these needs are adequately satisfied, an individual’s behavior will be based on intrinsic motivations rather than external, or extrinsic, motivations or factors, (Deci & Ryan, 2000).

Chapter 2: Literature Review

Physical activity is a significant contributor to health and well-being. Research about why physical activity is so important and what motivates people to participate in it has been evolving to reflect the needs of populations. Understanding the interplay of young children's levels of physical activity and their enjoyment of physical activity is one of the most recent subtopics beginning to be explored.

The Importance of Physical Activity

Chronic diseases. According to the U.S. Surgeon General's report on the effects of physical activity on health and disease, physical activity has been found to have positive correlations to prevention, delays, or reversing of the following health conditions and chronic diseases: overall mortality, coronary heart disease, hypertension, colon cancer, type II diabetes, osteoarthritis, osteoporosis, obesity, unfavorable body fat distribution, and symptoms of depression and anxiety (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996).

Although specific guidelines for amounts of physical activity needed to maintain a healthy life varies among organizations, it has been documented that a complete lack of physical activity is detrimental to health (Blair, LaMonte, & Nichaman, 2004). Physical inactivity is known to contribute to those many chronic diseases which typically present in adulthood. In adults, there is not only a relationship between physical inactivity and type 2 diabetes, osteoporosis, obesity, and overweight, but the relationship is a causal one (Bauman, 2004).

Physical activity is a protective factor for many types of cancer (Anderson, Ross, & Folsom, 2004; Calton et al., 2006; Lee, 2003; Magnusson et al., 2005; Margolis et al., 2005; Miles, 2007; Patel et al., 2005; Samad, Taylor, Marshall, & Chapman, 2004; Schouten,

Goldbohm, & van den Brandt, 2004; Tehard, Friedenreich, Oppert, & Clavel-Chapelon, 2006; Torti, & Matheson, 2004; & Wei et al., 2003), coronary heart disease, type II diabetes, stroke, and all cause mortality, (Bassuk & Manson, 2005; Bauman, 2004; Hankey, 2006; Hu et al., 2004; Warburton, Nicol, & Bredin, 2006; Weinstein et al., 2004; Wendel-Vos et al., 2004). Physical inactivity is a risk factor for hypertension, symptoms of depression and anxiety, and osteoporosis (Garret, Brasure, Schmitz, Schultz, & Huber, 2004; Strine, et al., 2008).

While many chronic diseases are not fully recognized until adulthood, physical activity can act as a protective factor for children against overweight and obesity (Tremblay & Williams, 2003; Veugelers & Fitzgerald, 2005). The current obesity epidemics in both children and adults have shown the enormous detriments that overweight and obesity can have on health throughout the lifespan.

Linking childhood physical activity to adult physical activity. It has been assumed that there are links between childhood physical activity and corresponding adult physical activity. It is important to confirm that there really are correlations so that policy makers and health educators have solid evidence to emphasize the importance of physical activity for children. There are a moderate number of studies demonstrating that there are in fact associations between childhood and adult physical activity patterns. Recently, these studies have shown stronger associations and offer even more insight into possible predictive physical activity behaviors. Results from a 21-year longitudinal study showed that “physical activity from age 9 to age 18 significantly predicted adult physical activity” (Telama et al., 2005, p. 271). Telama et al. (2005) also found that the type of physical activity in youth does not predict the amount of physical activity in adulthood but that if the physical activity lasts for many years in youth (continuous physical activity) there is a higher probability that an individual will be more physically active in adulthood. Similarly, Thompson et al. (2003) discovered through a

retrospective study that positive and negative physical activity experiences in childhood correlate to adult physical activity attitudes and behaviors. Development of skills in a fun manner (regardless of sport or activity) was the strongest independent predictor of future adult physical activity behaviors (Thompson et al., 2003). It is clear that the level of physical activity in children needs to be increased. A review by Hills, King, and Armstrong (2007) reminds researchers and intervention planners that there are many factors to consider in attempting to study or increase the level of physical activity in children.

Correlates of Physical Activity in Children

Physical activity in children is a complex behavior. Regardless of what is currently known about how to increase children's physical activity levels, the activity patterns can be very influential to long-term health. There are many correlates which help to determine whether a child will engage in physical activity. While each type of correlate affects a portion of a child's physical activity, the combination of correlates must always be taken into account when assessing it.

Demographic. Age, sex, ethnicity, education level of parents, and socioeconomic status are well known to be independently correlated to children's physical activity (Goodway & Smith, 2005; Heitzler, Levin Martin, Duke, & Huhman, 2006). Demographic variables are not easily changed and they are certainly not things that a child has any control over.

Environmental. Frequency, duration, intensity, and quality of physical education programs; safety; and seasonal weather conditions are some environmental correlates commonly related to children's physical activity or the lack thereof (Kohl & Hobbs, 1998). Transportation and access to facilities or programs providing opportunities to be physically active are also environmental factors correlated to children's physical activity levels (Sallis, Prochaska, &

Taylor, 2000). Most environmental correlates of physical activity are not modifiable by children themselves or even those who may have the most influence on them.

Psychosocial. Psychosocial correlates of physical activity in children are diverse social and psychological factors that can include things such as beliefs, mood, and social support. There are numerous studies providing evidence for correlations between many psychosocial variables and children's physical activity. Welk & Schaben (2004) found in their review that "The variance in children's physical activity behavior accounted for by batteries of psychosocial correlates has generally ranged between 6% and 30% with most values around 20% - 25%" (p. 64). These percentages reflect the large portion of potentially modifiable correlates which could, in turn, lead to increased physical activity levels in children. Self-determination theory provides an excellent framework for understanding one of these psychosocially-modifiable variables: children's enjoyment of physical activity.

Self-Determination Theory and Children's Enjoyment of Physical Activity

Self-determination theory is a metatheory approach to understanding human behaviors and motivations with overarching constructs of three basic psychological needs: feelings of competence, autonomy, and relatedness. The theory postulates that if these needs are adequately satisfied, an individual's behavior will be based on intrinsic motivations rather than external, or extrinsic, motivations or factors (Deci & Ryan, 2000). Feelings of competence are one's beliefs that he or she can satisfactorily perform the tasks or skills necessary in a behavior. This is also sometimes called "perceived competence." Feelings of autonomy are one's beliefs that he or she is in charge of the decisions to perform a behavior. Feelings of relatedness is the construct which states that intrinsic motivation is more likely to occur when interpersonal relationships provide a strong sense of security and caring to the individual performing a behavior. This construct is the least important of the three as it has been documented that many people can happily perform

tasks in isolation. However, it is emphasized that relatedness provides an important backdrop for the performance of many volitional behaviors (Ryan & Deci, 2000).

Much research that has been done under the guidance of other health behavior theories points to the strength of self-determination theory and its main components. Heitzler et al. (2006), on the foundations of social cognitive theory and the theory of planned behavior, found that 9 to 13 year olds' positive outcome expectations about participating in physical activity, such as physical activity being regarded as fun and as a platform on which to form new friendships, are related to both organized and free-time physical activity. That same study has also shown that children's perceptions of what their parents think about participating in physical activity actually have a rather strong impact on physical activity levels as well (Heitzler et al., 2006). Though also based on the social ecological model, research of twenty-five 10 to 12 year-olds given very similar opportunities to be active suggests that the social cognitive theory aspect of perceived athletic competence has a higher correlation ($r=.72$) to children's physical activity behaviors than previously believed (Welk & Schaben, 2004). Barrett (2001) reiterates the previous social cognitive theory-based finding that a child's confidence in his or her abilities is strongly predictive of adolescent physical activity levels and suggests that "...self-efficacy can best be enhanced by using a gradual approach to building mastery of physical skills and increasing the likelihood of success. Success is more likely to occur when children are allowed to choose their challenge level in an activity" (p. 36). A study among fifth and eighth graders (Craig, Goldberg, & Dietz, 1996) based on the theory of planned behavior found that attitude significantly predicted the intent to participate in physical activity, perceived behavioral control significantly predicted children's intent to participate in vigorous activity, and a child's perception of how good she or he was at vigorous activity predicted perceived behavioral control. Taking the findings of these studies together shows the importance of the three basic

psychological needs of competence, autonomy, and relatedness in the likelihood of children engaging in physical activities.

Going a step further, it has been emphasized that promoting children's physical activity needs to be done in a manner that encourages play and makes the activity the most fun and enjoyable that it can be (Barrett, 2001; Burdette & Whitaker, 2005; Craig et al., 1996; DiLorenzo, Stucky-Ropp, Vander Wal, & Gotham, 1998). In the studies that attempted to quantify it, enjoyment has been found to be a very strong predictor of both intent to engage and actual participation in physical activity, especially when coupled with measures that promote high levels of self-efficacy (Craig et al. 1996; DiLorenzo et al., 1998).

As self-determination theory has been gaining acceptance in the research and educational communities as of late, it has begun to be used as a stand-alone theoretical framework for enjoyment of physical activity. Murcia, de San Román, Galindo, Alonso, and González-Cutre (2008) and Yli-Piipari, Watt, Jaakkola, Liukkonen, and Nurmi (2009) both provide strong, relevant support for the use of a self-determination theory-based framework for investigating enjoyment of physical activity.

Self-determination theory even at the most broad level of understanding is an excellent resource to categorize behaviors on a continuum of motivation (amotivated to extrinsically motivated to intrinsically motivated) and to use those findings to develop interventions. It incorporates many of the time-tested constructs of other health behavior theories into a metatheory that makes sense for almost all volitional behaviors, especially for young individuals. The aim should be to have young children's physical activity nearly 100% intrinsically motivated since there is no serious cognition involved in the decision-making process. The behavior, therefore, would be done out of sheer enjoyment of the activity (intrinsic motivation) and much more likely to become a life-long habit.

Children's Physical Activity and Enjoyment of Physical Activity Survey Instruments

Children's physical activity levels and the PAQ-C instrument. The Physical Activity Questionnaire for Older Children (PAQ-C; Kowalski et al., 2004) is a survey instrument used to measure children's levels of physical activity. The PAQ-C has 10 multiple choice questions about participation in physical activities over the last seven days and is scored on a low to high activity scale from 1 to 5. The PAQ-C has been found reliable for use with children as young as 9 years old (Crocker, Bailey, Faulkner, Kowalski, & McGrath, 1997) and valid for use with children as young as 8 years old, (Kowalski, Crocker, & Faulkner, 1997). This study used the PAQ-C with minor changes to fit the nature of a verbal survey for kindergarten students.

Children's enjoyment of physical activity and the PACES scale. Enjoyment of physical activity has been repeatedly documented to have a positive association with physical activity (Bauman, Sallis, Dzewaltowski, & Owen, 2002; Boyd & Yin, 1996; DiLorenzo et al., 1998; Sallis et al., 2000; Sallis, Prochaska, Taylor, Hill, & Geraci, 1999; Trost et al., 2002; Williams, Anderson, & Winett, 2005). Prior to 1991, any measurement of enjoyment of physical activity was gathered from only one or two items on a multi-component scale. Kendzierski and DeCarlo (1991) were the first to develop a scale solely investigating one's enjoyment of physical activity. Pilot testing and two initial studies resulted in the preliminary reliability and validity of the Physical Activity Enjoyment Scale (PACES) for college-age students. This original instrument consists of 18 bipolar statements of various aspects of physical activity enjoyment rated on a continuum from 1 to 7. A study by Heesch, Masse, and Dunn (2006) reconfirmed the construct validity of the PACES for use in adults, and Mullen et al. (2011) found that an 8-item version of the PACES "is invariant across groups and time in a sample of community-dwelling older adults" (p. 110).

Studies have recently determined the usefulness of the PACES or modified versions of the PACES when measuring enjoyment of adolescents' and children's physical activity. Motl et al. (2001) demonstrated the construct validity and predictive validity of PACES among eighth-grade girls using a 5-point, Likert-type scale. Using the same instrument, Dishman et al. (2005) found that an increase in physical activity among eighth and ninth-grade girls was partially explained by increased scores of factors influencing enjoyment of physical education. Paxton et al. (2008) provided evidence that a modified version of PACES (S-PACES) has both multicultural relevance and invariance between genders and across time. Moore et al. (2009) examined the validity of a version of PACES for children younger than 12 years of age and their findings suggest structural validity and internal consistency for use of the PACES with third-grade children. Lawman, Wilson, Van Horn, Resincow, and Kitzman-Ulrich (2011) used a slightly modified version of PACES with underserved sixth graders and the nine positively-worded items showed good reliability. Recent translations into Italian (Carraro, Young, & Robazza, 2008) and German (Jekauc, Voelkle, Wagner, Mewes, & Woll, 2013) have found the PACES to have appropriate factor structure and reliability as well as to be valid and reliable, respectively. An Italian study based on the new translation has even found a high correlation coefficient ($r=.80$) between enjoyment of physical activity and intrinsic motivation scores in sixth and eighth grade girls (Labbrozzi, Robazza, Bertollo, Bucci, and Bortoli, 2013).

Past research has proven that physical activity is an important component of a healthy lifestyle. Enjoyment has been repeatedly documented as an important modifiable variable in individuals' physical activity. The development and modifications of the PACES is a step toward understanding one of the psychosocial components of physical activity levels in children. With further research, more interventions based on increasing enjoyment of physical activity could increase the physical activity levels of our youth. For this to be accomplished, a version of

the PACES needs to be tested on all segments of the youth population. The purpose of this study is to determine if there is a relationship between physical activity levels and enjoyment of physical activity in young children who are kindergarten students.

Chapter 3: Methodology

This study examined the possibility of a relationship between kindergarten students' enjoyment of physical activity and their actual physical activity levels using modified PACES and modified PAQ-C instruments. The study is based on the self-determination theory's main principle of intrinsic motivation as a key component to identifying young children's enjoyment of physical activity.

The research protocol was reviewed and approved by the College of Health and Human Services Human Subjects Review Committee at Eastern Michigan University (See Appendix A). Subsequently, minor modifications to the wording of some survey questions and a request to include a pilot study were also approved by the College of Health and Human Services Human Subjects Review Committee at Eastern Michigan University (See Appendix B). Permission from the grade school to conduct the study with the kindergarten students was granted by the school's principal (See Appendix C).

Participants

This study, which took place in the spring of 2011, had a convenience sample of approximately 100 kindergarten students from a suburban elementary school in the Midwest. The ethnic composition of the school consisted of 60.77% white, 19.83% Asian, 14.50% African American, 2.35% two or more races, and 2.56% American Indian, Hispanic, or Hawaiian (Michigan Department of Education, 2014). Each of the school's four kindergarten teachers received an informed consent document to send home with each student (See Appendix D). Thirty-three consent forms were returned, of which 30 parents/guardians consented to their child(ren)'s participation in the study. From these 30 students, three were randomly selected from one classroom to participate in a pilot study of the survey questionnaires. The pilot study confirmed the students' ability to comprehend the basic premise of the survey items and aided in

the final survey administration process by identifying the need to occasionally supplement the verbal questions with further explanatory words based on the students' body language. Of the 27 remaining students eligible to participate in the actual study, two were ill and not at school the days of the survey administration and one opted to not participate when the teacher gave the students the choice to go take the survey in the hall with the principle investigator. There were 24 students who listened to the assent script (See Appendix E). Three of those students immediately opted out of the study after listening to the assent, and one student elected to discontinue the survey after answering just one question. Twenty students answered a majority of the questions.

Instruments

First, physical activity levels were assessed using a modified version of the Physical Activity Questionnaire for Older Children (PAQ-C; Kowalski et al., 2004; See Appendix F). The PAQ-C has been found reliable for use with children as young as 9 years old (Crocker et al., 1997), and valid for use with children as young as 8 years old (Kowalski et al., 1997). The modified PAQ-C is a 9-item questionnaire which asks general, multiple choice questions about participation in physical activities over the last seven days. For the purpose of this study, some of the questions from the original PAQ-C had to be omitted or modified. A majority of the modifications were slight wording changes to fit the nature of a verbal survey for kindergarten students. Six activities were omitted from the multiple-component Question 1 (aerobics, badminton, skateboarding, street hockey, floor hockey, and cross country skiing) due to comprehension concerns or seasonal availability of the activity. A question regarding physical activity during lunch was omitted because students at this school were not allowed up from the table until lunch was over. A question regarding amount of physical activity for each day of the previous week was omitted due to comprehension concerns. A question about being sick or

anything else preventing normal physical activities was broken into two questions (items 8 and 9) to aid in verbal survey administration.

Each question on the modified PAQ-C (with the exceptions of Questions 8 and 9) is scored on a scale between 1 and 5 where 1 indicates the lowest level of activity and 5 is the highest. (Question two starts at “2” for scoring because the item that would normally score “1” is not a choice at the school where the survey was administered.) For Question 1, a composite score is determined for each student from the 17 to 19 possible activities. The composite score of Question 1 is then combined with the scores from Questions 2 through 7 to get the average, or activity score, for each participant. Questions 8 and 9 can be used to identify students who may have had unusually low physical activity levels during the last week, but cannot be used in determining the activity score.

Upon administration of the survey, it was discovered that there was no allotted place for an answer of “0” on the survey response sheet for Questions 4, 5, and 6 as well as for any of the 17 listed physical activities of Question 1. “0” was simply written next to the answer choice of “1” when “0” was indicated for an answer. While this error did not negatively impact the survey administration or study results, it will be important that any future use of this modified PAQ-C instrument survey response sheet have the “0” choice listed.

A modified version of the Physical Activity Enjoyment Scale (PACES) by Moore et al. (2009) was developed for this study and used to measure the enjoyment of physical activity. (See Appendix G). This developed instrument was sent to PACES instrument experts and self-determination theory experts to assess its content validity and the recommended changes were made according to their advice. All of the items (either borrowed from the instrument of Moore et al. (2009) or developed by the principle investigator) were designed to investigate overall enjoyment first and foremost. The final questionnaire consisted of the stem “When I am

physically active,” and proceeded with 18 statements related to various aspects of enjoyment of physical activity.

Of the 18 statements in the instrument developed for this study, 15 statements (statements 1-9 and 11-16) are comparable to the 16 statements from Moore et al. (2009). Statements 3, 4, 14, 15, and 16 are similar to those from Moore et al. (2009) but wordings were modified slightly to account for comprehension abilities of kindergarten students. One statement from Moore et al. (2009), “When I am physically active, I get something out of it” was removed due to comprehension concerns. Of the comparable 15 statements, 11 (statements 1-5, 8, and 11-15) also measured the self-determination theory construct of intrinsic motivation and statement 16 also measured the self-determination theory construct of autonomy. Three additional statements were created by the principle investigator and added to the instrument to address the self-determination theory constructs of competence (statement 18) and relatedness (statements 10 and 17). The changes to the instrument by Moore et al. (2009), along with the additional items developed to measure self-determination theory may have altered the validity of the Moore et al. (2009) instrument. A future study will need to be done to assess the validity of the modified instrument developed in this study.

Each of the 18 statements was measured with a simplified three-point Likert-type scale for easier comprehension (De Civita et al., 2005). Each item was scored on a scale of 1 to 3 with 1 being a low level of enjoyment and 3 being a high level of enjoyment. A composite score of the 18 statements determined each participant’s overall enjoyment score. An average score of the 11 statements measuring intrinsic motivation (statements 1-5, 8, and 11-15) also gave an intrinsic motivation score from 1 to 3.

Procedures

The information of risk/parental consent form went home to the parents/guardians through a folder system already in use at the school. Consent for students to participate in the study was obtained from the parents/guardians returning a signed portion of the information of risk/consent form. The students were asked for their assent verbally on the day they took the survey when they were taken into the hall in groups of three. They completed the verbally-administered survey by giving verbal answers and holding up their fingers or different colored sheets of paper indicating different answer choices. There were simple physical dividers between each student so that his or her answers were not seen or heard by classmates. The principle investigator was the only one who saw, heard, and recorded each student's answers on the response sheet (See Appendix H). The students were given thorough instructions and some explanations for more difficult words prior to taking the survey and also had the opportunity to ask for clarification at any time. Immediately after each small group of students completed the survey, each student's corresponding response sheet was slipped into a locked box that was only unlocked when all participants completed the survey. The principle investigator was the only person who had the ability to unlock the box and analyze the data.

Data Analysis

The Statistical Package for the Social Sciences (SPSS; Version 20.0) was used to run frequency analyses and correlations to determine whether there was a significant relationship between enjoyment of physical activity and self-reported physical activity levels in kindergarten students using the composite scores from the modified PACES questionnaire and the modified PAQ-C questionnaire. Analysis was also done to see if a relationship exists between self-reported physical activity levels and the intrinsic motivation component of self-determination theory. All statistical testing was completed using an alpha level of 0.05. Due to some missing

data points, Microsoft Excel was used prior to imputing the data into SPSS to average the participants' activity scores (PAQ-C) as well as the PACES overall enjoyment scores and intrinsic motivation scores.

Chapter 4: Results

This study utilized self-report data from surveys measuring participants' physical activity levels (modified PAQ-C) and enjoyment of physical activity (modified PACES). Demographic characteristics, survey response counts, and survey scores are reported in this chapter. Additionally, statistical analysis of the survey scores answer the two research questions posed in this study.

Description of the Sample and Attrition

Of the approximately 100 students invited to participate in the actual study (excluding pilot study participants), 24 had parent/guardian permission to participate and listened to the assent script. Three participants of the 24 immediately opted out of the study after listening to the assent and one participant elected to discontinue the surveys after answering just one question. Twenty participants answered a majority of the questions and were included in the analysis of results. Modified versions of the PAQ-C and PACES instruments were completed in entirety by 17 participants. In general, the participants were six years old (70%). Males accounted for 55% of participants while females made up 45%.

Survey Results

Modified PAQ-C Question 1. The first question of the modified PAQ-C consisted of 17 physical activities. The participants indicated how many times in the past week they had performed each physical activity. Riding a bicycle, running, and playing at a playground or park were the top three responses with at least 75% of participants performing one or all three of these activities at least once in the past week. Fifty percent of participants reported riding a bicycle five or more days in the past week while 25% reported riding a bicycle seven or more times. There was also the option for the participants to list up to two additional physical activities if they were not mentioned as one of the previous 17. The additional activities reported by

participants were karate, tennis, and motion-controlled video games. Table 1 provides the frequencies of the activities from the modified PAQ-C Question 1.

Table 1
Number of Times Activities were Performed in the Last Week

Activity	Times Performed	(n)	(%)
Skipping		(n=19)	
	0	9	47.37
	1	2	10.53
	2	3	15.79
	3	0	0.00
	4	0	0.00
	5	1	5.26
	6	0	0.00
Canoeing/Rowing	7	4	21.05
		(n=20)	
	0	18	90.00
	1	2	10.00
	2	0	0.00
	3	0	0.00
	4	0	0.00
	5	0	0.00
Roller Skating/ Rollerblading	6	0	0.00
	7	0	0.00
		(n=20)	
	0	9	45.00
	1	7	35.00
	2	1	5.00
	3	0	0.00
	4	0	0.00
Playing Tag	5	2	10.00
	6	0	0.00
	7	1	5.00
		(n=20)	
	0	6	30.00
	1	7	35.00
	2	3	15.00
	3	1	5.00
Walking	4	0	0.00
	5	2	10.00
	6	1	5.00
	7	0	0.00
		(n=20)	
	0	10	50.00
	1	5	25.00
	2	1	5.00
3	1	5.00	
4	1	5.00	
5	0	0.00	
6	0	0.00	
7	2	10.00	

Table 1 (Continued)
Number of Times Activities were Performed in the Last Week

Activity	Times Performed	(n)	(%)
Bicycle		(n=20)	
	0	3	15.00
	1	4	20.00
	2	2	10.00
	3	1	5.00
	4	0	0.00
	5	3	15.00
	6	2	10.00
	7	5	25.00
Running		(n=20)	
	0	4	20.00
	1	6	30.00
	2	3	15.00
	3	0	0.00
	4	0	0.00
	5	3	15.00
	6	0	0.00
	7	4	20.00
Swimming		(n=20)	
	0	13	65.00
	1	3	15.00
	2	1	5.00
	3	2	10.00
	4	1	5.00
	5	0	0.00
	6	0	0.00
	7	0	0.00
Baseball/Softball		(n=20)	
	0	14	70.00
	1	6	30.00
	2	0	0.00
	3	0	0.00
	4	0	0.00
	5	0	0.00
	6	0	0.00
	7	0	0.00
Dance		(n=20)	
	0	7	35.00
	1	7	35.00
	2	3	15.00
	3	1	5.00
	4	0	0.00
	5	1	5.00
	6	0	0.00
	7	1	5.00

Table 1 (Continued)
Number of Times Activities were Performed in the Last Week

Activity	Times Performed	(n)	(%)
Football		(n=20)	
	0	13	65.00
	1	3	15.00
	2	1	5.00
	3	0	0.00
	4	1	5.00
	5	1	5.00
	6	0	0.00
Soccer	7	1	5.00
		(n=20)	
	0	6	30.00
	1	5	25.00
	2	2	10.00
	3	1	5.00
	4	1	5.00
	5	1	5.00
Volleyball	6	1	5.00
	7	3	15.00
		(n=20)	
	0	13	65.00
	1	4	20.00
	2	1	5.00
	3	2	10.00
	4	0	0.00
Basketball	5	0	0.00
	6	0	0.00
	7	0	0.00
		(n=20)	
	0	9	45.00
	1	3	15.00
	2	3	15.00
	3	1	5.00
Ice Skating	4	0	0.00
	5	3	15.00
	6	0	0.00
	7	1	5.00
		(n=20)	
	0	18	90.00
	1	2	10.00
	2	0	0.00
3	0	0.00	
4	0	0.00	
5	0	0.00	
6	0	0.00	
7	0	0.00	

Table 1 (Continued)
Number of Times Activities were Performed in the Last Week

Activity	Times Performed	(n)	(%)
Hockey		(n=20)	
	0	19	95.00
	1	0	0.00
	2	1	5.00
	3	0	0.00
	4	0	0.00
	5	0	0.00
	6	0	0.00
Playground/Park		(n=20)	
	0	5	25.00
	1	6	30.00
	2	2	10.00
	3	1	5.00
	4	1	5.00
	5	1	5.00
	6	0	0.00
Karate		(n=3)	
	0	0	0.00
	1	2	66.67
	2	1	33.33
	3	0	0.00
	4	0	0.00
	5	0	0.00
	6	0	0.00
Tennis		(n=3)	
	0	0	0.00
	1	1	33.33
	2	1	33.33
	3	1	33.33
	4	0	0.00
	5	0	0.00
	6	0	0.00
Motion-Controlled Video Games		(n=4)	
	0	0	0.00
	1	1	25.00
	2	0	0.00
	3	1	25.00
	4	0	0.00
	5	1	25.00
	6	0	0.00
7	1	25.00	

Modified PAQ-C Questions 2 through 9. Modified PAQ-C Questions 2 through 7 asked about quantity and quality of various opportunities to be physically active in the past week. Question 2 revealed that 70% of participants reported being “active a lot of the time” or “active the whole time” in gym class. Question 3 revealed that 90% of participants reported “running around or playing a lot” or “running around or playing hard the whole time” during outdoor recess. The most popular answer for Question 4, the number of “days right after school” that participants were very active, was “3 days” (40%), while the most common answers for the number of evenings (Question 5) and the number of times on the last weekend (Question 6) that participants were very active were “0 days” (31.58%) and “1 time” (31.58%), respectively. Question 7, the final question used to calculate each participant’s modified PAQ-C Activity Score, revealed that nearly all participants reported spending at least some of their free time doing active things, while only 10.53% reported spending almost all of their free time doing sitting down activities. Question 8 showed that most participants reported that they were not sick (89.47%) during the past week. Most participants reported in Question 9 that they were not kept from their normal physical activities (73.68%) during the past week either. Table 2 provides frequencies of the responses from Questions 2 through 9 of the modified PAQ-C.

Table 2
Frequencies of Modified PAQ-C Questions 2-9 Responses

Item	Response	(n)	(%)
The last time you had gym class at school, how often were you very active?		(n=20)	
	Just a little bit active	0	0.00
	Active some of the time but not all of it	6	30.00
	Active a lot of the time	6	30.00
	Active the whole time	8	40.00
In the last week what did you do most of the time when you had outdoor recess?		(n=20)	
	Mostly sitting down	0	0.00
	Mostly standing or just walking around	0	0.00
	Running around or playing a little bit	2	10.00
	Running around or playing a lot	10	50.00
	Running around or playing hard the whole time	8	40.00
In the last week on how many days right after school did you do sports, dance, or play games in which you were very active?		(n=20)	
	0 Days	4	20.00
	1 Day	3	15.00
	2 Days	2	10.00
	3 Days	8	40.00
	4 Days	1	5.00
	5 Days	2	10.00
In the last week on how many evenings did you do sports, dance, or play games in which you were very active?		(n=19)	
	0 Days	6	31.58
	1 Day	2	10.53
	2 Days	3	15.79
	3 Days	2	10.53
	4 Days	3	15.79
	5 Days	3	15.79
	6 Days	0	0.00
	7 Days	0	0.00
On the last weekend how many times did you do sports, dance, or play games in which you were very active?		(n=19)	
	0 Times	1	5.26
	1 Time	6	31.58
	2 Times	3	15.79
	3 Times	2	10.53
	4 Times	0	0.00
	5 Times	4	21.05
	6 Times or more	3	15.79

Table 2 (Continued)
Frequencies of Modified PAQ-C Questions 2-9 Responses

Item	Response	(n)	(%)
Which of these is most like you during the last week?	Almost all free time was spent doing sitting down things	2	10.53
	Some free time was spent doing active things	7	36.84
	A lot of free time was spent doing active things	5	26.32
	Almost all free time was spent doing active things	5	26.32
Were you sick last week?	Sick	2	10.53
	Not Sick	17	89.47
Did anything keep you from doing your normal physical activities last week?	Something	5	26.32
	Nothing	14	73.68

Modified PACES results. The modified PACES questionnaire recorded participants' feelings about themselves when participating in physical activity. Overall, the participants indicated more agreement (“sounds like me most of the time”) to the statements that reflected positive feelings than those that reflected negative feelings about being physically active. The three items with the highest percentage of responses indicating enjoyment were all positively valenced statements that included “I think I am good at it” (89.47%), “I feel good about myself” (89.47%), and “it’s very pleasant” (88.89%). Table 3 provides frequencies of the responses from the modified PACES.

Table 3
Frequencies of Modified PACES Responses

When I am physically active...	Response	(n)	(%)
I enjoy it		(n=19)	
	Sounds like me most of the time	16	84.21
	Sounds like me some of the time	2	10.53
	Doesn't sound like me	1	5.26
I feel bored		(n=19)	
	Sounds like me most of the time	1	5.26
	Sounds like me some of the time	4	21.05
	Doesn't sound like me	14	73.68
I don't like it		(n=19)	
	Sounds like me most of the time	2	10.53
	Sounds like me some of the time	1	5.26
	Doesn't sound like me	16	84.21
I think it's pleasurable		(n=19)	
	Sounds like me most of the time	13	68.42
	Sounds like me some of the time	5	26.32
	Doesn't sound like me	1	5.26
It's no fun at all		(n=19)	
	Sounds like me most of the time	1	5.26
	Sounds like me some of the time	4	21.05
	Doesn't sound like me	14	73.68
It gives me energy		(n=19)	
	Sounds like me most of the time	13	68.42
	Sounds like me some of the time	2	10.53
	Doesn't sound like me	4	21.05
It makes me sad		(n=19)	
	Sounds like me most of the time	0	0.00
	Sounds like me some of the time	3	15.79
	Doesn't sound like me	16	84.21
It's very pleasant		(n=18)	
	Sounds like me most of the time	16	88.89
	Sounds like me some of the time	1	5.56
	Doesn't sound like me	1	5.56
My body feels good		(n=18)	
	Sounds like me most of the time	12	66.70
	Sounds like me some of the time	5	27.78
	Doesn't sound like me	1	5.60

Table 3 (Continued)
Frequencies of Modified PACES Responses

When I am physically active...	Response	(n)	(%)
It's important that someone wants me to be doing the activity	Sounds like me most of the time	14	73.68
	Sounds like me some of the time	1	5.26
	Doesn't sound like me	4	21.05
It's very exciting	Sounds like me most of the time	14	73.68
	Sounds like me some of the time	2	10.53
	Doesn't sound like me	3	15.79
It frustrates me	Sounds like me most of the time	3	15.79
	Sounds like me some of the time	1	5.26
	Doesn't sound like me	15	78.95
It's not at all interesting	Sounds like me most of the time	4	21.05
	Sounds like me some of the time	4	21.05
	Doesn't sound like me	11	57.89
I feel good about myself	Sounds like me most of the time	17	89.47
	Sounds like me some of the time	0	0.00
	Doesn't sound like me	2	10.53
It makes me happy	Sounds like me most of the time	16	84.21
	Sounds like me some of the time	2	10.53
	Doesn't sound like me	1	5.26
I feel like I have to do the activity	Sounds like me most of the time	4	21.05
	Sounds like me some of the time	3	15.79
	Doesn't sound like me	12	63.16
I know people care that I like it or not	Sounds like me most of the time	9	47.37
	Sounds like me some of the time	8	42.11
	Doesn't sound like me	2	10.53
I think I am good at it	Sounds like me most of the time	17	89.47
	Sounds like me some of the time	1	5.26
	Doesn't sound like me	1	5.26

Survey Scores and Relationships

Activity scores for each of the 20 participants who completed a majority of the modified PAQ-C were calculated on the 1 to 5 (low to high activity) scale with scores ranging from 1.88 to 3.90, and a mean of 3.14 ($SD = 0.54$). Scores for the modified PACES were calculated on a 1 to 3 scale (low to high enjoyment). Since the item from Moore et al. (2009) “When I am physically active, I get something out of it” was removed from this modified PACES instrument due to comprehension concerns, a score of just the 15 statements similar to the instrument developed by Moore et al. (2009) was not calculated. Table 4 provides the average scores of the modified PACES survey instrument.

Table 4
Descriptive Statistics of modified PACES scores (n=19)

	Minimum	Maximum	Mean	Std. Deviation
PACES Score	1.94	3.00	2.64	.29
Intrinsic Motivation PACES Score	1.50	3.00	2.68	.36
Positively Valenced PACES Items	1.89	3.00	2.65	.36
Negatively Valenced PACES Items	2.00	3.00	2.62	.31

Pearson product-moment correlation coefficients were computed to assess the relationship between self-reported physical activity level and overall enjoyment. No significant correlation was found between self-reported physical activity level and overall enjoyment, $r(18)=.012$, $p=.963$. Additionally, Pearson product-moment correlation coefficients were computed to assess the relationship between self-reported physical activity level and intrinsic motivation. No significant correlation was found between self-reported physical activity level and intrinsic motivation, $r(18)=.193$, $p=.428$. Finally, as the constructs of autonomy, competence, and relatedness were only addressed by one or two statements each on the modified

PACES survey, it was not advisable to measure the relationships between each of them and level of physical activity.

Chapter 5: Discussion

The present study used two self-reporting questionnaires, modified versions of the Physical Activity Questionnaire for Older Children (PAQ-C) and the Physical Activity Enjoyment Scale (PACES), to look for relationships between physical activity levels and the enjoyment of physical activity in kindergarten children. The purpose of this chapter is to present the findings, conclusions, and recommendations resulting from the assessment conducted in this study. The following research questions guided this study:

- What is the relationship, if any, between overall enjoyment of physical activity and self-reported physical activity levels for kindergarten students in a diverse suburban elementary school using a modified PACES scale?
- What is the relationship, if any, between intrinsic motivation and self-reported physical activity levels for kindergarten students in a diverse suburban elementary school using a modified PACES scale?

Summary of Procedures

Data for this study were collected through the verbal administration of modified versions of the PAQ-C and PACES surveys. Participants were asked questions about their level of participation in various physical activities over the past week and feelings about themselves when participating in physical activities. Frequency analysis was used to explore the results and the Pearson product-moment correlation coefficient was used to determine if there were relationships between the variables as stated in the two research questions.

Summary of Findings and Discussion

The research questions in this study were guided by the current academic literature available on physical activity levels, enjoyment of physical activity, and young children. The following summary lays out the important findings for the research questions. It is important to

note that the participants of this study were from one school in the Midwest and the results are therefore not generalizable to all children of kindergarten age.

Physical activity levels. Self-reported levels of the specific 17-19 physical activities of the modified PAQ-C varied greatly based on the activity. Activities that were traditionally out of season, typically considered more structured, or required specific equipment or location access were reported by the fewest number of participants and on the fewest occasions in the past week. In contrast, the “less structured activities” of riding a bicycle, running, and playing at a playground or park were the top three responses. Fifty percent of participants even reported riding a bicycle 5 or more days in the past week and 25% reported riding a bicycle 7 or more times. Participants’ answers for the number of weekend, evening, and weekday afternoon physical activities were fairly moderate while moderate to high levels of physical activity were reported for activities that took place at school. Seventy percent of participants reported being “active a lot of the time” or “active the whole time” in gym class and 90% of participants reported “running around or playing a lot” or “running around or playing hard the whole time” during outdoor recess. The participants’ physical activity scores from the modified PAQ-C produced a moderate mean of 3.14 ($SD = 0.54$) on a 1 to 5 (low to high activity) scale.

Enjoyment of physical activity. Contrary to the findings of Telama et al. (2005) and Thompson et al. (2003) in older children and adolescents that enjoyment is an important predictor of physical activity level, no relationship was found between physical activity level and enjoyment. However, results of the modified PACES survey indicated that participants enjoy being physically active. Fifty percent or more of participants indicated enjoyment while participating in physical activities for all but one of the 18 possible modified PACES questions. Modified PACES enjoyment scores were analyzed in a number of ways. Each score or set of items reflected high levels of physical activity enjoyment. Where 3.00 was the highest possible

score, means (with standard deviations in parentheses) for the modified PACES enjoyment score, intrinsic motivation score, positively valenced PACES items and negatively valenced PACES items were 2.64 (0.29), 2.68 (0.36), 2.65 (0.36), and 2.62 (0.31), respectively. The average overall enjoyment score, 2.64 ($SD = 0.29$), is comparable to those found by Murcia et al. (2008) and Paxton et al. (2008).

Intrinsic motivation and self-determination theory. Even though no relationship was found between physical activity level and intrinsic motivation, four of the top five modified PACES survey items with the highest percentage of responses indicating enjoyment were categorized as “intrinsically motivated.” These items included the three positively worded statements “I feel good about myself,” “it’s very pleasant,” and “I enjoy it” to which the majority of participants chose “sounds like me most of the time” (89.47%, 88.89%, and 84.21% respectively), and the negatively worded “I don’t like it” to which the majority of participants (84.21%) chose “doesn’t sound like me.” These results, along with the high intrinsic motivation score from the modified PACES instrument reflect the importance of intrinsic motivation in Deci and Ryan’s (2000) self-determination theory.

Survey administration and the modified PACES instrument. Children younger than 8 years old (Moore et al., 2009) had previously not been given the PACES instrument or a modified version thereof in any published studies. The procedure in this study for collecting the participant data was unlike any used before to collect PACES data. Although the sample size was very small, the participants seemed to understand what the questions were asking and how to answer. The method of holding up colored pieces of paper and a certain number of fingers to give responses engaged the participants and gave the researcher a way to record more than one participant’s answer at a time. Only two individual item responses were left blank by one participant on the modified PACES survey. This method of surveying young children, especially

for use with the PACES instrument, could certainly be the subject of future studies with larger sample sizes.

Limitations

It is imperative to examine the limitations of the present study, not the least of which is generalizability. Criteria for participation required that participants be enrolled in one of four kindergarten classes at one specific elementary school.

The low response rate is also a limiting factor in this study. It is possible that many parents/guardians may not have wanted their child(ren) to participate in the study and chose to simply not return the Informed Consent form at all. It is also possible, however, that the Information of Risk/Informed Consent packet was overlooked amongst the other items in the students' backpacks and another distribution of the packet may have garnered more responses.

The concerns of self-report questionnaires must also be taken into account as limiting factors of this study. Recall of activity from the past week may be difficult for young children to accurately report. The fact that this study was presented to potential participants with "no right or wrong answers" may have led some participants to choose any answer, even if it was not the truth. Young children especially, however, can also fall victim to social desirability response bias without intention.

Finally, this study was conducted with a PACES instrument that had not been tested for validity or reliability. While similar to the instrument developed by Moore et al. (2009), the changes made to the instrument are substantial enough to require validity and reliability testing before being used again in the future.

While the limitations must be taken into consideration, much can still be learned from the findings of this study.

Conclusions

The following are the major findings of this study:

1. Participants enjoy being physically active.
2. Participants identify with statements reflecting high levels of intrinsic motivation.
3. There is no relationship between self-reported physical activity level and overall enjoyment.
4. There is no relationship between self-reported physical activity level and intrinsic motivation.

Recommendations

The next steps to get this modified PACES instrument in use with intervention studies would be to perform tests of reliability and validity with a much larger sample. Confirmation of the instrument's validity and reliability would hopefully result in its use in intervention programs such as those studies by Dishman et al. (2005), Lawman et al. (2011), Moore et al. (2009), Motl et al. (2001), and Paxton et al. (2008) in older children and adolescents.

It will make sense to pair any future use of this modified PACES instrument with other methods for measuring physical activity levels (Dishman et al., 2005; Lawman et al., 2011; Motl et al., 2001; Welk & Schaben, 2004). Using multiple methods to measure young children's physical activity will offer a more complete picture of the level of physical activity for young children as a group, as well as offer the possibility to retest this segment of the population for a relationship between physical activity and enjoyment.

This study was just a small piece of the puzzle for understanding young children's enjoyment of physical activity. However, the findings offer suggestions for numerous future research studies. Using this study and the already documented positive association of enjoyment with physical activity (Bauman et al., 2002; Boyd & Yin, 1996; DiLorenzo et al., 1998; Sallis et

al., 2000; Sallis et al., 1999; Trost et al., 2002; Williams, et al., 2005) as guides, young children need to continue to be studied in the area of physical activity enjoyment so that programs and initiatives can be developed, tested, and implemented to promote their health and well-being.

References

- Anderson, J., Ross, J., & Folsom, A. (2004). Anthropometric variables, physical activity, and incidence of ovarian cancer: The Iowa women's health study. *Cancer, 100*, 1515-1521. doi:10.1002/cncr.20146
- Barrett, B. J. (2001). Play now, play later: Lifetime fitness implications. *Journal of Physical Education, Recreation, & Dance, 72*, 35-39. doi:10.1080/07303084.2001.10605800
- Bassuk, S., & Manson, J. (2005). Epidemiological evidence for the role of physical activity in reducing risk of type 2 diabetes and cardiovascular disease. *Journal of Applied Physiology, 99*, 1193-1204. doi:10.1152/jappphysiol.00160.2005
- Bauman, A. E. (2004). Updating the evidence that physical activity is good for health: An epidemiological review 2000-2003, *Journal of Science and Medicine in Sport, 7*, 6-19. doi: 10.1016/S1440-2440(04)80273-1
- Bauman, A. E., Sallis, J. F., Dzewaltowski, D. A., & Owen, N. (2002). Toward a better understanding of the influences on physical activity: The role of determinants, correlates, causal variables, mediators, moderators, and confounders. *American Journal of Preventive Medicine, 23*, 5-14. doi:10.1016/S0749-3797(02)00469-5
- Blair, S. N., LaMonte, M. J., & Nichaman, M. Z. (2004). The evolution of physical activity recommendations: How much is enough? *American Journal of Clinical Nutrition, 79*, 913S-920S. Retrieved from <http://ajcn.nutrition.org/content/79/5/913S.full>
- Boyd, M. P., & Yin, Z. (1996). Cognitive-affective sources of sport enjoyment in adolescent sport participants. *Adolescence, 31*, 383-395. Retrieved from <https://www.proquest.com/en-US/>

- Burdette, H. L., & Whitaker, R. C. (2005). Resurrecting free play in young children: Looking beyond fitness and fatness to attention, affiliation, and affect. *Archives of Pediatric & Adolescent Medicine, 159*, 46-50. doi:10.1001/archpedi.159.1.46
- Calton, B., Lacey, J., Schatzkin, A., Schairer, C., Colbert, L., Albanes, D., & Leitzmann, M. (2006). Physical activity and the risk of colon cancer among women: A prospective cohort study (United States). *International Journal of Cancer, 119*, 385-391. doi:10.1002/ijc.21840
- Carraro, A., Young, M. C., & Robazza, C. (2008). A contribution to the validation of the physical activity enjoyment scale in an Italian sample. *Social Behavior and Personality, 36*, 911-918. doi:10.2224/sbp.2008.36.7.911
- Craig, S., Goldberg, J., & Dietz, W. (1996). Psychosocial correlates of physical activity among fifth and eighth graders. *Preventive Medicine, 25*, 506-513. doi:10.1006/pmed.1996.0083
- Crocker, P. R., Bailey, D.A., Faulkner, R. A., Kowalski, K. C., & McGrath, R. (1997). Measuring general levels of physical activity: Preliminary evidence for the Physical Activity Questionnaire for Older Children. *Medicine & Science in Sports & Exercise, 29*, 1344-1349. doi:10.1097/00005768-199710000-00011
- De Civita, M., Refier, D., Alamgir, A. H., Anis, A. H., FitzGerald, M. J., & Marra, C. A. (2005). Evaluating health-related quality-of-life studies in pediatric populations. *Pharmacoeconomics, 23*, 659-685. doi:10.2165/00019053-200523070-00003
- Deci, E. & Ryan, R. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268. doi:10.1207/S15327965PLI1104_01

- DiLorenzo, T. M., Stucky-Ropp, R. C., Vander Wal, J. S., & Gotham, H. J. (1998). Determinants of exercise among children. II. A longitudinal analysis. *Preventive Medicine, 27*, 470-477. doi:10.1006/pmed.1998.0307
- Dishman, R. K., Motl, R. W., Saunders, R., Felton, G., Ward, D. S., Dowda, M., & Pate, R. R. (2005). Enjoyment mediates effects of a school-based physical-activity intervention. *Medicine & Science in Sports & Exercise, 37*, 478-487. doi:10.1249/01.MSS.0000155391.62733.A7
- Garret, N., Brasure, M., Schmitz, K., Schultz, M., & Huber, M. (2004). Physical inactivity: Direct cost to a health plan. *American Journal of Preventative Medicine, 27*, 304-309. doi:10.1016/j.amepre.2004.07.014
- Goodway, J. D., & Smith, D. W. (2005). Keeping all children healthy: Challenges to leading an active lifestyle for preschool children qualifying for at-risk programs. *Family Community Health, 28*, 142-155. doi:10.1097/00003727-200504000-00006
- Hankey, G. (2006). Potential new risk factors for ischemic stroke: What is their potential? *Stroke, 37*, 2181-2188. doi:10.1161/01.STR.0000229883.72010.e4
- Heesch, K. C., Mâsse, L. C., & Dunn, A. L. (2006). Using Rasch modeling to re-evaluate three scales related to physical activity: Enjoyment, perceived benefits and perceived barriers. *Health Education Research, 21*, i58-i72. doi:10.1093/her/cyl054
- Heitzler, C. D., Levin Martin, S., Duke, J., & Huhman, M. (2006). Correlates of physical activity in a national sample of children aged 9 – 13 years. *Preventive Medicine, 42*, 254-260. doi:10.1016/j.ypped.2006.01.010

- Hills, A. P., King, N. A., & Armstrong, T. P. (2007). The contribution of physical activity and sedentary behaviours to the growth and development of children and adolescents: Implications for overweight and obesity. *Sports Medicine*, 37, 533-545.
doi:10.2165/00007256-200737060-00006
- Hu, G., Lindström, J., Valle, T., Eriksson, J., Jousilahti, P., Silventoinen, K., Qiao, Q., & Tuomilehto, J. (2004). Physical activity, body mass index, and risk of type 2 diabetes in patients with normal or impaired glucose regulation. *Archives of Internal Medicine*, 164, 892-896. doi:10.1001/archinte.164.8.892
- Jekauc, D., Voelkle, M., Wagner, M. O., Mewes, N., & Woll, A. (2013). Reliability, validity, and measurement invariance of the German version of the Physical Activity Enjoyment Scale. *Journal of Pediatric Psychology*, 38, 104-115. doi:10.1093/jpepsy/jss088
- Kendzierski, D., & DeCarlo, K. J. (1991). Physical Activity Enjoyment Scale: Two validation studies. *Journal of Sport & Exercise Psychology*, 13, 50-64. Retrieved from <http://journals.humankinetics.com/jsep>
- Kohl, H. W., & Hobbs, K. E. (1998). Development of physical activity behaviors among children and adolescents. *Pediatrics*, 101, 549-554. Retrieved from <http://pediatrics.aappublications.org>
- Kowalski, K. C., Crocker, P. R., & Donen, R. M. (2004). *The Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) Manual*. Retrieved from <http://www.hkin.educ.ubc.ca/behavioural/PAQ%20manual.pdf>
- Kowalski, K. C., Crocker, P. R., & Faulkner, R. A. (1997). Validation of the Physical Activity Questionnaire for Older Children. *Medicine & Science in Sports & Exercise*, 29, 174-186. Retrieved from <http://www.acsm.org/access-public-information/acsm-journals/medicine-science-in-sports-exercise>

- Labbrozzi, D., Robazza, C., Bertollo, M., Bucci, I., & Bortoli, L. (2013). Pubertal development, physical self-perception, and motivation toward physical activity in girls. *Journal of Adolescence*, *36*, 759-765. doi:10.1016/j.adolescence.2013.06.002
- Lawman, H. G., Wilson, D. K., Van Horn, M. L., Resnicow, K., & Kitzman-Ulrich, H. (2011). The relationship between psychosocial correlates and physical activity in underserved adolescent boys and girls in the ACT trial. *Journal of Physical Activity & Health*, *8*, 253-261. Retrieved from <http://journals.humankinetics.com/jpah>
- Lee, I. (2003). Physical activity and cancer prevention – Data from epidemiologic studies. *Medicine & Science in Sports & Exercise*, *35*, 1823-1827. Retrieved from <http://www.acsm.org/access-public-information/acsm-journals/medicine-science-in-sports-exercise>
- Magnusson, C., Roddam, A., Pike, M., Chilvers, C., Crossley, B., Hermon, C., McPherson, K., Peto, J., Vessey, M., & Beral, V. (2005). Body fatness and physical activity at young ages and the risk of breast cancer in premenopausal women. *British Journal of Cancer*, *93*, 817-824. doi:10.1038/sj.bjc.6602758
- Margolis, K., Mucci, L., Braaten, T., Kumle, M., Lagerros, Y., Adami, H., Lund, E., & Weiderpass, E. (2005). Physical activity in different periods of life and the risk of breast cancer: The Norwegian-Swedish women's lifestyle and health cohort study. *Cancer Epidemiology, Biomarkers, & Prevention*, *14*, 27-32. Retrieved from <http://cebp.aacrjournals.org/content/14/1/27.full>
- Michigan Department of Education. (2014). *Student Count, 2010-2011, Village Oaks Elementary School, Novi Community School District, Oakland Schools* [Data file]. Available from <https://www.mischooldata.org/DistrictSchoolProfiles/EntitySummary/SchoolDataFile.aspx>

- Miles, L. (2007). Physical activity and the prevention of cancer: A review of recent findings. *Nutrition Bulletin*, 32, 250-282. doi:10.1111/j.1467-3010.2007.00653.x
- Moore, J. B., Yin, Z., Hanes, J., Duda, J., Gutin, B., & Barbeau, P. (2009). Measuring enjoyment of physical activity in children: Validation of the Physical Activity Enjoyment Scale. *Journal of Applied Sport Psychology*, 21, S116-S129. doi: 10.1080/10413200802593612
- Motl, R. W., Dishman, R. K., Saunders, R., Dowda, M., Felton, G., Pate, R. R. (2001). Measuring enjoyment of physical activity in adolescent girls. *American Journal of Preventive Medicine*, 21, 110-117. doi:10.1016/S0749-3797(01)00326-9
- Mullen, S. P., Olson, E. A., Phillips, S. M., Szabo, A. N., Wójcicki, T. R., Mailey, E. L.,... McAuley, E. (2011). Measuring enjoyment of physical activity in older adults: Invariance of the physical activity enjoyment scale (paces) across groups and time. *International Journal of Behavioral Nutrition and Physical Activity*, 8, 103-111. doi:10.1186/1479-5868-8-103
- Murcia, J. A. M., de San Román, M. L., Galindo, C. M., Alonso, N., & González-Cutre, D. (2008). Peers' influence on exercise enjoyment: A self-determination theory approach. *Journal of Sports Science & Medicine*, 7, 23-31. Retrieved from <http://www.jssm.org/vol7/n1/4/v7n1-4text.php>
- Patel, A., Rodriguez, C., Bernstein, L., Chao, A., Thun, M., & Calle, E. (2005). Obesity, recreational physical activity, and risk of pancreatic cancer in a large U.S. cohort. *Cancer Epidemiology, Biomarkers, & Prevention*, 14, 459-466. doi:10.1158/1055-9965.EPI-04-0583
- Paxton, R. J., Nigg, C., Motl, R. W., Yamashita, M., Chung, R., Battista, J., & Chang, J. (2008). Physical Activity Enjoyment Scale short form – Does it fit for children?. *Research Quarterly for Exercise and Sport*, 79, 423-427. doi:10.1080/02701367.2008.10599508

- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68-78.
doi:10.1037/0003-066X.55.1.68
- Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine & Science in Sports & Exercise, 32*, 963-975.
doi:10.1097/00005768-200005000-00014
- Sallis, J. F., Prochaska, J. J., Taylor, W. C., Hill, J. O., & Geraci, J. C. (1999). Correlates of physical activity in a national sample of girls and boys in grades 4 through 12. *Health Psychology, 18*, 410-415. doi:10.1037/0278-6133.18.4.410
- Samad, A., Taylor, R., Marshall, T., & Chapman, M. (2004). A meta-analysis of the association of physical activity with reduced risk of colorectal cancer. *Colorectal Disease, 7*, 204-213. doi:10.1111/j.1463-1318.2005.00747.x
- Schouten, L., Goldbohm, R., & van den Brandt, P. (2004). Anthropometry, physical activity, and endometrial cancer risk: Results from The Netherlands cohort study. *Journal of the National Cancer Institute, 96*, 1635-1638. doi:10.1093/jnci/djh291
- Tehard, B., Friedenreich, M., Oppert, J., & Clavel-Chapelon F. (2006). Effect of physical activity on women at increase risk of breast cancer: Results from the E3N cohort study. *Cancer Epidemiology, Biomarkers, & Prevention, 15*, 57-64.
doi:10.1158/1055-9965.EPI-05-0603
- Telama, R., Yang, X., Viikari, J., Välimäki, I., Wanne, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: A 21-year tracking study. *American Journal of Preventive Medicine, 28*, 267-273. doi:10.1016/j.amepre.2004.12.003

- Thompson, A. M., Humbert, M. L., & Mirwald, R. L. (2003). A longitudinal study of the impact of childhood and adolescent physical activity experiences on adult physical activity perceptions and behaviors. *Qualitative Health Research, 13*, 358-377.
doi:10.1177/1049732302250332
- Torti, D. & Matheson, G. (2004). Exercise and prostate cancer. *Sports Medicine, 34*, 363-369.
doi:10.2165/00007256-200434060-00003
- Tremblay, M., & Williams, J. (2003). Is the Canadian childhood obesity epidemic related to physical inactivity? *International Journal of Obesity, 27*, 1100-1105.
doi:10.1038/sj.ijo.0802376
- Trost, S. G., Pate, R. R., Dowda, M., Ward, D. S., Felton, G., & Saunders, R. (2002). Psychosocial correlates of physical activity in white and African-American girls. *Journal of Adolescent Health, 31*, 226-233. doi:10.1016/S1054-139X(02)00375-0
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. (1996). Physical activity and health: A report of the Surgeon General. Retrieved from <http://www.cdc.gov/nccdphp/sgr/index.htm>
- Veugelers, P., & Fitzgerald, A. (2005). Prevalence of and risk factors for childhood overweight and obesity. *Canadian Medical Association Journal, 173*, 607-613.
doi:10.1503/cmaj.050445
- Warburton, D., Nicol, C., & Bredin, S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal, 174*, 801-809.
doi:10.1503/cmaj.051351

- Wei, E., Giovannucci, E., Wu, K., Rosner, B., Fuchs, C., Willett, W., & Colditz, G. (2003). Comparison of risk factors for colon and rectal cancer. *International Journal of Cancer*, *108*, 433-442. doi:10.1002/ijc.11540
- Weinstein, A., Sesso, H., Lee, I., Cook, N., Manson, J., Buring, J., & Gaziano, J. (2004). Relationship of physical activity vs body mass index with type 2 diabetes in women. *Journal of the American Medical Association*, *292*, 1188-1194. doi:10.1001/jama.292.10.1188
- Welk, G. J., & Schaben, J. A. (2004). Psychosocial correlates of physical activity in children – A study of relationships when children have similar opportunities to be active. *Measurement in Physical Education and Exercise Science*, *8*, 63-81. doi:10.1207/s15327841mpee0802_2
- Wendel-Vos, G., Schuit, A., Feskens, E., Boshuizen, H., Verschuren, W., Saris, W., & Kromhout, D. (2004). Physical activity and stroke. A meta-analysis of observational data *International Journal of Epidemiology*, *33*, 787-798. doi:10.1093/ije/dyh168
- Williams, D. M., Anderson, E. S., & Winett, R. A. (2005). A review of the outcome expectancy construct in physical activity research. *Annals of Behavioral Medicine*, *29*, 70-79. doi:10.1207/s15324796abm2901_10
- Yli-Piipari, S., Watt, A., Jaakkola, T., Liukkonen, J., & Nurmi, J. E. (2009). Relationships between physical education students' motivational profiles, enjoyment, state anxiety, and self-reported physical activity. *Journal of Sports Science & Medicine*, *8*, 327-336. Retrieved from <http://www.jssm.org/vol8/n3/3/v8n3-3text.php>

APPENDICES

Appendix A
Human Subjects Initial Approval



EASTERN MICHIGAN UNIVERSITY

June 15, 2010

Samantha Smith
c/o Susan McCarthy
Eastern Michigan University
School of Health Promotion and Human Performance
Ypsilanti, Michigan 48197

Dear Samantha Smith,

The CHHS Human Subjects Review Committee has reviewed the revisions to your proposal entitled: "Young Children's Enjoyment of Physical Activity" (CHHS 10-040).

The committee reviewed your proposal and its revisions and concluded that the risk to participants is minimal. Your study is approved by the committee.

Good luck in your research endeavors.

Sincerely,

A handwritten signature in black ink, appearing to read "George Liepa".

George Liepa, Ph.D.
Chair, CHHS Human Subjects Review Committee

Appendix B

Human Subjects Minor Modification Approval Email

Subject: MS #1020 - College of Health and Human Services Human Subjects
From: Gretchen Dahl Reeves <editor-chhs_hs-1020-1398477@commons.emich.edu>
To: Samantha R Smith <:ssmith74@emich.edu>
Cc: The Authors <authors-chhs_hs-1020@commons.emich.edu>, The Administrators <editors-chhs_hs-1020@commons.emich.edu>
Date: Thu, Apr 28, 2011 at 4:46 PM

Dear Samantha,

Congratulations! After careful review of the revisions to your proposal your continuation of the study "Young Children's Enjoyment of Physical Activity" has been approved.

Please modify your consent form to reflect 'Gretchen Dahl Reeves' as Chair of CHHS HSRC and insert the dates 4/28/11 to 4/27/12 and upload that to digital commons as an additional revision.

The current version of your paper is available here:
http://commons.emich.edu/cgi/preview.cgi?article=1020&context=chhs_hs
To submit revisions, use the Revise Submission link on that page.

Good luck with your research project.

Sincerely,
Gretchen Dahl Reeves
CHHS HSRC Chair

Appendix C

Grade School Permission Email

Subject: Re: Research Request (Tammy Smith's daughter)
From: Sue Burnham <sburnham@novi.k12.mi.us>
To: Samantha Smith <ssmith74@emich.edu>
Date: Thu, Apr 29, 2010 at 11:48 AM

Sounds great!

Sue Burnham
Principal
Village Oaks Elementary
sburnham@novi.k12.mi.us
248-449-1302

Subject: Re: Research Request (Tammy Smith's daughter)
From: Samantha Smith <ssmith74@emich.edu>
To: Sue Burnham <sburnham@novi.k12.mi.us>
Date: Thu, Apr 29, 2010 at 10:32 AM

Hi Mrs. Burnham,
It's Samantha Smith again. Thank you so much for your upbeat initial support of my research project. I am in the final stages of preparing my paperwork before my proposed data collection. My hope is to be able to collect data this mid-May. The procedures, barring any changes after the results from a small pilot study, will include removing kindergarten students from the classroom in groups of three to verbally administer a survey that should take approximately 15-20 minutes. I will be asking them questions about their recent physical activity and enjoyment of it. I will be constructing simple dividers between the students and using visual answer choices (holding up fingers or colored sheets of paper) to maintain confidentiality between the students. I will be the only person looking at the individual answers and the student's names or teacher will not be connected with their survey responses. The only demographic information I will obtain will be age and gender. There will be a parent/guardian informed consent sheet that must be signed and returned to me for the student to be allowed to participate in the survey. I will also be acquiring verbal assent from the students if they have the signed parent/guardian consent form turned in to me. This constitutes my formal request for Village Oaks school's kindergarten classes participation in my research study. If you have any questions or would like to view any of the (working) documents, please don't hesitate to ask. I will be providing you with the final approved version of the verbal survey once I obtain my college's human subjects board approval.

Thank you so much,
Samantha Smith

Appendix D

Parent/Guardian Informed Consent

Young Children's Enjoyment of Physical Activity A Research Survey

INFORMATION OF RISK (Parent/Guardian Consent)

ABOUT THE STUDY:

- This study is being conducted by an Eastern Michigan University graduate student researcher under the supervision of Eastern Michigan University faculty thesis committee members in order to better understand children's enjoyment of physical activity and how it relates to their actual physical activity level.

WHAT WILL HAPPEN?

If you approve of your child's participation in this study:

- He or she will be asked to respond orally and with visual markers to survey questions given orally by the Eastern Michigan University graduate student researcher. The questions will ask about the physical activities he or she has participated in within the last week as well as his or her feelings about the activities.
- Surveys will be given to small groups of children and only the researcher will be able to see and hear the children's answers. Your child will be placed at a round table with dividers sectioning off each individual (similar to public computing stations) so that his or her answers will not be seen or heard by the other children.
- Your child will be removed from the current classroom activity in order to take the survey which should last no more than 20 minutes.

WILL ANYONE KNOW MY CHILD WAS IN THE STUDY?

- NO. Your child will not have his or her name on the survey. The only time your child's name will be used will be on a class check-off sheet so that no child is left out of the survey, surveyed more than once, or without a signed parental consent form.
- Your child's participation and his or her answers to the survey are strictly confidential. Only the graduate student researcher will see and hear the answers to the individual surveys. The survey results will be reported with all of the students' data combined; therefore, your son or daughter's information will NOT be identifiable.

ARE THERE BENEFITS OR RISKS FOR PARTICIPATION IN THE STUDY?

- No. There are no known or anticipated benefits or risks to your child for participating in this study. There is also no monetary payment for participation in this study.

IS MY CHILD REQUIRED TO PARTICIPATE IN THE STUDY?

- NO. Participation in this study is completely voluntary. Your son or daughter may choose to not take the survey. He or she may also stop taking the survey or choose not to answer any of the questions on the survey at any time.
- Your child will be asked immediately before taking the survey if he or she wishes to participate in it.
- There will be no penalty to you or your child for choosing to not participate in this study.

ABOUT THE RESULTS OF THE STUDY:

- The Eastern Michigan University graduate student researcher will provide a final report to the elementary school principal. Results will also be reported in the thesis manuscripts submitted to Eastern Michigan University's Graduate School. Results may be submitted for conference presentations and peer-reviewed journal publication.

WHO CAN I ASK IF I HAVE ANY QUESTIONS?

- If you have any questions now or at a later time you can contact:

Susan McCarthy, PhD
Associate Professor - Health Education Program
Eastern Michigan University
734-487-7120, ext. 2717
smccarthy@emich.edu

WHAT SHOULD I DO IF I WANT MY CHILD TO PARTICIPATE IN THIS STUDY?

Please indicate whether or not you agree to have your child participate in this study and return this form to your child's teacher immediately. Thank you for your response.

I AGREE to have my child participate in the study described above which is part of an authorized research program at Eastern Michigan University. I understand the purpose of the survey and my questions, if any, have been answered.

OR

I DO NOT PERMIT my child to participate in the study described above.

Parent/Guardian Signature

Print Parent/Guardian Name

Date

Print Child's Name

Name of Child's Teacher

This research protocol and informed consent document has been reviewed and approved by the Eastern Michigan University CHHS Human Subjects Review Committee for use from 4/28/11 to 4/27/12. If you have questions about the approval process, please contact Gretchen Dahl Reeves (734.487.0077, Chair of CHHS HSRC, chhs_human_subjects@emich.edu).

Parent/Guardian Copy to Keep

WHAT SHOULD I DO IF I WANT MY CHILD TO PARTICIPATE IN THIS STUDY?

Please indicate whether or not you agree to have your child participate in this study and return this form to your child's teacher immediately. Thank you for your response.

I AGREE to have my child participate in the study described above which is part of an authorized research program at Eastern Michigan University. I understand the purpose of the survey and my questions, if any, have been answered.

OR

I DO NOT PERMIT my child to participate in the study described above.

Parent/Guardian Signature

Print Parent/Guardian Name

Date

Print Child's Name

Name of Child's Teacher

This research protocol and informed consent document has been reviewed and approved by the Eastern Michigan University CHHS Human Subjects Review Committee for use from 4/28/11 to 4/27/12. If you have questions about the approval process, please contact Gretchen Dahl Reeves (734.487.0077, Chair of CHHS HSRC, chhs_human_subjects@emich.edu).

Copy to Return to Researcher
Via Student's Teacher

Appendix E

Actual Assent

I would like to ask you questions about your physical activities (things that you do that make you breathe hard or make your legs feel tired) and how you feel about them. If you would like me to ask you these questions, please raise your hand. If you do not want to answer these questions, please tell me now. It is okay if you do not want to. These questions I am going to ask you are not a test. You do not have to answer them if you do not want to. Only I will see your answers.

Appendix F

PAQ-C Modified Survey Assent and Script

The first questions are about your physical activities and how you feel about them. Physical activities are things like sports, games or dance that make you sweat, make your legs feel tired, or make you breathe hard. Some more examples are tag, skipping, running, climbing, soccer, chasing, playing on a playground, and things like that. I am going to ask you to give me your answers to these questions by holding up your fingers for a question that asks you about the number of times you did something or by holding up the colored papers in front of you. For example if I said, “Which do you like better: spaghetti or pizza? Hold up the blue paper if you like spaghetti better and hold up the yellow paper if you like pizza better,” would you know what to do? Let’s try it together. Which do you like better: spaghetti or pizza? Hold up the blue paper if you like spaghetti better and hold up the yellow paper if you like pizza better. Great! If you don’t understand during any of these questions, just raise your hand and I can help you. I can also say questions again if you need me to do that. Please don’t hold up a color just because you like it better than another color. Use the color that matches the answer to the question. Can you do that for me? Now, don’t forget, this is not any kind of test. I would just like to know about you. There are no right or wrong answers. Just answer by telling the truth. You can stop answering the questions at any time and you will not be in trouble. Thank you so much. If you want to leave and not answer these questions, please tell me now. If you want to stay and answer these questions, let’s get started!

1. How many times in the last week (a week is the last seven days so Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday) did you _____? (“when you were not at school” is needed for activities A, D, E, G, I, J, K)

If you didn’t _____ last week, hold up a closed fist.

If you _____ one time, hold up one finger.

If you _____ two times, hold up two fingers.

If you _____ three times, hold up three fingers.

If you _____ four times, hold up four fingers.

If you _____ five times, hold up five fingers.

If you _____ six times, hold up six fingers.

If you _____ seven times, hold up seven fingers.

A. skip

B. go canoeing or rowing in a boat

C. go roller skating or rollerblading

D. play tag

E. go for a walk

F. ride a bicycle

G. go running just to run

H. go swimming

I. play baseball or softball

J. dance

K. play football

L. play soccer

M. play volleyball

N. play basketball

O. go ice skating

P. play hockey

Q. play on a playground or at a park

R. S., etc...as needed (any other physical activities)

2. The last time you had gym class here at school, how often were you very active (playing hard, running, jumping, throwing, or things like that)?

If you were just a little bit active, hold up your blue paper.

If you were active some of the time but not all of it, hold up your yellow paper.

If you were active a lot of the time, hold up your green paper.

If you were active the whole time, hold up your purple paper.

3. In the last week (a week is the last seven days so Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday) what did you do most of the time when you had outdoor recess?

If you were mostly sitting down, hold up your yellow paper.

If you were mostly standing or just walking around, hold up your green paper.

If you were running around or playing a little bit, hold up your purple paper.

If you were running around or playing a lot, hold up your red paper.

If you were running around or playing hard the whole time, hold up your blue paper.

4. In the last week (a week is the last seven days so Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday) on how many days right after school did you do sports, dance, or play games in which you were very active? (Active is something like breathing hard or your legs feeling tired)?

If you didn't do sports, dance, or play games at all right after school last week, hold up a closed fist.

If it was one day after school last week, hold up one finger.

If it was two days after school last week, hold up two fingers.

If it was three days after school last week, hold up three fingers.

If it was four days after school last week, hold up four fingers.

If it was all five days after school last week, hold up five fingers.

5. In the last week (a week is the last seven days so Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday) on how many evenings (later at night, not right after school) did you do sports, dance, or play games in which you were very active? (Active is something like breathing hard or your legs feeling tired)

If you didn't do sports, dance, or play games at all in the evenings, hold up a closed fist.

If it was one day in the evening last week, hold up one finger.

If it was two days in the evening last week, hold up two fingers.

If it was three days in the evening last week, hold up three fingers.

If it was four days in the evening last week, hold up four fingers.

If it was five days in the evening last week, hold up five fingers.

If it was six days in the evening last week, hold up six fingers.

If it was seven days in the evening last week, hold up seven fingers.

6. On the last weekend (the two days, Saturday and Sunday, that you are not in school) how many times did you do sports, dance, or play games in which you were very active? (Active is something like breathing hard or your legs feeling tired)

If you didn't do sports, dance, or play games at all last weekend, hold up a closed fist.

If it was one time last weekend, hold up one finger.

If it was two times last weekend, hold up two fingers.

If it was three times last weekend, hold up three fingers.

If it was four times last weekend, hold up four fingers.

If it was five times last weekend, hold up five fingers.

If it was six or more times last weekend, hold up six fingers.

7. Which of these is most like you during the last week? (A week is the last seven days so Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday) Listen to all the choices before you put up an answer. I will say the choices again after I say them all the first time.

Was almost all of your free time (time when you're not in school or doing something planned with your family) spent doing sitting down things like reading, watching TV, or playing video games? If this sounds most like you, hold up your yellow paper.

Was some of your free time spent doing active things like riding your bike, playing sports, or other things that make you breathe hard or have your legs feel tired? If this sounds most like you, hold up your green paper.

Was a lot of your free time spent doing active things like riding your bike, playing sports, or other things that make you breathe hard or have your legs feel tired? If this sounds most like you, hold up your purple paper.

Was almost all of your free time spent doing active things like riding your bike, playing sports, or other things that make you sweat, breathe hard or have your legs feel tired? If this sounds most like you, hold up your red paper.

8. Were you sick last week? (A week is the last seven days so Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday)

If you were sick, hold up your blue paper.

If you were not sick, hold up your yellow paper.

9. Did anything (maybe a family trip or something else) keep you from doing your normal physical activities last week? (Physical activities are things that make you sweat, breathe hard, or make your legs feel tired. A week is the last seven days so Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday)

If nothing kept you from doing your normal physical activities last week, hold up your green paper.

If something did keep you from doing your normal physical activities last week, hold up your purple paper.

Appendix G

PACES Modified Survey Assent and Script

The last questions I asked you were about the physical activities that you did last week. Now I want to know how you feel about being physically active. You remember what being physically active is, right? Being physically active is doing something that makes your body move like playing games, sports, chasing, or playing on a playground. You might get sweaty, start breathing hard, or having your legs feel tired. Remember that? Great! We are going to use those colored papers again to answer these questions. This time we are only going to use the red, green, and yellow colors. You're going to hold up the green paper when what I say sounds like you most of the time. You're going to hold up the yellow paper when what I say sounds like you some of the time. You're going to hold up the red paper when what I say doesn't sound like you. I can help you if you get stuck. You can stop answering the questions at any time and you will not be in trouble. Thank you so much. If you want to leave and not answer these questions, please tell me now. If you want to stay and answer these questions, let's get started! Are you ready? Let's go!

Stem: When I am physically active...

1. I enjoy it (explanation: like)
2. I feel bored
3. I don't like it
4. I think it's pleasurable (explanation: nice)
5. It's no fun at all
6. It gives me energy
7. It makes me sad
8. It's very pleasant
9. My body feels good
10. It's important that someone wants me to be doing the activity
11. It's very exciting (explanation: fun, full of energy)
12. It frustrates me (explanation: upset/angry)
13. It's not at all interesting
14. I feel good about myself
15. It makes me happy
16. I feel like I have to do the activity
17. I know people care that I like it or not
18. I think I am good at it

Appendix H

Modified PAQ-C and Modified PACES Survey Response Sheet

The student has been given thorough instructions and the option to decline participating in this survey. He or she has verbally agreed to take the survey.

Male / Female Age _____ years

Modified PAQ-C

1A	(skip)	1	2	3	4	5	6	7
1B	(canoe/row)	1	2	3	4	5	6	7
1C	(roller skating/rollerblading)	1	2	3	4	5	6	7
1D	(tag)	1	2	3	4	5	6	7
1E	(walk)	1	2	3	4	5	6	7
1F	(bicycle)	1	2	3	4	5	6	7
1G	(running)	1	2	3	4	5	6	7
1H	(swimming)	1	2	3	4	5	6	7
1I	(baseball/softball)	1	2	3	4	5	6	7
1J	(dance)	1	2	3	4	5	6	7
1K	(football)	1	2	3	4	5	6	7
1L	(soccer)	1	2	3	4	5	6	7
1M	(volleyball)	1	2	3	4	5	6	7
1N	(basketball)	1	2	3	4	5	6	7
1O	(ice skating)	1	2	3	4	5	6	7
1P	(hockey)	1	2	3	4	5	6	7
1Q	(playground/park)	1	2	3	4	5	6	7
1R	Activity: _____	1	2	3	4	5	6	7
1S	Activity: _____	1	2	3	4	5	6	7

Modified PAQ-C continued

2. Blue Yellow Green Purple
3. Yellow Green Purple Red Blue
4. 1 2 3 4 5
5. 1 2 3 4 5 6 7
6. 1 2 3 4 5 6
7. Yellow Green Purple Red
8. Blue Yellow
9. Green Purple

Modified PACES

Green = what I say sounds like you most of the time

Yellow = what I say sounds like you some of the time

Red = what I say doesn't sound like you

- | | |
|--|--|
| 1. Green Yellow Red | 10. Green Yellow Red |
| 2. Green Yellow Red | 11. Green Yellow Red |
| 3. Green Yellow Red | 12. Green Yellow Red |
| 4. Green Yellow Red | 13. Green Yellow Red |
| 5. Green Yellow Red | 14. Green Yellow Red |
| 6. Green Yellow Red | 15. Green Yellow Red |
| 7. Green Yellow Red | 16. Green Yellow Red |
| 8. Green Yellow Red | 17. Green Yellow Red |
| 9. Green Yellow Red | 18. Green Yellow Red |