RUNNING HEAD: Physical Activity

PHYSICAL ACTIVITY AND STUDENTS BEHAVIOR IN THE ELEMENTARY SCHOOL CLASSROOM

By

Chelsea Gundersen

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Professional Education Faculty

Northwest Missouri State University

Department of Professional Education

College of Education and Human Services

Maryville, MO 64468

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ABSTRACT

This study was completed to find if there was a significant difference in behavior within the classroom on days with indoor recess, outdoor recess, and physical education. The amount of recess per day and per week should be considered when planning the class and school schedule. Students should engage in recess to have a break from academic learning. Recess allows time for the information learned to set in and allows the students to get out any energy that has built up during the course of the day. With longer learning periods between physical activities, brain breaks are often a way to give a short break to students during a long lesson. After compiling and reviewing the findings of this study and current research and literature, it is found that there was a significant relationship between the number of recesses a day and the behavior of students on days with only outdoor recess and on days with outdoor recess and physical education. This means that as the number of recesses a day increases the behavior episodes on days with outdoor recess and outdoor recess with physical education class decrease.

INTRODUCTION

Background, Issues and Concerns

There was interest in the behavior of students on days when there is little to no physical activity. On days with little to no physical activity teachers and staff feel that students are less attentive within the classroom. In order to continue teaching and keeping the students engaged teachers needed to keep them active and interested on all days. Little research has been done on the topic of physical activity affecting the behavior of students inside the classroom.

Practice under Investigation

The practice under investigation looked at the behavior of students within the elementary classroom. There was an investigation to see if there was a significant difference in the students' on task behaviors on days with more physical activities than those with little to no physical activity. This looked at survey results from teachers in three elementary schools within one school district. Results from the survey were compared from each of the different schools.

School Policy to be Informed by Study

Every school has a certain amount of time allowed for physical activity outside of the classroom. If there is a significant difference in on task behavior of children inside the classroom based on physical activity outside the room schools should make sure they allow ample time for physical activity based on the time amounts from the survey.

Conceptual Underpinning

Students need to move and be active much like we do. When they sit for a period of time they get antsy and talkative, which may disrupt class. Ideally physical education,

recess, brain break, or energizers would be great to have about every hour or so. When instructional periods are kept short and followed by breaks, children's attention to task is maximized (Stevenson & Lee, 1990). Brain breaks are short breaks of activity that allow the students to move and be active. It helps them refocus and get their minds off of the academic load for a short time. Brain breaks can be doing exercises, dancing to a movie clip, moving around the room etc. Brain breaks help the students refocus on what they are learning, allows them to get up and move, allows them to communicate with others in the class, and get in some physical activity. This allows for more learning to be done and less disruptions in class between recess, lunch, and physical education.

Statement of the Problem

If there is a difference in classroom behavior, schools need to know in order to better provide physical activities in the curriculum to allow for better behavior in the classroom.

Purpose of the Study

The purpose of the study was to see if the amount of physical activity outside of the classroom had an impact on the behavior of elementary students inside the classroom.

Research Question(s)

RQ#1: Is there a relationship between out of class physical activity and student behavior in the elementary classroom?

Null Hypothesis(es)

There is no relationship between out of class physical activity and student behavior in the elementary classroom.

Anticipated Benefits of the Study

The anticipated benefits of the study were to show the importance of physical activity within the school day and to help the students be more attentive in the classroom. This will help teachers to see if it is important to have those physical activity breaks more frequently or less frequently in order to get students to be more attentive in the classroom. This will help identify a need to take breaks during the day in between out of class physical breaks in order for the students to get a brain break to refocus.

Definition of Terms

Physical Activity: Any body movement produced by the muscles, which release a large amount of energy.

On Task Behavior: Any behavior or action that is necessary to complete the assignment or task given by the teacher.

Brain Break: Short breaks of activity that allows the students to move and be active.

Indoor Recess: A time of day where children are able to engage in free play inside they would not normally get. May include playing board games, card games, drawing on the board etc.

Outdoor Recess: A time of the day where children are able to engage in free play with others in the same grade outside.

Physical Education: A school-based program that provides students with the chance to be physically active and release energy.

Gross motor: Any activity that uses the whole body in order to do the required task.

Summary

A study was conducted to see if there was a relationship between the amount of physical activity and the behavior in the classroom. If there was a strong positive relationship the schools and districts should consider increasing the amount of physical activity the students receive during the school day. On days with less physical activity it was believed that students are more off task within the classroom. Students need to get their energy out, this allows for schools to give the opportunity and not disrupt the classroom learning. After this study was completed, school districts will benefit by looking at the data and provide changes to the school day if needed.

REVIEW OF LITERATURE

Due to the No Child Left Behind Act of 2001 and the emphasis on end of year testing children are given less free time because there has been an emphasis on end of year testing and your core subjects. Schools have also reduced time committed to recess, creative arts, and physical education. This is "inadvertently pressuring administrators and teachers to spend more sedentary time in the classroom and less physically active time in physical education and recess in an effort to improve standardized test scores" (Mahar, 2011, p. s60). A study conducted at the University of Michigan showed that since the late 1970's children had a decrease of 12/hours a week in free time with a 25% decrease in play and 50% decrease in unstructured outdoor activities. "Since the passage of the No Child Left Behind Act in 2001, 44% of school administrators report cutting significant time from PE and recess so there's more time for subjects such as read and math" (Hellmich, 2013,p.1).

"The time assigned for free play at school is known as recess" (Barros et. al., 2009, p.431). Recess is defined by Pellegrini and Smith (1993) as "a break period, typically outdoors, for children (p.51)." "The most obvious characteristic of recess is that it constitutes a break from the day's routine" (Jarrett, 2002, p.1). "Recess can play an important role in the learning, social development, and health of elementary school children" (Jarrett, 2002, p.2). There are a few theories on why students need a break to release energy. The oldest of these theories is the surplus energy theory by Herbert Spencer. "The surplus energy theory, was proposed by Herbert Spencer in 1898 and suggests that surplus energy accumulates when one is engaged in sedentary activities and

that an opportunity for physical activity is needed to 'blow off stem' or use the surplus energy" (Jarrett et. al., 1998, p.122).

"When persons are engaged in an activity long enough to become habituated, they become bored and seek novelty" (Jarrett et al., 1998, p.122). "Children's attention may be maximized by encouraging short, but frequent, physically active bouts" (Pellegrini and Smith, 1993, p.57). Recess may have impacts on behavior for individual students as well as "have a benefit for overall group classroom behavior" (Barros et. al., 2009, p.435). A study done by Pellegrini et. al., (1995) showed that children were less attentive during long periods of learning compared to short periods of learning. In a study done by Jarrett et. al., (1998) the effects of recess were highly significant, the study showed children worked more and were less fidgety when they had recess. When the students did not have recess they were only on task 85% of the time while, when they had recess they were on task 90% of the time. In the same study by Jarrett et. al. (1998) found that all five children with ADD benefited from recess as well as 12 gifted children and three students from transient housing.

"Recess could be seen as the spacing between various learning tasks" (Jarrett et. al., 1998, p.122) because "When children come back from these breaks, they seem more attentive and ready to work than before the breaks" (Pellegrini and Bohn, 2005, p.15). "It may be that making a provision for recess after specific periods of set work would increase the attention of active children" (Pellegrini and Smith, 1993, p.55). Research on both indoor and out-door recess have the same results "Children were more attentive after recess than before" (Pellegrini and Bohn, 2005, p.15).

Not only does recess have benefits in the classroom but it also provides learning experiences for students. “Unstructured peer and interaction affords opportunities to learn and develop new social and cognitive skills” (Pellegrini and Bohn, 2005, p.15). “What children do on the playground does have cognitive implications” (Pellegrini and Smith, 1993, p.59). To help students get the benefit of recess in the classroom and during recess Pellegrini and Bohn (2005) have an example of how to change the school year “extending the American school day and school year, with more frequent recess periods, might positively affect children’s cognitive performance and social competence, while simultaneously providing parents with badly needed child care for more extended periods” (p.17).

Children today have a more sedentary lifestyle than generations before causing childhood obesity to be a greater problem (Patterson, 2013, p.1). As the childhood obesity rate goes up schools are cutting physical education and recess (Patterson, 2013). Since the implementation of No Child Left Behind 44% of schools with in the United States have made significant cuts to the amount of time children spend in physical education and recess (Hellmich, 2013 and Patterson, 2013).“It is also estimated that only about half of America’s youth meet the current evidence-based guideline of the U.S. Health and Human Services Department of at least 60 minutes of vigorous or moderate intensity physical activity daily.” (Patterson, 2013, p.2). It was also mentioned that if the U.S. Education Department would make physical education a required part of all school’s main curriculum it would show a lot of people the importance of physical activity and Physical Education (Patterson, 2013). Some recommendations for PE classes are: at least 30 minutes a day in PE class, 150 minutes a week in PE for children in elementary, half

of PE time should be doing vigorous to moderate-intensity activities, and to have vigorous to moderate intensity through out the day (recess, classroom breaks, and active learning) (Hellmich, 2013). With those recommendations being stated “4% of elementary schools, 8% of middle schools, and 2% of high schools in the United States provided daily physical education” (Lee et. al., 2007, p.459). “Even a formal, structured, physical education class may not offer the same benefits as recess” (Barros et. al., 2009 p.435). However, “Children often are more attentive, behave better, and perform as well or better scholastically after participation in physical activity through recess or physical education” (Mahar et. al., 2006 p.2086). “To make full use of a PE teacher, some classes must have PE during the first period or the last period of the day. Those students receive physical activity, but not a break in the instructional day.” (Jarrett et. al., 1998, p.121).

“In the United Kingdom, schools have morning, lunch (called “dinner”), and afternoon breaks” (Pellegrini and Bohn, 2005, p.13). “The duration of the break periods decrease with age: 93 minutes for children in infant school (5 to 7 years of age), 83 minutes for junior school (7-11 years of age), and 77 minutes for secondary school students (11-16 years of age)” (Pellegrini and Bohn, 2005, p.13). “Morning and afternoon periods of about 15 minutes each and a dinner play period of about 80-90 minutes.” (Pellegrini and Smith, 1993, p.52). “Typical Japanese schools have 10-20 min recess periods between 45-min lessons or 5-min breaks between lessons, with a long play period after lunch” (Lewis, 1995, p.50 &65 and Jarrett et. al., 1998, p.121). “Evidence from Asian schools suggests that children’s attention to class work is maximized when structured time is relatively short and is followed by breaks” (Pellegrini and Bohn, 2005, p.15). “In most Asian elementary schools, students are given a 10-minute break after

every 40-50 minutes of instructional time, depending on the grade" (Barros et. al., 2009, p.435 and Pellegrini and Bohn, 2005, p.15). "In Taiwan, schools have many recess periods in the day; children also are given 5-6 min of transition after recess before they are expected to settle down to their assignments" (Pellegrini, 1995, p.11 and Jarrett et. al., 1998, p.121).

"For people of all ages and in all fields, breaks are considered essential for satisfaction and alertness" (Jarrett, 2002, p.1). Everyone must remember that children are at their desks a large part of the 6 to 7 hours a day they are at school (Patterson, 2013). In the work force breaks are demanded for adults, we need to demand breaks for our children (Patternson, 2013, p.2). "Breaks are built into the normal work day. The adult equivalent of recess, the coffee break, is an opportunity to move around and to socialize" (Jarrett et. al., 2001, p.121).

In a study conducted by the British they found in preschool there is no gender effects with playground behavior. The study suggests that the gender differences may start to appear later in the primary school years. "Children were more active after the long condition" (Pellegrini et. al. 1995, p.860). Meaning a longer time frame of academic work compared to a shorter time frame. "Children's physical activity was greater after long confinement, and boys were more active than girls" (Pellegrini et. al., 1995, p.860). "Boys are more active on the playground than are girls, and their levels of activity can be increased by previously limiting their opportunity for vigorous physical activity" (Pellegrini and Smith,1993, p.56). The longer between recess breaks the more active and vigorous play will be seen from boys on the playground. Girls tend to prefer indoor playtime because they are less likely to have boys intrude into their play space. This is

due to the boys' higher level of activity and the games they tend to play.

"Energizers are short classroom-based physical activities" (Mahar, et. al., 2006, p.2087). Energizers give K-5 students an opportunity to increase their daily physical activity in school. "Energizers are led by classroom teachers in their classroom, take approximately 10 min to perform, and integrate academic content" (Mahar, 2011, p.s63). These activities use grade appropriate learning materials, need no equipment, and require little preparation by the teacher. Before the research was done teachers were given a short 45-minute training on how to lead Energizers. They were given information about childhood obesity and Energizers activities. Teachers were also able to participate in several of the activities and given a booklet with the different Energizers included. The group that did one Energizer a day had 782 more daily in school steps then the group with no Energizers. They also continued to have recess every day as usual. "Assuming that a typical school year include about 180 school days, an additional 782 steps during each school day would result in approximately 140,760 more steps during the course of the school year" (Mahar et. al. 2006, p.2091). Which, if turned into walking steps they would walk about 70 more miles per school year. "Incorporating Energizers activities into school curricula may be beneficial to students as well as teachers" (Mahar et. al., 2006, p.2093). "Inclusion of 10 min of physical activity each day in the classroom will increase on-task behavior" (Mahar et. al, 2006, p.2092). "Improved on-task behavior is beneficial in the classroom, inclusion of 10 minutes of physical activity will, in all likelihood, improve academic performance." (Mahar et. al., 2006, p.2092). "The effect of the Energizers activities on on-task behavior was stronger for the students who needed it the most" (Mahar, 2011, p. s63).

The National Association for Sport and Physical Education (NASPE) have several recommendations on the time that students should be engaged in physical activity. One recommendation is that schools recess should be at least once daily for greater than or equal to 20minutes. They also recommend that students between the ages of 5 and 12 years old should receive greater than or equal 60 minutes of physical activity every day with inactivity periods of 2 hours or more discouraged. There are about 42% of 6 to 11 year olds and 8% of adolescents that actually meet the recommendations of 60 minutes or more a day based on a nationally representative survey.

RESEARCH METHODS

Research Design

A quantitative study was conducted to see if there is a difference in on task behavior on days where the students had little to no physical activity verses days with more physical activity. The independent variable being tested was time spent on physical activity, while the dependent variable tested was behavior of students. If a difference found was significant in behavior that teachers and schools should add more or adequate physical activity into the school day.

Study Group Description

The study group of the survey was Kindergarten through fifth grade teachers from elementary schools within a suburban Mid-western district who have physical activity (recess and physical education) incorporated into the school day. Survey's were received from three of six elementary schools within the district and sent out to four schools. All six schools were asked to send out the survey, four schools said they would, three schools sent out surveys, and responses were collected from three schools. School one had five surveys returned, school two had three returned, and school three had four returned. School one had eighteen classroom teachers, school two had ten classroom teachers, and school three had ten classroom teachers. School one had 418 students, school two had 224 students, and school three had 181 students in grades Kindergarten through Fifth Grade.

Data Collection and Instrumentation

Surveys were sent out and collected via email from teachers within a suburban Midwestern district teaching Kindergarten through Fifth grade. Once received they were printed and filed for data analysis.

Statistical Analysis Methods

A correlation analysis was done to find if there was a relationship between the amount of times students have physical activity and recess and their behavior within the classroom. This study tested the null hypothesis: There is no relationship between out of class physical activity and student behavior in the elementary classroom.

FINDINGS

A Pearson Correlation was conducted to decipher whether there was a relationship between the amount of times students receive out of class physical activity and behavior inside the classroom. The following tables will depict the organized findings based on the data collected from surveys that were received from teachers. The survey pertained questions about the number of times students had recess and physical education as well as their behavior on those days with indoor and outdoor recess as well as with physical education.

Figure 1

Correlation study for number of recesses per day and behavior in the classroom with indoor recess

	N	Mean	r	R^2	p-value
Number of recesses a day	12	3.67%			
Behavior with indoor recess	12	2.42%	-.31	9.6%	.33

Note significance = or < .25

There is a chance relationship between number of recesses per day and the behavior on indoor recess days because -0.31 is further from one. A negative relationship exists between the number of recesses per day and behavior on indoor recess days (r= -.31). There is not a practical relationship between recesses per day and behavior on indoor recess days because R^2 is 9.6%, which is less then 10%. The mean for number of recesses a day is 3.67%. The mean for behavior with indoor recess is 2.42%. There is not a significant relation between number of recess per day and behavior on indoor recess days because p-value is .33, which is greater than the alpha level of .25. The null hypothesis states that there is no relationship between out of class physical activity and student

behavior in the elementary classroom. The null hypothesis is not rejected because the p-value, .33, is greater than the alpha level, .25. This shows that the number of recesses with in door recess does not significantly impact student behavior.

Figure 2

Correlation study for number of recesses per day and behavior in the classroom with outdoor recess

	N	Mean	r	R^2	p-value
Number of recesses a day	12	3.67%			
Behavior with outdoor recess	12	3.17%	-.43	18.49%	.17

Note significance = or < .25

There is a fair relationship between number of recesses per day and the behavior on outdoor recess days because -0.43 is halfway to one. A negative relationship exists between number of recesses per day and behavior on outdoor recess days (r= -.43). There is a practical relationship between recesses per day and behavior on outdoor recess days because R^2 is 18.49%, which is greater then 10%. The mean for number of recesses a day is 3.67%. The mean for behavior with outdoor recess is 3.17%. There is a significant relation between the number of recesses per day and behavior on outdoor recess days because the p-value, .17, is less than the alpha level, .25. The null hypothesis states there is no relationship between out of class physical activity and student behavior in the elementary classroom. The null hypothesis is rejected because the p-value (.17) is lower than the alpha level (.25). This shows that the number of recesses with outdoor recess does significantly impact the students' behavior. As the number of outdoor recesses increases, the number of behavior episodes decreases.

Figure 3

Correlation study for number of Physical Education classes a week and behavior on days with Physical Education

	N	Mean	r	R^2	p-value
Number of PE classes a week	12	4.33%			
Behavior on days with PE	12	3.3%	-.21	4.41%	.57

Note significance = or < .25

There is a chance relationship between the number of Physical Education (PE) classes a week and the behavior on days with Physical Education (PE) because -0.21 is further from one. A negative relationship exists between number of PE classes a week and behavior on days with PE (r= -.21). There is not a practical relationship between the number of PE classes a week and the behavior on days with PE because R^2 is 4.41%, which is less then 10%. The mean of the number of PE classes a week is 4.33%. The mean for the behavior on days with PE is 3.3%. There is not a significant relation between the number of PE classes a week and behavior on days with PE because the p-value is .57, which is greater than the alpha level of .25. The null hypothesis states that there is no relationship between out of class physical activity and student behavior in the elementary classroom. The null hypothesis is not rejected because the p-value (.57) is greater than the alpha level (.25). This shows that the number of PE classes a week does not significantly impact the behavior on those days with PE.

Figure 4

Correlation study for number of Physical Education classes a week and behavior on days with Physical Education and Outdoor recess

	N	Mean	r	R^2	p-value
Number of PE classes a week	12	4.33%			
Behavior on days with PE and outdoor recess	12	3.1%	-.06	.36%	.87

Note significance = or < .25

There is a chance relationship between the number of Physical Education (PE) classes a week and the behavior on days with Physical Education (PE) and outdoor recess because -0.06 is further from one. A negative relationship exists between the number of PE classes a week and behavior on days with PE and outdoor recess (r= -.06). There is not a practical relationship between the number of PE classes a week and the behavior on days with PE and outdoor recess because R^2 is .36%, which is less then 10%. The mean for the number of PE classes a week is 4.33%. The mean for behavior on days with PE and outdoor recess is 3.1%. There is not a significant relation between the number of PE classes a week and behavior on days with PE and outdoor recess because the p-value is .87, which is greater than the alpha level of .25. The null hypothesis states that there is no relationship between out of class physical activity and student behavior in the elementary classroom. The null hypothesis is not rejected because the p-value (.87) is greater than the alpha level (.25). This shows that the number of PE classes a week does not significantly impact the students' behavior on days with PE and outdoor recess.

Figure 5

Correlation study for number of recesses a day and behavior on days with Physical Education and Outdoor recess

	N	Mean	r	R^2	p-value
Number of recesses a day	12	3.67%			
Behavior on days with PE and outdoor recess	12	3.1%	-.69	47.61%	.03

Note significance = or < .25

There is a moderate relationship between the number of recesses a day and the behavior on days with Physical Education (PE) and outdoor recess because -0.69 is closer from one. A negative relationship exists between number of recesses a day and behavior on days with PE and outdoor recess (r= -.69). There is a practical relationship between the number of recesses a day and the behavior on days with PE and outdoor recess because R^2 is 47.61%, which is greater then 10%. The mean for the number of recesses a day is 3.67%. The mean for the behavior on days with PE and outdoor recess was 3.1%. There is a significant relation between the number of recesses a day and behavior on days with PE and outdoor recess because the p-value is .03, which is less than the alpha level of .25. The null hypothesis states that there is no relationship between out of class physical activity and student behavior in the elementary classroom. The null hypothesis is rejected because the p-value (.03) is less than the alpha level (.25). This shows that the number of recesses a day does significantly impact the behavior on days when students have both outdoor recess and PE.

CONCLUSIONS AND RECOMMENDATIONS

The outcomes reported from the study show that the number of recesses a day do effect the behavior of students on days where there is outdoor recess or outdoor recess and physical education and have a significant relationship on each other. This is also confirmed by Jarret et. al., which states the effect of recess was highly significant, children worked more and were less fidgety when they had had recess (1998).

The findings show there is not a significant relationship between the number of recesses and the behavior on days with indoor recess as well as the number of physical education classes per week and the behavior on days with physical education. In an article by Pellegrini and Bohn, found that children were more attentive after both indoor and outdoor recess (2005).

The conceptual underpinning of having brain breaks in the classroom will help with behavior on days with indoor, outdoor, and or physical education days. It gives the students a chance to have a break from learning and let their brain catch up on all the information plus gives them a physical break from sitting. This will increase retention in students as well as give them extra physical activity inside the classroom since we cannot have recess or physical education every hour this is a better situation for both teachers and students.

After concluding this study there are some further studies that could be conducted. A study could be performed with more schools and teacher base within the district to see if the findings stay the same or change with a bigger data set. Another study could be done on the amount of time spent in physical activity everyday. There could also be a study done across several districts in the state or nation wide. This research could

show if the larger study base causes a change in the affect of physical education on behavior in the classroom.

Questions have also formulated about physical activity and behavior. Research shows that the number of recesses a day affect behavior more when there is outdoor recess and outdoor recess and physical education the same day. Could this depend on the activities that are being done within those time frames? What if the indoor recess activities changed become more active would that change behavior? Another beneficial study could be to see how behavior is affected based on gender or the time of the school year. This would help to give educators and staff a better understanding of physical activity students need outside of the classroom activities to have better behavior in the room.

Professional development and changes to the school day will need to cover more physical activity everyday and training for teachers to know how to incorporate physical activity into indoor recess. Further data on this topic will help to give districts a better idea on what training and changes will be needed. When teachers have the training to increase the activity level with little preparation and the proper training during indoor recess times, outdoor recess times, and physical education times they are more likely to do these then with not training or knowledge. These outcomes should be used with caution due to the small sample size used in the study.

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