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## Physical Activity Differences Related to Gender and Grade Level in Middle School Students

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May 2016

To the Dean of the Graduate School:

We are submitting a thesis written by Casey Reeves entitled PHYSICAL ACTIVITY DIFFERENCES RELATED TO GENDER AND GRADE LEVEL IN MIDDLE SCHOOL STUDENTS

We recommend acceptance in partial fulfillment of the requirements for the degree of Master of Science in Sport and Fitness Administration through the Richard W. Riley College of Education

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PHYSICAL ACTIVITY DIFFERENCES RELATED TO GENDER AND GRADE  
LEVEL IN MIDDLE SCHOOL STUDENTS

A Thesis  
Presented to the Faculty  
Of the  
Richard W. Riley College of Education  
In Partial Fulfillment  
Of the  
Requirements for the Degree  
Of  
Master of Science  
In Sport and Fitness Administration  
Winthrop University

May 2016

By  
Casey Reeves

## **Abstract**

In the last 35 years, the United States youth has experienced a significant rise in obesity levels, and a significant decline in physical activity levels (Centers for Disease Control and Prevention [CDC], 2015a; CDC, 2009). A variety of research has been conducted on the implications of decreasing levels of physical activity (PA). However, theories are mixed on when this rapid decline of participation in PA is occurring. The purpose of this study was twofold: 1) to identify a significant gap in PA levels between females and males and 2) to identify the age/grade in which the projected discrepancy develops. The participants included 92 middle school students. Of the participants, 48% were female and 52% were male. The Physical Activity Questionnaire for Older Children (PAQ-C), a self-report measure of PA was administered to each participant during his/her regular physical education class. A one-way ANOVA was performed to determine differences in the participant's general levels of PA by gender. The results indicated there were significant differences between genders for activity performed during physical education, for activity performed directly after school, for activity levels during the evenings, and for activity levels during the weekend. Significant differences were present between grade levels for activity performed directly after school, and for activity performed during the weekend. When participants reported their overall activity levels, there were no significant differences in the data. This contrast highlights the limitation of self-report data. The significant results are beneficial for school administrators and physical educators in identifying when to specifically implement interventions to target female inactivity as well as inactivity based on age. These targeted interventions could

potentially decrease the threat of physical inactivity in late adolescence, by offering more physical education and other opportunities for physical activity tailored to time periods when adolescents need more PA.

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## **Chapter 1**

### **Introduction**

Adolescent participation in physical activity (PA) has been studied extensively for years. Although it is well known that most adolescents do not reach the recommended daily amounts of PA, the disproportions across gender and grade level for participation in PA are less recognized (Centers for Disease Control and Prevention [CDC], 2009). The two most identifiable campaigns to address the overall lack of PA for adolescents are the NFL Play 60 campaign introduced in 2007 and the Let's Move initiative launched by First Lady, Michelle Obama in 2010 (NFL Play 60, 2007; Let's Move, 2010). Each campaign has added to the recognition of the problem of the lack of participation in PA among adolescents.

In examining PA trends, researchers have found a discrepancy in the activity levels of males versus females. Several researchers have found that a greater percentage of adolescent males report being highly active, while a greater percentage of adolescent females report more frequent sedentary behavior (Jago, Anderson, Baranowski, & Watson, 2005; Lenhart et al., 2012). Utilizing these data, researchers can concentrate efforts to increase PA levels overall, as well as efforts specific to gender. Based on previous research, there is seemingly a gap in physical activity within children aged 11 to 14 years (Jago et al.). It appears that extended research is necessary on middle school age students in order to discover why and when (related to grade level) this disparity exists in adolescence. This research can aid in a collaborative effort to reverse the unhealthy trends of physical inactivity. Therefore, the purpose of this investigation was twofold: 1) to



identify a significant gap in physical activity levels between females versus males and 2) to identify the age/grade in which the projected discrepancy develops.

### **Hypotheses**

The following research hypotheses were tested:

1. There will be a significant difference in the amount of PA in which middle school aged males participate versus the amount of PA in which middle school age females participate. Overall, females will report lower levels of PA.
2. The difference between genders will be most significantly identified in participants enrolled in the 8<sup>th</sup> grade.

### **Delimitations**

The study was delimited by the following:

1. Only students between the ages of 11 to 14 years were included in the study.
2. The study was conducted in a small charter school in southeastern United States.
3. The measure used to assess PA was a self-report, subjective measure.
4. The study was conducted in winter; all activities in question may not have been available to the participants.

### **Limitations**

The study was limited by the following:

1. The participants may have made self-report or recall errors on the PAQ-C questionnaire.
2. The final sample size was relatively small due to the small population of the school and the number of consent and assent forms that were returned from each participant.

## **Definition of Terms**

For the purpose of this study, the following terms were operationally defined:

**Physical activity.** Any intentional movement that expends energy; movement must increase the heart rate and cause heavier than normal respiration. The physical activity must satisfy the age requirement for duration of at least 60 minutes per day (CDC, 2015b).

**Middle school age student.** A middle school age student for the purpose of this study refers to students that are enrolled in a public middle school. The students must be enrolled in grades 6<sup>th</sup>, 7<sup>th</sup> or 8<sup>th</sup>. The typical age range for a middle school age student is between 11 and 14 years.

**Gender disparity.** For the purpose of this study, any notable difference related to physical activity that distinguishes male adolescents from female adolescents.

**Screen time.** For the purpose of this study, any viewing of media with a screen. Activities such as television, videos, computer, or video games would apply (Wethington, Pan, & Sherry, 2013).

## Chapter 2

### Review of Literature

#### Introduction

In recent years, researchers have identified the importance of physical activity (PA) on adolescent development (Janz et al., 2014; Pan, Sherry, Park, & Blanck, 2013; Reillo, Vlahov, Bohren, Leppo, & Davis, 2010; Wethington et al., 2013). While the importance of this development has emerged, a disparity among gender has also been revealed. Research has been conducted to identify this gender disparity (Jago et al., 2005; Lenhart et al., 2012). Adolescent gender disparity as it relates to general levels of PA has recently become a widely studied topic. Although the literature covers a variety of theories surrounding adolescent gender disparity, this review will focus specifically on four major themes, which emerge repeatedly throughout the literature reviewed. Themes included are: 1) the importance of physical activity to adolescent development, 2) the gender disparity between general levels of physical activity, 3) contributing factors to gender disparity, and 4) assessment tools related to general levels of physical activity.

When considering gender research as it relates to PA, researchers must consider the source or timeline of the suggested disparity, and implement a plan to reverse the trends. Understanding the importance of PA to the development of adolescents, the gender disparity present between males and females, the contributing factors to this difference, and various methods of assessing PA, will all combine to validate the importance of studying energy expenditure in adolescents.

## **Importance of Physical Activity to Adolescent Development**

The importance of PA as it relates to adolescent development is substantial. The physical benefits of an adolescent being more physically active can directly impact the future health of that individual. In 2014, Janz et al. examined the benefits of PA by reviewing the relation of bone strength and PA. During his longitudinal study, Janz et al. researched 530 participants at ages 5, 8, 11, 13, 15, and again at 17. Each participant wore an accelerometer for three to five days. There were multiple clinical tests conducted at multiple sites in order to track bone stress and bending strength.

The findings of the Janz et al. (2014) study indicated higher levels of PA during childhood are associated with greater bone strength in both male and female participants. Although there was a marked decrease in the levels of PA during adolescence for each group tested, ultimately the results revealed that higher PA levels in adolescence are associated with greater bone strength in young adulthood. The main impact of the findings of this study is the association of bone strength to PA, which highlights the importance of the role that PA plays in physical development.

In a similar longitudinal study based on the developmental relationship between motor skills and physical fitness, Reillo et al. (2010) sought to identify a relationship between motor skill proficiency among preschool children and the level of physical fitness in adolescence. Researchers also explored the implications of established motor patterns on longitudinal physical fitness levels. In the study, a physical assessment of gross motor development was administered to 140 preschool children between the ages of 4 and 6. Ten years later, an overall fitness test was administered to the 140 original participants who were then 14 to 16 years of age. The fitness test evaluated

cardiorespiratory fitness, muscular fitness, flexibility, and body composition. The researchers' purpose for the study was to discover a correlation between the level of gross motor development as a preschool student and the level of fitness as an adolescent.

The results analyzed by Reillo et al. (2010) suggested that proficiency levels in gross motor development were predictive of the level of physical fitness in adolescence. Individuals who were classified as "proficient" in locomotor and manipulative skills by the first assessment and the second assessment, indicated primary motor cortex development, muscle composition, and coordination required to perform locomotor skills. The findings displayed the positive impact of PA in early childhood. This early practice of PA can lead to embedded behaviors that encourage a positive response to energy expenditure in adolescence.

Discussing the positive impact of increased levels of PA on motor development is just as important as the recognition of the negative impact that low levels of PA can have on adolescent children. In 2013, Pan et al. conducted a study that analyzed the association between childhood obesity and attendance in schools. A sample of 3,470 U.S. adolescents ranging in age from 12-17 years old was studied using a survey. Reported number of absences, reported number of sick days, and body mass index were all calculated based on parent/guardian reports. Weight status was calculated based on the sex-specific body mass index-for-age percentile.

Pan et al. (2013) sought to determine if the implications of childhood obesity are potentially associated with school absenteeism due to illness or injury. The results indicated that students who were classified as overweight and obese had 36% and 37% more sick days reported than students who were classified as having normal weight. This

study highlights the impact on mental development during adolescence due to missed opportunities because of absenteeism. If adolescents who are overweight and obese are missing more than one-third more school days due to health reasons than those of healthy weight students, there is a greater chance that these students have missed content that is vital to mental development. The results of this study emphasize how important it is for health professionals, educators, and parents to make attempts to prevent obesity during adolescence in order to promote overall development.

In a study also related to obesity, Wethington et al. (2013) investigated the association of screen time and obesity in school-aged children. Utilizing the 2007 National Survey of Children's Health data that was collected by the CDC, the researchers gathered information on 91,642 children ranging in age from birth to 17 years of age. The research was based on parent/guardian reporting. The parent or guardian who knew most about the child's health was selected as the respondent. The researchers analyzed data from the screen-time questions that were asked of the 6 to 11-year-olds and the 12 to 17-year-old participants. Based on data exclusions, the final total participants aged 6 to 11 years was 23,416 and 29,005 for participants aged 12 to 17 years. Body mass index was identified and classified based on the reported height, weight, and age of each individual.

The Wethington et al. (2013) results denoted that over 20% of 6 to 11-year-old participants engaged in more than two hours of screen time per day. In the 12 to 17-year-old group, 26% reported excessive screen time, which exceeded two hours per day. In both populations, the results indicated that those who did not participate in exercise the week prior to the study had a higher prevalence of screen time. In regards to obesity, results revealed that both excess screen time and having a television in the child's

bedroom were associated with increased rates of obesity. Based on the findings, it is important to note the lack of socialization and development as a result of increased screen time. The physical development of youth is impacted greatly by excess screen time.

The research has consistently demonstrated the importance of increased PA levels in adolescence as well as highlighting the many barriers that are negatively impacting activity levels in youth. Examining PA levels on a more specific scale is pertinent to identifying and implementing plans that will reverse unhealthy trends.

### **Gender Disparity Among General Levels of Physical Activity**

The theory that there is a large disparity across gender for participation in PA has been evident in several research studies. To expand on the knowledge of these differences, Jago et al. (2005) examined the differences in activity patterns as they relate to gender and time of day. Eighty-one participants from a middle school in Texas were introduced to the study during normal school hours. Physical activity was measured objectively using accelerometers. Each participant was to wear the monitor from Thursday through Sunday. The days were chosen in order to collect data on two week days and two weekend days. Each participant was also required to record in a PA journal.

After all the data were collected and analyzed, Jago et al. (2005) discovered that male subjects were more active than females across all four days. The late afternoon period of Thursday and Saturday revealed the most significant difference in active and sedentary behaviors. Males were much more active than the female participants during this time period. On all four days, the male subjects participated in over two times more moderate/vigorous activity than the female subjects. One of the most significant result was the female participants did not reach the Surgeon General's recommended minimum

time for activity (30 minutes) on any day of the study. This data exemplifies the large disparity in PA levels among adolescent individuals.

In a 2015 study measuring similar outcomes, Lazarevic, Orlic, Lazarevic, and Janic sought to identify early adolescent student attitudes toward physical education (PE). The basis of this study was the theory that a more positive attitude toward physical education is connected with the engagement of the student and the development of an active lifestyle. The survey-based research included 531 middle school aged students. The students completed the survey during physical education class period.

Following data collection and processing, Lazarevic et al. (2015) found that student gender and age affected attitudes about physical education. Male students were identified as having more positive feelings toward physical education. The male students reported that they experienced physical education as a source of enjoyment and usefulness. The female students reported less enjoyment due to the content of the physical education classes. In regard to grade level, 6<sup>th</sup> grade students experienced much more enjoyment and usefulness in physical education class compared to that of 7<sup>th</sup> grade and 8<sup>th</sup> grade. The Lazarevic et al. study was key to identifying inconsistencies in the attitudes toward physical education and PA.

In regards to examining the role of gender in relation to being physically active, Haugen, Johansen, and Ommundsen (2014) conducted a study in which a self-report questionnaire was administered to 2,055 Norwegian adolescents. The purpose of the research was to determine if PA affected the psychological conditions of adolescents. The class instructor administered and supervised the self-report questionnaire during school



hours. The questionnaire explored areas of psychological distress, body image, and physical activity.

According to Haugen et al. (2014), the results indicated that the female participants reported higher levels of both psychological distress and investment in appearance. There was a suggested effect of PA on psychological distress. Higher levels of PA led to a greater likelihood of positive appearance evaluation. The researchers uncovered that females seemed to benefit more from higher self-perception. Related to this, higher self-perception correlated to higher levels of PA, which suggests the more physically active female adolescents have a higher self-perception and self-concept.

A study completed by Lenhart et al. (2012) also helped illustrate the idea there is a gap in how much PA females are receiving versus males during adolescence. The purpose was to investigate participation in physical education class and sports teams and how that may relate to levels of PA for females and males. The participants included 591 students from 47 different high schools in the Philadelphia area. All participants were enrolled in 9<sup>th</sup>-12<sup>th</sup> grade. The survey consisted of a pen and paper survey that was administered during the school day. The confidential questionnaire inquired about drug use, fruit and vegetable consumption, screen time, physical education classes, and general physical activity levels.

The findings supported the initial hypothesis that males were more likely to be active than females. Lenhart et al. (2012) discovered a greater percentage of females reported being sedentary and a greater percentage of males reported being highly active. In addition, the individuals who were on sports teams reported much higher PA levels

than those who did not participate in organized sports. The female participants in the study were found to be less likely to participate in PA during leisure time than males.

In addition to the research identifying the discrepancy in PA levels in both male and female adolescents, Yungblut, Schinke, and McGannon (2012) considered female adolescent feelings toward PA in their research. This particular analysis was conducted as a forum in northern Canada. Due to age differences, the participants were divided in two categories. Fifteen participants made up the early adolescent unit, which ranged in age 12 to 14 years. There were 20 participants in the mid-to-late adolescent cohort, which included females 15 to 18 years of age. Each participant was involved in at least one interview and one focus group. The average time to each interview and focus group was 45 minutes.

Upon interview completions and data analysis, Yungblut et al. (2012) discovered that females had relatively negative views on participation in PA. Individuals in both groups expressed their concern with looking or feeling as though they look “gross” when they participate in PA. Across cohorts, there was agreement that wanting to look good became more important to females in early adolescence. There were expressed concerns that it was difficult to maintain a feminine image while participating in PA. The results in this study provide insight on the social and cultural expectation that females are feeling in early adolescence. These pressures can likely mount to disengagement in PA both in a short-term and a long-term sense.

To further explore the adolescent female aversion to PA, Slater and Tiggemann (2010) examined the reasons females did not participate in sport and other physical activities at the same rate as males. The Slater and Tiggemann study was similar in

format to that of the Yungblut et al. (2012) study in that it was interview based research. The participants were 49 Australian females between the ages of 13 and 15 years. The participants were divided into six focus groups in order to promote confidence in responding.

Following the focus group conversations, Slater and Tiggemann (2010) gathered all tape recordings, notes, and transcripts of each discussion and analyzed the themes and ideas. After examining the varying answers for the question of why females do not play or stop playing as many sports as males, six themes were discovered. Themes identified were as follows: participants cited it is not considered feminine for girls to play sport, there were more important social activities (such as “hanging out with friends”) for females to participate in, females were more involved in their studies and therefore did not have the time to participate in sports, there were not as many sporting options available for females, issues with body image, and the issue that sports become too competitive and not as much fun to participate in. All of the themes of this study are representative of a major disparity during adolescence of general levels of PA across genders.

### **Factors That Contribute to Gender Disparity**

While previous studies have discussed the apparent gender disparity in adolescent PA levels, other researchers have investigated the potential factors that contribute to this disparity. Marques, Martins, Sarmiento, Rocha, and Carreiro da Costa (2015) conducted a study, which analyzed the awareness of PA recommendations for older adolescents. The participants included 2,718 Portuguese students enrolled in the 12<sup>th</sup> grade. The survey-based research sought to gain an understanding of the student’s knowledge of the

recommended guidelines for PA by asking a series of questions with likert scale response options.

As reported by Marques et al. (2015), only 16.2% of all students tested identified that PA is recommended daily. The recommendation that PA should last at least 60 minutes a day for adolescents was correctly reported by 43.5% of students. The correct response was significantly higher for males for this question. After all the data were gathered, researchers described that a staggering 3.6% of participants were able to correctly identify all of the recommendations for PA. The results of this study suggest that the lack of knowledge about PA parameters could be a contributing factor to the shortage of adolescents that meet daily PA recommendations.

In 2011, Slater and Tiggemann sought to study the issues that may arise for adolescents in sport participation. Utilizing a sample of 714 Australian adolescents between the ages of 12 and 16 years, researchers administered multiple surveys inquiring about the student's participation in sports, their experience with teasing while playing sports, their body image while playing sports, and their self objectification.

Slater and Tiggemann (2011) discovered that females participated in organized sports at a lower rate than that of male participants. Researchers also discovered that while both males and females reported levels of being teased by same-sex peers, the female participants reported significantly higher levels of teasing both from same-sex peers and opposite-sex peers. Females also reported being teased for their performance in sport as well as being called names relating to size or weight more often than males. In relation to body image, researchers found that appearance anxiety was significantly

higher for the female participants than the males. The results highlight areas for concern that could contribute to the adolescent gender disparity in PA participation.

Additionally, Edwardson, Gorely, Pearson, and Atkin (2013) examined gender differences related to social support. The study consisted of 328 adolescent males and females between the ages of 12 and 16 years. Participants were recruited from three secondary schools in central England. A combination of survey and objective PA measures were utilized to collect data. Participants completed the Activity Support Scale and they wore an accelerometer for seven consecutive days.

The objective data reported by Edwardson et al. (2013) suggested that the male participants were more active in moderate/vigorous PA on the weekends, and younger adolescents participated in PA more frequently after school. The social support data collected revealed that all participants reported higher levels of activity support from peers than other sources such as family, parents, and siblings. It was also noted that males perceived more peer support than females. The results indicate that there may be a need to approach intervention programs from the in-group perspective in order to increase PA levels in adolescents.

Similarly, Reimers, Jekauc, Mess, Everke-Buchanan, and Woll (2010) examined the relationship parent modeling had on PA levels in adolescents. The participants consisted of 4,529 adolescents ranging in ages 4 to 17 years. German adolescents assessed their PA using self-report. Parental report was used for individuals between the ages 4 to 10. The questions asked were related to school setting, leisure time sport, and every day activity. Inquiries about how often the participant's parents were involved in regular PA were also a part of the research.

Following data collection, Reimers et al. (2010) determined that the males in the study participated in more leisure and club sport than the females. Both the mother's and father's PA levels were significant in forecasting the adolescents time spent in club and leisure sport. Interestingly, as the adolescents' ages increased, the significance of the mother as a model for PA decreased. The father's significance as a model for PA increased for both male and female adolescents as the participants' age increased. The results of Reimers et al. study emphasize the importance of the role of the parent in encouraging an active lifestyle.

While an understanding of the roles friends and family play is significant to identify contributing factors to the lack of PA during adolescence, understanding what motivates individuals to be physically active is of importance as well. In 2013, Iannotti et al. examined the difference in motivational factors as they related to participation in PA. The survey-based research recruited students from seven different countries using the 2005-2006 Health Behavior in School-Aged Children study. Participants were 11, 13, or 15 years of age, and represented one of three geographic regions: Eastern Europe, Western Europe, and North America.

The findings of Ianniotti et al. (2012) findings suggest that females reported significantly less PA levels in all three geographic regions than males. There were differences among all three geographic regions relating to health, social, and achievement motivation. Females reported lower "Social" and "Achievement" motivations than males. Overall health motivation did not seem to be a common motivating factor for adolescents to be physically active. This was contrary to what researchers believed. The importance

of the findings denote that varying motivation factors can have an impact on adolescents to chose to participate in PA.

Liu, Sun, Beets, and Probst (2013) also conducted a study relating to social implications of PA choices. The purpose of the research was to determine the natural groupings of leisure time PA choices. The data were taken from the 1991-2006 U.S. National Health and Nutrition Examination Survey. The subjects included 3,865 males and 3,641 females ranging in age from 12 to 19 years. The self-report survey is used to gather information on what types of physical activities individuals chose to participate in. This particular research focuses on collection of data for moderate-to-vigorous PA.

The results in Liu et al. (2013) study revealed that the majority of males participated in activities related to running and basketball while the majority of females participated in activities related to dancing, walking, and running. Participation in team sports was more frequently recorded for males than females. The results of this study indicate that female's tendency to choose fewer team activities could be a contributing factor to the disparity in participation in PA.

### **Assessment Tools Related to General Levels of Physical Activity**

Another significant piece of information to examine when investigating gender disparities as they relate to general PA levels is the methods in which PA levels are assessed. Fairclough, Boddy, Ridgers, Stratton, and Cumming (2011) researched this in a study, which sought to determine the influence of biological factors on varying PA assessments. The research included data gathered from 175 children ages 10 to 11 years from a large town northwest of England. Maturity status was determined based on height, sitting stature, leg length, and age. In order to measure PA objectively, each individual

wore accelerometers for five consecutive days. Participants were also given a log sheet to record the time the accelerometer was put on in the morning and the time it was removed at night. Any other reasons for taking off the accelerometer, such as water based activities, were also recorded. Self-report data were also collected using the Physical Activity Questionnaire for Older Children (PAQ-C) (Crocker, Bailey, Faulkner, Kowalski, & McGrath, 1997).

As Fairclough et al. (2011) expected, the results indicated that males reported higher scores than females on the PAQ-C. After analyzing accelerometer data, the male's increased activity levels were confirmed. When maturation was controlled for, significant differences among gender in the PAQ-C scores remained. The accelerometer data however seemed to show less significant differences among gender when biological maturity was controlled for.

In a similar, more recent study, Belcher et al. (2015) compared accelerometer-measured data to self-report data. Participants included 2,174 participants ages 12-19 years. Data were gathered from 2003-2006 National Health and Nutrition Examination Surveys. Self reported data included: age, sex, race/ethnicity, health status variables, and a questionnaire examining PA in the previous 30-day period. Participants wore the accelerometer for seven days. Upon review of the data, Belcher et al. concluded that the accelerometer-measured activity had a stronger correlation with the general health measures. These findings support previous research that indicate when objective measures of PA are compared to self-report, subjective measures, the objective measures seem to be more valid and reliable.



In 2012, Storey and McCargar assessed the reliability and validity of web-based data collection and on-site data collection. Participants aged 11 to 15 years completed the Web-SPAN web-based assessment twice, as well as participated in the on-site data collection. The on-site assessments included height, weight, food records, pedometer records, the PAQ-C survey, and the shuttle run. Upon all data collection, the results revealed strong correlations between the web-based data collected and the on-site data collected. The results signify the cost and time benefits of assessing PA levels with web-based data collection methods. Adolescents are likely more familiar with computer technology and likely prefer web-based data collection to on-site assessments.

Janz, Lutchy, Wenthe, and Levy (2008) also conducted a study comparing assessment methods of PA. Researchers examined the validity and reliability of two similar data collection tools. The Physical Activity Questionnaire for Older Children (PAQ-C) and the Physical Activity Questionnaire for Adolescents (PAQ-A) were the measurements utilized in this longitudinal study. The adolescents involved in the study took the PAQ-C at age 11 years and the PAQ-A at age 13 years. In order to ensure validity, prior to taking the questionnaire, the participants wore activity monitors. The activity monitor data were compared to the questionnaire data upon data collection. Results indicated high levels of validity for the PAQ-A when compared with the activity monitor data. Cronbach alpha scores that ranged from 0.72 to 0.88 for the PAQ-C and the PAQ-A reported high levels of internal consistency. PAQ-A questions seemed to be consistently more reliable than that of PAQ-C. Researchers suggested that the reasoning behind this was due to the older age and mental maturity of the PAQ-A participants. Overall, the ease-of-use and brief time it took to complete each questionnaire makes the

PAQ-C and PAQ-A desirable methods for assessing general levels of physical activity.

### **Conclusion**

The research conducted in the recent past has provided insight to explain the importance of PA to adolescent development (Janz et al., 2014; Pan et al., 2013; Reillo et al., 2010; Wethington et al., 2013). Vast physical, mental, social, and emotional disparities relating to PA levels have been discovered in previous research (Haugen et al., 2014; Jago et al., 2005; Lenhart et al., 2012; Lazarevic et al., 2015; Slater & Tiggemann, 2010; Yungblut et al., 2012). Many researchers have provided insights as to what the contributing factors to the gender disparity could be (Edwardson et al., 2013; Ianniotti et al., 2013; Liu et al., 2013; Marques et al., 2015; Reimers, et al., 2010; Slater & Tiggemann, 2011). Currently, limited research is available to suggest at what age in adolescence the major differences in frequency of PA are occurring. Additional research is needed in this area of study in order to provide insight on implementation of intervention programs.

## Chapter 3

### Methods and Procedures

The purpose of this study was to identify a significant divide in physical activity (PA) levels between males and females. This research also aimed to identify an age at which the projected discrepancy is most prominent. The participants as a whole may not achieve the suggested levels of PA, but there are expected lower levels of participation PA in the female subjects than the male subjects. There is also a projected age range of 13 to 14 when the divide between PA participation is the highest. Uncovering an age range in which PA levels decrease could significantly impact methods to address the issue and prevent unhealthy behavior habits in adolescence.

#### Participants

The participants involved in this study were 92 middle school age females and males located in the southeastern United States. Of the 92 participants, 52% (N=48) were female, and 48% were male (N=44). Of the total participants, 32.6% (N=30) were enrolled in the 6<sup>th</sup> grade, 34.8% (N=32) in the 7<sup>th</sup> grade, and 32.6% (N=30) in the 8<sup>th</sup> grade. All of the participants of the study were recruited on a volunteer basis and signed minor assent forms prior to data collection. Parent/guardian consent forms were also signed and collected prior to participation in the study. Prior to the study, university Institutional Review Board approval was given. Permission was also obtained from the principal at the middle school in which the research study was conducted. A background check was required in order for researchers to meet school approval guidelines for researchers conducting site visits. The middle school administered the background check prior to researchers first visit.

### **Context of the Setting**

This study took place in a public charter school in the southeastern United States. The original research design included multiple public middle schools in a school district in southeastern United States, but due to inaccessibility, the final data were collected at only the public charter school setting. Research took place during each participant's physical education class. Twenty-four percent of the students attending the institution qualify for the free or reduced lunch program, which indicates the student's that attend are classified as medium to high socioeconomic status. The middle school used for research has an enrollment of 380 students in grades 6<sup>th</sup>, 7<sup>th</sup>, or 8<sup>th</sup>. Forty-four percent (N=169) of the school's population is female, while 56% (N=211) are male. The student demographic report on ethnicity reveals the students enrolled are 76% (N=287) Caucasian, 17% (N=63) African American, 3% (N=13) Hispanic, and 4% of students (N=17) answered other. Of the 380 total students in the school, 165 were currently enrolled in physical education during the time of the study. Physical education occurs in a 50-minute class period Monday-Friday. Daily physical education is rare in the local school district schools. All students enrolled in the school are required to take physical education one semester each year of middle school.

### **Research Design**

Non-experimental descriptive design using a survey was conducted during normal school hours. Research was gathered using the Physical Activity Questionnaire for Older Children (PAQ-C), which is a pencil-and-paper survey that contained age-appropriate language for middle school age participants. The PAQ-C was designed for children 8-14 years old and was written to meet the reading level of children. Reliability for the PAQ-C

using Cronbach alphas ranging from 0.79 to 0.89 represents good internal consistency. Each participant completed the survey during his/her physical education class.

### **Procedures**

The research was conducted in a middle school setting in early 2016. The participants were recruited during an initial site visit to their physical education class. On the first site visit, the parent/guardian permission form was explained and distributed to each student enrolled in physical education (See Appendix B). There were 165 parent/guardian forms distributed. The physical education teacher assisted in collection of this form as it was signed and returned from the student. After seven days, researcher made a second visit to the physical education classes in order to collect the parent consent forms. Out of the 165 forms distributed, 92 forms were returned (56% return rate). After all parent consent forms were collected and organized by class, a third and final visit to the school occurred. During the last visit, Assent to Participate in a Research Study and the questionnaire were distributed and administered (See Appendix C). The minor assent form was only given to those students who also had a signed parent consent form on file. Students who did not have a signed parent consent form were moved to another area of the classroom to begin stretching in preparation for the class. Once each minor assent form was collected, the students were invited to complete the physical activity questionnaire. During the data collection phase, the material was stored in a locked cabinet inside of a university office. Data will be kept for two years in a secure place and then will be destroyed. All participants were informed of the researcher's contact information in the event that the participants wished to access the results upon completion of the study. Per request, and to honor the reciprocity with the school,

researchers will share the results of the study with the school principal and physical educators after all data are collected and analyzed.

### **Data Analysis**

Information regarding general levels of PA within the last seven days was recorded and analyzed using the SPSS Statistics program V.22 (IBM Corporation, Armonk, NY). Descriptive statistics were calculated using the participants' reported age, grade enrolled, and gender. One-way ANOVA tests were performed to determine variations in levels of PA between males and females as well as variations across grade levels. The analysis examined differences in activity levels during physical education, activity levels right after school, activity levels in the evenings, activity levels during the weekends, and an overall self-report of activity levels.

## Chapter 4

### Journal Manuscript

#### Introduction

Adolescent participation in physical activity (PA) has been studied extensively over the last 35 years. Research has uncovered that obesity trends throughout adolescence have consistently been on the rise. In contrast, significant declines in PA levels have been noted. Due to the possible health implications, many campaigns have been launched in order to address these unhealthy trends. Perhaps the two most identifiable campaigns to address the lack of PA adolescents, are the NFL Play 60 campaign introduced in 2007 and the Let's Move initiative launched by First Lady, Michelle Obama in 2010 (NFL Play 60, 2007; Let's Move, 2010). Each campaign has added to the recognition of the lack of participation in PA among adolescents.

Although a variety of research has been conducted on the implications of the decreased levels of PA, theories are mixed on when the rapid decline of participation in PA is occurring. By examining PA trends, researchers have found a discrepancy in the activity levels of male versus female. A greater percentage of adolescent males reported being highly active, while a greater percentage of adolescent females reported more frequent sedentary behavior in several previous studies (Jago et al. 2005; Lenhart et al., 2012). Utilizing this data, researchers can concentrate efforts to increase PA levels based on gender. Based on previous research, there appears to be a gap in PA levels between children ages 11 to 14 years (Jago et al.). Discovering why this disparity exists as well as when significant changes are occurring, can aid in a collaborative effort to reverse these unhealthy trends. Therefore, the purpose of this investigation was twofold: 1) to identify

a significant gap in PA levels between females to males and 2) to identify the age/grade in which the projected discrepancy develops.

### **Methods**

This study took place in a public charter school in the southeastern United States. The original research design included multiple public middle schools in a school district in southeastern United States, but due to inaccessibility, the final data were collected at only the public charter school setting. Research took place during each participant's physical education class. Data were collected during normal school hours in the participants' physical education classes. Research was gathered using the PAQ-C, a survey used to assess general levels of PA during the previous week. Each participant included in the study was enrolled in 6<sup>th</sup>, 7<sup>th</sup> or 8<sup>th</sup> grade and all were currently enrolled in physical education class. Informed parent/guardian consent as well as signed child assent was collected prior to research.

### **Subjects**

A sample of 92 middle school age students (48 females and 44 males) served as participants. All participants were recruited on a volunteer basis. The middle school used for research has an enrollment of 380 students in grades 6<sup>th</sup>, 7<sup>th</sup>, or 8<sup>th</sup>. Forty-four percent (N=169) of the school's population is female, while 56% (N=211) are male.

### **Procedures**

The research was conducted in early 2016. The participants were recruited during an initial site visit during their physical education class. On the first site visit, the parent/guardian permission form was explained and distributed to each student enrolled in physical education. After seven days, the researcher made a second visit to the physical



education classes in order to collect the parent consent forms. After all parent consent forms were collected and organized by class, a third and final visit to the school occurred. During the last visit, the child assent form and the PAQ-C were distributed and administered. The PAQ-C is a self-administered, seven-day recall questionnaire that measures general levels of PA with internal validity ranging from 0.79 to 0.89 (Crocker, Bailey, Faulkner, Kowalski, & McGrath, 1997). The minor assent form was only given to those students who also had a signed parent consent form on file. Once each minor assent form was collected, the students were invited to complete the research questionnaire. Upon completion of the questionnaire, the data collection was complete for each participant.

### **Statistical Analysis**

Information regarding general levels of PA within the last seven days was recorded using the research questionnaire and analyzed using the SPSS Statistics program V.22 IBM Corporation (Armonk, NY). Descriptive statistics were calculated using the participants' reported age, grade enrolled, and gender. A one-way ANOVA was performed to determine differences in the participant's general levels of PA by gender. The results indicated there were significant differences between genders for activity performed during physical education, for activity performed directly after school, for activity levels during the evenings, and for activity levels during the weekend. Significant differences were present between grade levels for activity performed directly after school, and for activity performed during the weekend. When participants were questioned about their overall activity levels, there were not significant differences in the data. This contrast highlights the limitation of self-report data.

## Results

A one-way between subjects ANOVA was conducted to compare the effects of gender and grade level on frequency of activity during physical education class. The results indicate there was a significant effect of gender on frequency of activity in physical education class, but there was no significant effect of grade level on frequency of activity in physical education class.

Tests were also conducted to compare the effect of gender and grade level on PA levels right after school. The results based on gender indicate there was a significant effect of gender on PA levels right after school. The results based on grade level indicate there was also a significant effect of grade level on PA levels right after school. Follow-up test for grade level indicate the difference in PA levels right after school is between 6<sup>th</sup> grade and 8<sup>th</sup> grade participants with 6<sup>th</sup> grade having more activity than 8<sup>th</sup> grade according to Welch's *t*-test,  $t(52.874) = 2.2398, p < .001$ .

Data analysis also compared the effects of gender and grade level on frequency of PA during the evenings. The results indicate there was a significant effect of gender on frequency of PA during the evenings, but no significant effect of grade level on frequency of PA during the evenings.

One-way between subjects ANOVA tests were conducted to compare the effect of gender and grade level on PA levels during the weekend. The results based on gender indicate there was a significant effect of gender on PA levels during the weekend. The results based on grade level indicate there was a significant effect of grade level on PA levels during the weekend. Follow-up test for grade level reveal the difference in PA

levels during the weekend was between 6<sup>th</sup> grade and 7<sup>th</sup> grade subjects as well as 6<sup>th</sup> grade and 8<sup>th</sup> grade subjects.

Analysis was conducted to compare the effects of gender and grade level on overall levels of PA during the seven days prior to testing. The results indicate there was no significant effect of gender or grade level on PA. Taken together, these results suggest that for this reporting, gender nor grade level had an effect on the overall frequency of PA the subjects participated in. These results are in contrast to the previous results, which highlight the limitation of self-reported, recall-based data.

### **Participant Demographics**

Table 1 provides descriptive statistics for the number of participants included in the study. The mean age of the participants was 12.5 years. Of the 92 participants, 44 were male and 48 were female. Thirty participants were enrolled in the 6<sup>th</sup> grade, 32 participants were enrolled in the 7<sup>th</sup> grade, and 30 participants were enrolled in the 8<sup>th</sup> grade. Race and ethnicity reports for the total students enrolled reflect that 76% (N=287) of students are Caucasian, 17% (N=63) are African American, 3% (N=13) are Hispanic, and 4% of students (N=17) answered other. Twenty-four percent of the students attending the institution qualify for the free or reduced lunch program, which indicates the school is classified as medium to high socioeconomic status. All participants were enrolled in physical education throughout the study.

### **Discussion**

The purpose of this study was to determine if there was a difference in overall PA levels between males and females. Researchers also wanted to identify at what age this difference seemed to be most prominent. After research was conducted on 92 middle

school age students in a public charter school, the results indicated there were significant differences between genders for activity performed during physical education, for activity performed directly after school, for activity levels during the evenings, and for activity levels during the weekend. Significant differences were present between grade levels for activity performed directly after school, and for activity performed during the weekend.

Past research that has indicated a disparity among genders in the level of PA males and females participate in is supported by the data collected in this study (Jago et al., 2005; Lenhart et al., 2012). The participants in this study seem to have similar variances in PA levels to that of previous research. The males and females differed in PA levels relating to physical education, after school, evenings, and weekends. This means that males and females reported varying levels of PA across all specific time periods.

Another area of interest for researchers was to identify the grade at which this suggested gap in PA occurs. Interestingly, subjects differed by grade level in PA that occurred directly after school and on the weekends. In regards to PA occurring directly after school, the subjects in 6<sup>th</sup> grade reported participating in more PA than the subjects in 8<sup>th</sup> grade. These results support the original hypothesis that the differences between activity levels directly after school are most clear in the 8<sup>th</sup> grade participants. The 6<sup>th</sup> grade participants are more active than the 8<sup>th</sup> grade participants after school. The results also revealed that there was a significant difference in levels of PA between grade levels for PA that occurred during the weekend. Subjects enrolled in 6<sup>th</sup> grade participated in more activity during the weekend than that of those enrolled in 7<sup>th</sup> and 8<sup>th</sup> grade. This data suggests that on the weekends, 6<sup>th</sup> graders were more active than any other grade

level. The results relating to grade level are interesting based on the specificity to time of day and week.

Overall, the results of this study are similar to findings in previous research. In 2005, Jago et al. examined the differences in activity patterns as they relate to gender and time of day. The results revealed that the evening period of Thursday and Saturday showed the most significant difference in active and sedentary behaviors. Although the Jago et al. study was examining gender, there is a similarity in that individuals were more active on the weekend day and after school. Another study that had similar results to the current study is the Lazarevic et al. (2015) study. This particular study sought to identify early adolescent student attitudes toward physical education. Researchers suggested that a more positive attitude toward physical education could be connected with the engagement of the student and the development of an active lifestyle. Researchers found that student age and grade level affected attitudes about physical education. Results revealed that 6<sup>th</sup> grade students experienced much more enjoyment and usefulness in physical education class compared to that of 7<sup>th</sup> grade and 8<sup>th</sup> grade. The current study supports the Lazarevic et al. hypothesis that higher attitudes of enjoyment could lead to higher activity levels. The 6<sup>th</sup> grade students in the current study were more active than the 7<sup>th</sup> and 8<sup>th</sup> grade students.

One of the reasons we did not see a difference in grade level for physical education could be due to the frequency of physical education in this setting. For this particular school, all students are required to take physical education for one semester each year they are enrolled in middle school. Physical education last for 50 minutes and is held Monday-Friday. Each student receives 250 minutes of physical education each

week. Physical activity becomes an expectation during physical education, which then encourages healthy habits over the course of time. Embedding physical education into the daily curriculum appears to be a successful way to encourage PA during school hours for students of all ages. .

The limitations that were present in this study are important to note. The data were self-report surveys. Therefore, it is possible that unreliable recall in reporting could have impacted the results. Because some of the results indicated a significant difference between gender and grade level and some did not, the limitation of self-report is an important issue to note. The overall measure for PA did not show a significant difference while a significant difference in either grade or gender was identified for each specific content question. One theory for these contrasting results may be due to the difficulty for adolescents to think and recall in an abstract way. For example, it may be more difficult for adolescents to determine how much PA they completed over the course of an entire week, but instead are more accurate in recall in a directed, specific way (i.e., how much physical activity are you doing in physical education”). The limited recall, as well as self-report limitations could be possible explanations for the conflicting results. When subjects reported on specific PA participation, there was a significant difference between genders for each data set.

Self-report data collection was the most practical method for this study. One way to ensure data were objective would have been to utilize activity monitors or accelerometers. In this particular study, it was not feasible to gather data in that format. Researchers spent limited time in the school setting in order to minimize interference with the student’s daily physical education class. Because research cost and time was

limited, the use of accelerometers was not a feasible option. Therefore, it was assumed that each participant answered the questionnaire to the best of their ability, and data collected was valid and reliable.

Due to the results not being consistent question by question, further research is needed on this sample on the overall PA levels throughout the week. Including a larger sample size in further research designs would assist in application of results. The present study utilized only a subjective measure of PA. Including an objective measure to accompany the PAQ-C would give more insight into the details of adolescent PA patterns in future research studies.

### **Practical Application**

This research is beneficial to school boards, school administrators, and physical educators. The results indicate that there is a gender disparity as well as a grade level disparity in the amount of PA middle school age students are receiving. By implementing programs to prevent unhealthy habits from forming, overall health and activity levels may increase. Another benefit to the research is the measurement used to examine student behaviors. While these specific results may not be able to be generalized to any other schools or districts, the testing procedures can be replicated for minimal costs to the school. Physical educators can learn about the habit of the individuals in their particular school. Examining the varying activities that may present a gender gap as well as looking at the age disparity can give physical educators great insight into what types of programs need to occur. As physical educators, we want our students to be as active as possible, not only while in our class but outside of class too. By identifying that the female

students and older students need to be more active, educators can design lessons and units to suit the needs for these specific populations.



## Appendices

## Appendix A

## IRB Forms

Revised 07/05/2013

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IRB # [REDACTED]  
TO BE COMPLETED BY SPAR

## Winthrop University

REQUEST FOR REVIEW OF RESEARCH INVOLVING HUMAN SUBJECTS  
Institutional Review Board

|   |  |
|---|--|
| RESEARCHER of RECORD: Casey Reeves<br>COLLEGE/DEPARTMENT: PESH<br>PHONE NUMBER: HOME: n/a WORK: n/a<br>EMAIL: reevesc2@winthrop.edu CELL PHONE:<br>***_***_****<br>ADDRESS: [REDACTED]<br><br>STATUS: <input type="checkbox"/> Faculty or Staff<br>(If a student, complete faculty advisor section)<br><input checked="" type="checkbox"/> Graduate Student<br><input type="checkbox"/> Undergraduate Student | CO-RESEARCHERS: Drs. Kathy Davis, Janet Wojcik, David Schary<br><br>FACULTY ADVISOR: Dr. Kathy Davis<br>ADVISOR PHONE: HOME: n/a WORK: n/a<br>EMAIL: davis@winthrop.edu CELL PHONE: ***_***_****<br>ADDRESS: [REDACTED]  |
| TITLE OF RESEARCH: Gender Differences Relating to Physical Activity in Middle School Students   |  |
| DATES OF THE RESEARCH PROJECT:<br><br>Approval Requested for Start Date: 12/1/2015 (The requested start date should be at least 2 weeks after the next scheduled meeting of the IRB)<br><br>End Date: 12/1/2016 (Maximum of one year; must be renewed annually)   |  |
| IS THIS RESEARCH BEING FUNDED BY RESEARCH GRANT?<br><br><input type="checkbox"/> YES; Sponsor: [REDACTED]<br><input type="checkbox"/> Funding Applied for; Sponsor: [REDACTED]<br><input checked="" type="checkbox"/> NO  |  |
| 1.  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is this activity being carried out by student as a classroom assignment to be reviewed by the faculty member.<br><br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Will the information gathered or developed in this activity be used in a presentation or publication outside of the classroom?<br><br>If you checked yes to both questions above, please explain how the information will be used outside of the classroom: The information will be used in a thesis completed for my Master's Degree in Sport and Fitness Administration. The information will be used outside the classroom and submitted for presentation and publication. |
| 2.  | INDICATE THE TYPES OF MEMBERS OF THE RESEARCH TEAM WHO WILL HAVE DIRECT CONTACT WITH HUMAN SUBJECTS:<br><br><input type="checkbox"/> FACULTY MEMBER<br><input type="checkbox"/> STAFF MEMBER<br><input type="checkbox"/> UNDERGRADUATE STUDENT<br><input checked="" type="checkbox"/> GRADUATE STUDENT<br><input type="checkbox"/> OTHER; SPECIFY: [REDACTED]  |

|   |  |  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
|---|--|--|--|--|------------------------------|--|---|------------------------------|--|--|------------------------------|--|---|------------------------------|--|-----------------------------|---|--|--|---|-----------------------------|---|------------------------------|--|--------------|
| 3.                                      | <p>A. BRIEFLY DESCRIBE THE PURPOSE OF THE RESEARCH IN NON-TECHNICAL LANGUAGE: <b>The purpose of my research is to identify differences in levels of physical activity between male and female middle school-aged students.</b></p> <p>B. DESCRIBE RESEARCH PROTOCOL OR METHODOLOGY TO BE USED: <b>The method of research that will be used in survey/questionnaire based research. I will be using the PAQ-C questionnaire.</b></p>  |  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| 4.                                      | <p>EXPLAIN BRIEFLY BUT COMPLETELY WHAT TASKS OR ACTIVITIES THE SUBJECTS IN THIS RESEARCH WILL BE DOING (If a survey/questionnaire is to be used, state how many questions will be asked and the expected time to complete the survey): <b>This study will consist of a survey/questionnaire that each subject will complete. There are ten scale-based questions which will take approximately 15 minutes to complete. Prior to data collection, the school that will be used for research will be contacted and approval granted to utilize the middle school students that are enrolled in physical education. Upon the first visit to the school, parent consent will be sent home with each student. One week later, I will return and issue the child assent form to all students that brought back a parent consent form. After both forms have been collected and verified, the ten questions survey will be administered.</b></p>  |  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| 5.                                      | <p>DESCRIBE SUBJECTS FOR THIS RESEARCH, INCLUDING A STATEMENT OF WHO WILL BE RECRUITED AND THE ANTICIPATED POPULATION SIZE: <b>Middle school age students (6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grade) enrolled in York Preparatory Academy. The estimated population size is around 200.</b></p> <p>DO YOUR SUBJECTS INCLUDE ANY OF THE FOLLOWING:</p> <table border="0"> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Infants and children younger than 7 years?</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Institutionalized mentally impaired people?</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Students enrolled in your own classes?</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Students enrolled at Winthrop University?</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Prisoners?</td> </tr> <tr> <td><input checked="" type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Other special populations? Specify – <b>Middle-school students</b></td> </tr> </table>   | <input type="checkbox"/> Yes   | <input checked="" type="checkbox"/> No | Infants and children younger than 7 years?   | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Institutionalized mentally impaired people? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Students enrolled in your own classes? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Students enrolled at Winthrop University? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Prisoners?                  | <input checked="" type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Other special populations? Specify – <b>Middle-school students</b> |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Infants and children younger than 7 years?   |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Institutionalized mentally impaired people?  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Students enrolled in your own classes?   |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Students enrolled at Winthrop University?  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Prisoners?   |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input checked="" type="checkbox"/> Yes | <input checked="" type="checkbox"/> No   | Other special populations? Specify – <b>Middle-school students</b>   |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| 6.                                      | <p>DESCRIBE HOW SUBJECTS WILL BE RECRUITED FOR THIS RESEARCH: <b>Students will be recruited on a volunteer basis. I will attend each physical education class at one school in the district. Each student will have the opportunity to participate in the study.</b></p>   |  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| 7.                                      | <p>HOW WILL YOU ASSURE THAT PARTICIPATION OF THE SUBJECTS IS VOLUNTARY? <b>The use of parent consent form as well as student assent form. Only the students whose parents returned a consent form will be asked to sign assent.</b></p>  |  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| 8a.                                     | <p>CAN THE HUMAN SUBJECT BE DIRECTLY IDENTIFIED BY: <i>(For any responses of "yes" indicate in the space provided how the subject's privacy will be protected.)</i></p> <table border="0"> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Name on Response form: _____</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Photograph: _____</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Television/VCR/DVD tapes: _____</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Audiotape: _____</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Coded Research Forms: _____</td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Detailed Biographical Data: _____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td>Informed Consent, Assent or Parental Permission forms: <b>Participant signature on the Consent and Assent forms</b></td> </tr> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Other: _____</td> </tr> </table> | <input type="checkbox"/> Yes   | <input checked="" type="checkbox"/> No | Name on Response form: _____   | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Photograph: _____                           | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Television/VCR/DVD tapes: _____        | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Audiotape: _____                          | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Coded Research Forms: _____ | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | Detailed Biographical Data: _____                                  | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Informed Consent, Assent or Parental Permission forms: <b>Participant signature on the Consent and Assent forms</b> | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Other: _____ |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Name on Response form: _____   |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Photograph: _____  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Television/VCR/DVD tapes: _____  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Audiotape: _____   |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Coded Research Forms: _____  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Detailed Biographical Data: _____  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No  | Informed Consent, Assent or Parental Permission forms: <b>Participant signature on the Consent and Assent forms</b>              |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Other: _____   |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| 8b.                                     | <p>If you checked yes to any item in 8a: then:</p> <table border="0"> <tr> <td><input type="checkbox"/> Yes</td> <td><input checked="" type="checkbox"/> No</td> <td>Will personally identifiable data be shared with others outside of this research team? If you checked yes, please explain. _____</td> </tr> </table>  | <input type="checkbox"/> Yes   | <input checked="" type="checkbox"/> No | Will personally identifiable data be shared with others outside of this research team? If you checked yes, please explain. _____ |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No   | Will personally identifiable data be shared with others outside of this research team? If you checked yes, please explain. _____ |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |
| 9.                                      | <p>THE RESEARCHER SHALL MAKE EVERY POSSIBLE ATTEMPT TO MAINTAIN CONFIDENTIALITY OF THE RESEARCH</p>  |  |  |  |                              |  |   |                              |  |  |                              |  |   |                              |  |                             |   |  |  |   |                             |   |                              |  |              |

|     |   |
|-----|---|
|     | <p>AND THE HUMAN SUBJECTS. IF FOR SOME REASON, THE RESPONSES, INFORMATION, OR OBSERVATIONS OF THE SUBJECT BECAME KNOWN TO PERSONS OTHER THAN THE RESEARCHERS, COULD THIS INFORMATION POTENTIALLY PLACE THE SUBJECT AT RISK OF:</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No DAMAGE TO HIS/HER FINANCIAL STANDING?<br/> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No DAMAGE TO HIS/HER PRESENT OR FUTURE EMPLOYABILITY?<br/> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No CRIMINAL OR CIVIL LIABILITY?<br/> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No PSYCHOLOGICAL/EMOTIONAL PROBLEMS?</p> <p>EXPLAIN ANY "YES" ANSWERS AND STEPS THAT HAVE BEEN TAKE TO MINIMIZE RISK: [REDACTED]</p>  |
| 10. | <p>ARE ANY OF THE TECHNIQUES LISTED BELOW INVOLVED IN THE RESEARCH?</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No INVASIVE MEDICAL PROCEDURES?<br/> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No NON-INVASIVE MEDICAL PROCEDURES?<br/> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No STRENUOUS EXERCISE?<br/> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No OTHER PHYSICAL TESTING</p> <p>EXPLAIN ANY "YES" ANSWERS AND STEPS THAT HAVE BEEN TAKE TO MINIMIZE RISK: [REDACTED]</p>  |
| 11a | <p>DESCRIBE HOW LEGALLY EFFECTIVE INFORMED CONSENT WILL BE OBTAINED AND ATTACH A COPY OF THE CONSENT FORM. IF MINORS ARE TO BE USED AS RESEARCH SUBJECTS, DESCRIBE PROCEDURES USED TO GAIN CONSENT OF THEIR PARENT(S), GUARDIAN(S), OR LEGAL REPRESENTATIVE(S). I will first visit the school and send the parent consent form home with the students. With the help of the physical education instructor, the students will return the consent forms. On my second trip to the schools, I will collect the consent forms and distribute and collect the assent forms. If the students have consent and assent in both forms, they will able to participate in the study on my second trip to the school. If the student did not return both the assent and the consent form, they will be excluded from the study without penalty.</p>   |
| 11b | <p>WAIVER OF SIGNED INFORMED CONSENT REQUIREMENT</p> <p>TO REQUEST A WAIVER OF A SIGNED INFORMED CONSENT, COMPLETE THE FOLLOWING:</p> <p><input type="checkbox"/> The only record linking the subject and the research would be the consent document, and the principal risk will be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern. Section 46.117(c)1</p> <p><input type="checkbox"/> The research presents no more than minimal risk of harm to the subjects, and involves no procedures, for which written consent is normally required outside of the research context. Section 46.117(c)2</p> <p><input type="checkbox"/> The research or demonstration project is to be conducted by or subject to the approval of state or local government officials and is designed to study, evaluate, or otherwise examine (i)public benefit or service programs; (ii)procedures for obtaining benefits or services under these programs; (iii)possible changes in or alternatives to those programs or procedures; or (iv)possible changes in methods or levels of payment for benefits or services under those programs; and the research could not practicably be carried out without the waiver or alteration. Section 46.116(c)</p> <p><input type="checkbox"/> The research involves no more than minimal risk to the subjects, the waiver will not adversely affect the rights and welfare of the subjects, the research could not practicably be carried out without the waiver, and whenever appropriate, the subjects will be provided with additional pertinent information after participation. Section 46.116(d)</p> <p>In cases where the documentation requirement is waived, the IRB may require the</p> |

|     |   |   |
|-----|---|---|
|     | investigator to provide subjects with a written statement regarding the research.   |   |
| 12. | <p>STORAGE AND DISPOSAL OF DATA AND OTHER RESEARCH MATERIALS:</p> <p>A. How and where will the data and other research material be stored until no longer needed? <b>The consent and assent forms and the survey responses will be stored in a locked cabinet in the advisors office. The consent and the assent forms will stay away from the data which will have no identifying factors on them.</b></p> <p>B. When will the disposal of data and research materials take place? <b>no earlier than December 2019.</b></p> <p><i>At a minimum, investigators must maintain research records for at least three (3) years after completion of the research. All records must be accessible for inspection and copying by authorized representatives of the IRB, any federal department or agency supporting the research, and sponsor, if any. (Source: 45CFR46.115) If the Principal Investigator is a student, then the faculty advisor will be responsible for the record retention. If you are a member of a professional association or society, you may be required by their practices to keep records longer than 3 years.</i></p> <p>C. How will data and research materials be disposed ? <b>At the completion of the three year time period, all data will be shredded.</b></p> |   |
| 13. | <p>INDICATE ON THE CHECK LIST BELOW, ANY DOCUMENTS THAT APPLY TO YOUR RESEARCH AND ATTACH TO THIS PROTOCOL A COPY OF THE APPLICABLE DOCUMENT.</p> <p><input checked="" type="checkbox"/> SURVEY INSTRUMENT AND/OR INTERVIEW QUESTIONNAIRE</p> <p><input checked="" type="checkbox"/> INFORMED CONSENT AGREEMENT</p> <p><input checked="" type="checkbox"/> PARENTAL OR GUARDIAN PERMISSION FOR A MINOR CHILD TO PARTICIPATE IN A RESEARCH STUDY</p> <p><input checked="" type="checkbox"/> ASSENT TO PARTICIPATE IN A RESEARCH STUDY (AGES 7-14 YEARS)</p> <p><input type="checkbox"/> ASSENT TO PARTICIPATE IN A RESEARCH STUDY (AGES 15 - 17 YEARS)</p> <p><input type="checkbox"/> COPIES OF ANY OTHER MAIL TO BE DELIVERED TO RESPONDENTS OR SUBJECTS (E.G. COVER LETTERS, SCRIPTS OF VERBAL INSTRUCTIONS, ETC.)</p>  |   |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   | DO YOU CONSIDER THIS RESEARCH EXEMPT FROM REVIEW BY THE HUMAN SUBJECTS COMMITTEE? IF YES, Please check the reason for exemption from the list below:  |
| a.  | <input checked="" type="checkbox"/>   | Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (a) research on regular and special education instructional strategies; or (b) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods [45CFR46(b)(1)]   |
| b.  | <input type="checkbox"/>  | <p>Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement) survey procedures, interview procedures or observation of public behavior, unless (a) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (b) any disclosure of the human subjects' responses outside the research could reasonably place the subject at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability or reputation. [45CFR46(b)(2)]</p> <p>Research involving children (subjects that have not attained the age of 18 years) is not exempt under this category unless the research involves only the observation of public behavior and the researchers do not participate or impact the activities being observed. [45CFR46.401(b)]</p> |
| c.  | <input type="checkbox"/>  | Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior if (a) the human subjects are elected or appointed public officials or candidates for public office; or (b) federal statute(s) without exemption that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter. [45CFR46(b)(3)]   |
| d.  | <input type="checkbox"/>  | Research involving the collection study of existing data, documents, records, pathological specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. [45CFR46(b)(4)]  |
| e.  | <input type="checkbox"/>  | Research and demonstration projects which are conducted by or subject to the approval of a <b>Federal</b> department or agency heads, and which are designed to study, evaluate, or otherwise examine; (a) public benefit or service programs   |

|    |                          |   |
|----|--------------------------|---|
|    |                          | changes in methods or alternatives to those Federal programs or procedures; or (d) possible changes in methods or levels of payment for benefits or services under those Federal programs. [45CFR46(b)(5)]  |
| f. | <input type="checkbox"/> | Taste and food quality evaluation and consumer acceptance studies, (a) if wholesome foods without additives are consumed; or (b) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.<br>[45CFR46(b)(6)] |

### Certifications

By my signature below, I certify that each of the named co-researchers has accepted his/her role in this study. I agree to not begin any research activity on this study until written approval by the IRB has been received. I agree to a continuing exchange of information with the Institutional Review Board (IRB). I agree to obtain IRB approval before making any changes or additions to the project. I will provide progress reports at least annually, or as requested. I agree to report promptly to the IRB all unanticipated problems or serious adverse events involving risk to human subjects. A copy of the informed consent will be given to each subject and the signed original will be retained in my files, unless a waiver of a signed informed consent has been granted.

I further certify that I have successfully completed the following Human Subjects Training Course:

- CITI – Biomedical Research Investigator
- CITI – Social and Behavioral Research Investigator
- CITI – Undergraduate Researcher
- CITI – IRB Member

\_\_\_\_\_  
*Signature of Researcher*

\_\_\_\_\_  
*Date*

By my signature below, I certify that I have reviewed this research study and agree to counsel the student researcher in all aspects of the research study.

I further certify that I have successfully completed the following Human Subjects Training Course:

- CITI – Biomedical Research Investigator
- CITI – Social and Behavioral Research Investigator
- CITI – IRB Member

\_\_\_\_\_  
*If Student Researcher, Signature of Faculty Advisor*

\_\_\_\_\_  
*Date*

### Approval by Department Chair of Researcher of Record

*(Dean, if Chair is the Researcher or if Chair is otherwise unable to review.)*

I have reviewed this research study. I believe the research is sound, that the study design and methods are adequate to achieve the study goals, and that there are appropriate resources (financial and otherwise) available to the researcher. I support the study, and hereby submit it for further review by the IRB.

\_\_\_\_\_  
*Signature of Department Head or Dean*

\_\_\_\_\_  
*Date*

**Note: Do not use personal home addresses and phone numbers on Informed Consent, Assent, Parental Permission or Debriefing statements.**

## Appendix B

### Parent or Guardian Permission Form

IRB 02/07/2007

Winthrop University

#### Parental or Guardian Permission for a Minor Child to Participate in a Research Study

Researcher: **Casey Reeves**     Graduate Student     Undergraduate Student

Faculty Advisor: **Kathy Davis** Faculty Advisor's Position: **Associate Professor**

Title of Study: **Gender Differences Relating to Physical Activity in Middle School Students**

Your child is invited to take part in a research study. Before you decide to allow your child to be a part of this study, you need to understand the risks and benefits. This permission form provides information about the research study. I will be available to answer your questions and provide further explanations. If your child takes part in this research study, you will be asked to sign this permission form. Your decision to allow your child to take part in this study is voluntary. You are free to choose whether or not your child will take part in the study. If you should decide to allow your child to participate, you may withdraw your child from the study at any time.

#### Purpose of Research Study:

The importance of this study is to determine if there is a gap in participation in physical activity between middle school age males and females.

#### Procedures or Methods to be Used in the Study:

This study consists of a one time survey that will be administered during your child's Physical Education class. This survey asks questions related to your child's recent level of physical activity. There are no identifying questions on the survey.

#### Possible Risks/Benefits Associated with Participating in Study:

There are no foreseeable risks associated in your child being a part of this study. The benefit for your child to participate in the study is to be made aware of his/her current levels of physical activity.

#### Possible Costs/Compensation Associated with Participating in Study:

There are no costs or compensation associated with participating in this study.

#### Right to Withdraw From the Study:

You or your child have the right to withdraw the participant from the study at any point. There will be no penalty for withdrawing from the study.

#### Privacy of Records or Other Data Collected in the Study:

There are no identifying questions on the survey. There is no way for me or the researchers to know what your child answers, or which survey is his/hers.

#### Questions – Contact Information:

If you have any questions about this study, you may contact me using my Winthrop University email address: [reevesc2@winthrop.edu](mailto:reevesc2@winthrop.edu).

IRB 02/07/2007

Or through my faculty advisor at the following address:

Address: Winthrop University, 216-A West Center, Rock Hill, SC 29733  
 Work Phone: \*\*\*\_\*\*\*\_\*\*\*\* Email: [davisk@winthrop.edu](mailto:davisk@winthrop.edu)

You may also contact:

Deborah Broome 803-323-2398 [broomed@winthrop.edu](mailto:broomed@winthrop.edu)  
 Sponsored Programs and Research  
 Winthrop University  
 Rock Hill, SC 29733

**Signatures:**

By signing this consent agreement, you agree that you have read this informed consent agreement, you understand what is involved, and you agree to allow your child to take part in this study. You will receive a copy of this consent form.

\_\_\_\_\_  
 Name of Child

\_\_\_\_\_  
 Birth date of Child

\_\_\_\_\_  
 Signature of Parent or Legal Guardian

\_\_\_\_\_  
 Relationship to Child

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Signature of Researcher

\_\_\_\_\_  
 Date



## Appendix C

### Child Assent Form

IRB 10/11/06

**Winthrop University**  
**Assent to Participate in a Research Study**  
**Ages: 7 – 14 years**

I am the Researcher and my name is **Casey Reeves**. I am a student at Winthrop University.

My instructor's name is **Kathy Davis**.

Title of Study: **Gender Differences Relating to Physical Activity in Middle School Students**

I am doing a research study and your parent or guardian has given permission for you to be in this study. You do not have to be in this study if you do not want to.

You may stop being in the study at any time. If you decide to stop, no one will be angry or upset with you.

Sometimes good things happen to people who take part in research studies, and sometimes things we may not like happen.

Here are answers to some questions you might have about being in this study. If you have any more questions, you can email me. My Email: **reevesc2@winthrop.edu**

Or, you may contact my instructor at the following address:

Address: **Winthrop University, 216-A West Center, Rock Hill, SC 29733**

Phone number: **\*\*\*.\*\*\*.\*\*\*\*** Email: **davisk@winthrop.edu**

You can also call the person that works with Winthrop University research studies. Her name is Deborah Broome, and her phone number is 803-323-2398, or you can email her at **broomed@winthrop.edu**.

**Why am I doing this study?**

**I am conducting this study as a part of my Masters Degree at Winthrop University. I want to learn more about motivation and physical activity.**

**Why do I want you to be a part of this study?**

**I want you to be a part of the study because I have a degree in physical education and I am interested in learning more about the physical activity levels of students (particularly middle school students).**

**What will happen in the study?**

**This study is very simple. All I need you to do is answer the questions on a survey honestly. I will use your answers to complete my research and study.**

**Who will be told the things we learn by doing this study?**

**I will use this study in what is called a thesis. A thesis is a research paper that I am writing for my degree. You will not be identified in the research or thesis. I will not use your name or any other identifying factor.**

IRB 10/11/06

**What are the good things that might happen during this study?**

During the study, you may learn some things about physical activity and become more aware of how physically active you are.

**What are the bad things that might happen during this study?**

There should not be any bad things that will happen during the study.

**What happens if you or your parents or guardian don't want you to be in this study?**

If you or your parents don't want you to be a part of the study, you do not have to sign this paper or complete the survey.

**Will you get any gifts for being in this study?**

You will not get any gifts for being in the study, but you will get to help me out a lot and I would really appreciate it!

**Signatures:**

If you sign your name below, it means that you agree to take part in this research study.

\_\_\_\_\_  
Sign your name here if you want to be in the study

\_\_\_\_\_  
Write how old you are on this line.

\_\_\_\_\_  
Print your name on this line

\_\_\_\_\_  
Write today's date here.

\_\_\_\_\_  
Signature of person obtaining assent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name of person obtaining assent

## Appendix D

### PAQ-C

#### *Physical Activity Questionnaire*

Age: \_\_\_\_\_ Gender: M \_\_\_\_\_ F \_\_\_\_\_

Grade: \_\_\_\_\_

We are trying to find out about your level of physical activity from *the last 7 days* (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

#### **Remember:**

1. There are no right and wrong answers — this is not a test.
2. Please answer all the questions as honestly and accurately as you can — this is very important.

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

|                            | No                       | 1-2                      | 3-4                      | 5-6                      | 7 times or more          |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Skipping .....             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rowing/canoeing .....      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| In-line skating .....      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tag .....                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Walking for exercise ..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Bicycling .....            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Jogging or running .....   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Aerobics .....             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Swimming .....             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Baseball, softball .....   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Dance .....                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Football .....             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Badminton .....            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Skateboarding .....        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Soccer .....               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Street hockey .....        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Volleyball .....           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Floor hockey .....         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Basketball .....           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ice skating .....          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cross-country skiing ..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ice hockey/ringette .....  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other:                     |                          |                          |                          |                          |                          |
| _____ .....                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ .....                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

*Physical Activity Questionnaire*

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

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

3. In the last 7 days, what did you do most of the time *at recess*? (Check one only.)

- Sat down (talking, reading, doing schoolwork) .....   
 Stood around or walked around .....   
 Ran or played quite a bit .....   
 Ran and played hard most of the time .....   
 I do not have recess .....

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

- Sat down (talking, reading, doing schoolwork) .....   
 Stood around or walked around .....   
 Ran or played a little bit .....   
 Ran around and played quite a bit .....   
 Ran and played hard most of the time .....   
 I am not allowed to do anything besides eat at lunch .....

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

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

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

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

*Physical Activity Questionnaire*

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

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

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

- ..... A. All or most of my free time was spend doing things that involve little physical effort
- ..... B. I sometimes (1-2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics)
- ..... C. I often (3-4 times last week) did physical things in my free time
- ..... D. I quite often (5-6 times last week) did physical things in my free time
- ..... E. I very often (7 or more times last week) did physical things in my free time

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

|                | None                     | Little<br>bit            | Medium                   | Often                    | Very<br>often            |
|----------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Monday.....    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tuesday.....   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Wednesday..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Thursday.....  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Friday.....    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Saturday.....  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Sunday.....    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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

- Yes.....   
 No.....

If Yes, what prevented you? \_\_\_\_\_

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## Tables

Table 1

*Mean Physical Activity by Gender and Grade Across Different Activities*

| Physical Activity  | Females<br>( <i>N</i> = 48) | Males<br>( <i>N</i> = 44) | 6 <sup>th</sup> Grade<br>( <i>N</i> = 30) | 7 <sup>th</sup> Grade<br>( <i>N</i> = 32) | 8 <sup>th</sup> Grade<br>( <i>N</i> = 30) |
|--------------------|-----------------------------|---------------------------|---|---|---|
| Physical Education | 3.48 (1.13)                 | 2.93 (1.22)               | 3.00 (1.43)                               | 3.44 (0.84)                               | 3.13 (1.27)                               |
| After School       | 2.79 (1.19)                 | 2.08 (1.49)               | 2.87 (1.19)                               | 2.37 (1.24)                               | 2.03 (1.65)                               |
| Evening            | 2.36 (1.16)                 | 1.87 (1.16)               | 2.47 (1.14)                               | 1.69 (0.86)                               | 2.20 (1.39)                               |
| Weekends           | 2.61 (1.17)                 | 1.77 (1.22)               | 2.80 (0.92)                               | 2.00 (1.27)                               | 1.73 (1.33)                               |
| Overall            | 25.62 (8.75)                | 24.38<br>(10.72)          | 24.92 (7.49)                              | 26.17 (9.67)                              | 23.75<br>(11.90)                          |

Table 2

*One-Way ANOVA for Physical Activity by Gender and Grade Level*

|                    | Mean Square | <i>F</i> | <i>p</i> |
|--------------------|-------------|----------|----------|
| Physical Education |             |          |          |
| Gender             | 6.688       | 4.785    | 0.031*   |
| Grade Level        | 0.267       | 0.182    | 0.671    |
| After School       |             |          |          |
| Gender             | 11.642      | 6.280    | 0.014**  |
| Grade Level        | 10.417      | 5.579    | 0.020*   |
| Evening            |             |          |          |
| Gender             | 5.481       | 4.062    | 0.047*   |
| Grade Level        | 1.067       | 0.763    | 0.385    |
| Weekend            |             |          |          |
| Gender             | 16.306      | 11.38    | 0.001*** |
| Grade Level        | 17.067      | 11.99    | 0.001*** |
| Overall            |             |          |          |
| Gender             | 35.870      | 0.371    | 0.544    |
| Grade Level        | 46.100      | 0.478    | 0.220    |

*Note.* \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$