

LiiNK: The Role Gender Plays in Recess Activity Levels Through- out the School Day

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INTRODUCTION

Recess is the right of every child, yet every year in schools, recess time is being reduced or eliminated altogether (NAECS, 2001). This trend of decreasing recess began in the 1980s and was enhanced even more in 2001 when the No Child Left Behind Act was passed (Jarrett/Waite-Stupiansky, 2009). The emphasis in American schools shifted from producing educated and well-rounded children to only focusing on standardized test scores. Although many reasons contributed to the reduction, the two most cited reasons were academic outcomes and safety (Jarrett/Waite-Stupiansky, 2009). School personnel feared student's academic outcomes would not warrant federal and state funding, and the playground was becoming a greater liability for injuries and lawsuits. Students spend more time in the classroom than anywhere else, and "recess has traditionally served as the one outlet during the school day when kids get to recharge their bodies and minds." (State of Play, 2010) Recess is an important aspect of the school day because it allows for development outside of the typical structured curriculum. Recess gives children the chance to develop socially, physically, emotionally, and cognitively, and "learning occurs in ways not possible inside the regular classroom." (NAECS/SDE, 2001) When children are deprived of breaks, they cannot concentrate effectively and are more likely to be disruptive inside the classroom (Rhea, 2016).

Along with improved attention and concentration in the classroom, recess also plays an important part in helping combat the trend of children living sedentary lifestyles. Breaks are essential for children to be able to reset their minds and focus more effectively, but one of the largest impacts that recess can have on children is helping to combat children's increasing sedentary behavioral trends. A sedentary lifestyle can impact the child's health and can also pre-dispose children to a lifetime of physical and psychosocial health related problems (Biddle/Asare, 2011). Shockingly, surveys have found that in the United States, "40% of young children have significant cardiac risk factors including obesity, high blood pressure, high cholesterol, and an inactive lifestyle" and "one in five children are overweight" (NAECS/SDE, 2001). Other studies have found "consistent negative associations between mental health and sedentary behavior" (Biddle/Asare, 2011). These serious health issues have increased in recent years, and "with the development of technology, increasing time engaged in sedentary behavior has been noted in children" (Zheng et al, 2016). Physical activity is an important tool that can be used to help combat and reverse these health problems as well as psychosocial problems in children. Since children spend over 7 hours a day at school (Mahar, 2011), recess is the perfect platform to devote more time to physical activity. Regularly implemented recess can add valuable active time to a child's day, improve their overall health by helping to equalize their energy intake versus expenditure, and give them an outlet for any built-up stress or anxiety.

Even though health trends in childhood are generalized to the whole population of children, boys and girls develop very differently throughout childhood. One of the key gender differences over the past 20 years is physical activity levels. Boys have typically been more active than females when measured using accelerometer data (Mays-Woods et al, 2012). Among these studies, some researchers found that boys engaged in more sporting behaviors and games where girls focused more on traditional playground games (Ridgers, 2012).

Differences in types of activities children engaged in during recess are very dependent on the type of play environment supported by the school. One difficulty in the United States is that there is "no consistency in the way recess is implemented" (Ridgers, 2011). Recess varies based on the type of school, the city, and the state that the school is found. Recess is not valued in the education system in the United States and is being reduced, eliminated, or substituted for more structured activity times like Physical Education (NAECS/SDE, 2001). When children are afforded recess times, "children accumulate more time spent in physical activity during unstructured play environments" lending support to the idea of unstructured play (Mota et al, 2005). Unstructured play is an "outdoor break where the experience is whatever the child wants it to be" and "affords children opportunities to explore on their own terms" (Rhea, 2016). Even though unstructured play has been shown to be effective, many feel that "recess should be more structured, with specific instructions oriented toward physical activity" to make sure children are reaching their daily activity needs (Rhea, 2016). The disparity between unstructured and structured recess is huge, and when the schools have the power to implement whatever type of recess they decide, it could lead to significant differences in activity levels and intensity amongst children (Mays-Woods et al., 2012).

So why is there such disparity between recesses? One reason could be that every child and, further, every school has different patterns of play. When children are not regularly afforded unstructured time to play in a school setting, many will struggle academically, as well as socially and emotionally, i.e., finding their identity, being creative, problem solving, and learning how to socialize with their peers (Jarrett/Waite-Stupiansky, 2009). Through unstructured time, boys and girls may have similar activity levels since activity can occur through various modes of play. One

of the difficulties in measuring activity levels of children in schools is the limited amount of unstructured, outdoor play that exists today. Over the years, recess has been used as this type of break. More recently, however, this break has been slowly removed to allow more classroom time for academic preparation.

One research group has developed a way to incorporate multiple recesses throughout the school day that are considered free play with no adult guidance. Let's Inspire Innovation 'N Kids (LiiNK) project is the umbrella organization whose philosophy and research helped inspire and build this study. The LiiNK project was created about four years ago to target and create change in American schools by combatting the problems with recess. The LiiNK project wants to help children "create a balance between academics" and their "social/emotional health" (Rhea, 2016). There are three main goals of the LiiNK Project: 1) provide three full day trainings in the spring before launching the intervention, 2) implement four 15-minute unstructured, outdoor play breaks into the school day, and 3) introduce a character development curriculum four times a week for 15 minutes each. The character development curriculum is called Positive Action (2008) and it includes seven different content areas including "1) School connectedness, 2) Prosocial, 3) Respect for adults, 4) Honesty, 5) Children's empathy, 6) Bullying, and 7) Engagement and disaffection with learning" (Rhea, 2016). The school day's schedule is altered to fit the schedule of four daily 15-minute recesses and four 15-minute character development lessons taught weekly. The emphasis on regularly scheduled recess is an important aspect to the LiiNK project. These regularly scheduled breaks give children time "to allow for increased oxygen and glucose to fuel the brain" which can lead to better cognitive development and attentive behaviors inside the classroom (Rhea, 2016). So far, the results at LiiNK intervention schools have been substantial. There is a noticeable increase in "attentional focus, an increase in listening skills and an increase in the desire to stay on task to completion across all students" (Rhea, 2016). Along with the changes in the classroom, parents have noticed, "their children came home much happier and less anxious" (Rhea, 2016). Additionally, "bullying is declining with LiiNK children, and prosocial behaviors are replacing the bullying behaviors of other children" (Rhea, 2016). Recess has been shown as a vital time for child development. Researchers have shown that children need the time for free play to enhance their creativity as well as be active in their environment. LiiNK results are showing positive changes in children that lead to better academic outcomes. There are still many questions about unstructured free time, character elements in the curriculum, and academic outcomes that further LiiNK research is exploring.

PURPOSE OF THE STUDY

The purpose of this research study was to focus on the physical activity differences during recess of grade 1 children. This study compared activity levels of grade 1 males and females during each of four unstructured recess times scheduled at 15 minutes each and determined the activity patterns of children during each of these recess time periods.

ENVIRONMENTAL HEALTH OVERVIEW

Are there activity level differences between males and females in a LiiNK intervention school across the four recess times daily?

Hypothesis 1: The boys will overall be more active regardless of recess period.

Hypothesis 2: All four recesses will exhibit similar number of steps for each gender.

METHOD

Participants

The participants for this study were from a LiiNK intervention North Texas public elementary school. The LiiNK students engaged in four 15-minute recess periods every day and four 15-minute character development classes every week. The focus of this type of schedule with the LiiNK intervention is to improve children's classroom attentiveness and cognitive development along with giving them breaks to develop physically, socially, emotionally, and creatively. There was N= 22 males and N= 23 females from the intervention school in the 1st grade.

Measures

Two measures were used in this study: a demographic questionnaire and accelerometers.

Demographic questionnaire. A demographic questionnaire was administered to the teachers at the intervention school to collect data on grade level and gender.

Accelerometers. We used the ACTI GRAPH GT3XP-VT accelerometers (Kelly et al, 2013). These accelerometers are used around the world by researchers "to capture and record continuous, high resolution physical activity and sleep/wake information" (actigraph.com). The accelerometers are worn on the non-dominant hand of the participant and measure movement on three axes. These three axes are verified by Acti-graph and measure movement vertically, horizontally, and perpendicularly to accurately capture all essence of movement and intensity. The accelerometers measure the intensity (sedentary, light, moderate, and vigorous), time (time of day), frequency (how often in a given period were the children active), and duration (how long the children were active for) of the activity of the children. All of these values can be downloaded and then analyzed using computer software.

Procedures

The LiiNK Project was approved by the Institutional Review Board at Texas Christian University. The Department of Kinesiology Review Committee also approved the study. We received informed consents from all the parents/guardians of the children before we began our data collection. Our study is a descriptive cross-sectional study. Schools and parents were notified in Fall of 2016 of the additions to The LiiNK Project that were implemented during the Spring of 2017. Letters with information about the current study and informed consent for children to participate was sent to parents/legal guardians. Students were not allowed to participate if informed consent was not obtained from parents, teachers, and administrators. A meeting with teachers and parents of participants was held approximately a week before data collection to review the procedures, accelerometers, and participation required.

Accelerometers. The grade 1 children in the intervention school were each distributed an accelerometer at the beginning of the week on Monday at eight in the morning and wore it continually day and night for five days and four nights for two weeks. Ten days of data were collected for the first grade level. As previously mentioned, the accelerometers used were the ACTI GRAPH GT3XP-VT accelerometers. Participants were told to place the device on their non-dominant wrist on the first day of the study. Any problem that the teacher noticed was told to a researcher at the end of the school day so the device could be fixed or replaced. At the end of each school day, teachers recorded if any student left early, arrived late, went to the nurse, or was absent and relayed this information to the researcher so notes could be made and adjustments to the data can be made. Class schedules were collected to note any abnormal activities that occurred during the school day that would interfere with recess or cause an abnormal change in physical activity. Data from the accelerometers were saved on the device every day and collected by a computer. At the end of the first week, we downloaded all the data from the accelerometers and collected the accelerometers for the weekend. We repeated this procedure for the second week of testing.

We monitored the weather daily to make sure that there was a consistent temperature throughout the 10-day study and that the children were able to be outside for each recess. We used accelerometers that measured the steps taken by the individual, the intensity level (moderate to vigorous), and at what point throughout the day 15-minute recesses took place. We can pinpoint where the four recesses take place and collect the steps taken

by the individual, the intensity level (moderate to vigorous), and at what point throughout the day 15-minute recesses took place. We can pinpoint where the four recesses take place and collect the steps taken during those periods. We averaged the data that we collected based on gender within the first grade.

RESULTS

Table 1 shows the means and standard deviations for total recess steps by day. No significant differences were found for any of the days, $F(3,9) = .346, p = .79$. Table 2 shows the means and standard deviations for Gender by each Recess. No significant differences were found for step count by gender by each of the four recesses $F(4,44) = 1.20, p = .33$.

Table 1. Total Recess Step Count by Day

Day of the Week*	Mean	Standard Deviation
1	35304.67	24508.11
2	31411.00	23438.06
3	48222.00	18288.61
4	46561.50	19373.36

*1:Monday 2: Tuesday 3: Wednesday 4: Thursday

Table 2. Total Step counts for Gender by each Recess

	Gender*	Mean	Standard Deviation
Recess 1	0	2229.23	502.63
	1	2211.09	395.22
Recess 2	0	2312.68	304.69
	1	2119.00	298.11
Recess 3	0	1969.32	270.08
	1	1909.30	262.41
Recess 4	0	2160.27	306.06
	1	2005.57	327.36

*0:Male 1:Female

DISCUSSION

The purpose of this research study was to look at the physical activity differences of grade 1 males and females during each of four unstructured recess times scheduled for 15 minutes each and determine the activity patterns of children throughout a school day. The results showed no significant differences for either category of data measured: total recess step counts by day and total step counts for gender by each recess. The lack of significance in our study gives support for unstructured play over structured play in the recess setting.

Unstructured play is a key aspect of the LiiNK project. In LiiNK project schools, it is emphasized that all recess times are to be unstructured with no balls allowed and minimal to no adult intervention into the playtime. Without balls available to enable sporting behaviors, the children must be creative in coming up with their own games as well as working with others to create their games. These are fundamental skills that children must work on and develop, and LiiNK project recess times give the perfect setting to learn and adapt these skills. In these unstructured settings, children did not struggle with finding things to do and still maintained high levels of activity during recess. Both genders exhibited similar numbers of steps in each recess period showing that there are no gender differences in an unstructured play setting. This warrants support for the effectiveness of the LiiNK project in that both genders are getting high levels and equal levels of steps.

In the study, we also looked at the trends of the data across the day for steps and across the week. No significant differences across the four recess periods and no visible differences in means revealed that the children need and continually benefit from these recess periods and are not tiring across the day. When comparing the mean steps for both genders across the days of the week (Monday-Thursday), we found no significant differences, showing that the children can handle consistent levels of high activity and do not fatigue by the end of the week. These findings can challenge claims that the children fatigue across the day or week and therefore their academic achievement decreases because of their fatigue. Children need to be active for their physical and mental well-being. Thus, increasing the amount of unstructured play has been shown to produce more active children overall, both male and female, which can then lead to less sedentary and healthier children. In summary, the study shows that when given an unstructured play environment, children will create their own type of physical activity and will not be restricted by societal gender activity stereotypes.

FUTURE CONSIDERATIONS

Based on the findings in this study, future research is still needed on gender differences during recess times. One key aspect to future research will be the differences in genders in schools that have unstructured recess versus a more structured recess time and what activities do the children partake in at each school. For the LiiNK project specifically, it will be important to look at the differences between the intervention school results that were found in this study versus the recordings taken in a control school. In addition, more widespread integration of the LiiNK project into schools will help positively change the education system and give children the much-needed free time to play and develop as children.

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