


Master Capstone Project

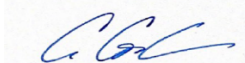
**Intentional Physical Activity Breaks and Their Effects on Students' Behavior**

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**Abstract**

Children throughout America are not getting enough physical activity in their day. The Covid-19 pandemic and the safety precautions that come with students returning to school in person have made students even more sedentary in their school day. The lack of physical activity can have many effects on student behavior. This action research study was designed to examine the effect of intentional physical activity breaks on student behavior. The participants of this study were 13 fifth grade students in a private, Catholic school. Baseline data was first gathered on student behavior without any physical activity breaks and then compared to data on student behavior after two intentional physical activity breaks were provided each day for students. The researcher's data analysis showed that giving students two intentional physical activity breaks per day increased student desired behaviors and, therefore, increased the ratio of desired to undesired behaviors in students.

### **Introduction**

Due to the Covid-19 pandemic, remote learning has been the norm for most of America for the past nine months. Thus, students are spending most of their days in front of a computer screen and are missing most of the physical benefits of school. At this time, many schools are choosing to phase back in, but are implementing many new restrictions and safety precautions (Centers for Disease Control, 2021). During the remote learning period, and even when they return to school with the new regulations, students are spending an average of 1.5-3 hours in front of a computer screen or sitting stagnant for school related activities as well as up to eight hours in front of a screen for leisure time (Dunton, Do, & Wang, 2020). Students are more attentive and better behaved when they are able play regularly at recess or Physical Education class (Mahar, Murphy, Rowe, Golden, Shields, & Raedeke, 2006). This highlights a problem in the distance learning model and new distancing safety precautions upon returning to school that most schools are implementing (Mahar, Murphy, Rowe, Golden, Shields, & Raedeke, 2006).

Physical activity breaks improve many behavioral issues that arise with students, specifically off-task behavior, as the students are better able to focus once they have been able to engage in physical activity (Harvey, Lambourne, Greene, Gibson, Lee, & Donnelly, 2017). Intentional physical activity break interventions have affected student behavior in many positive ways (Harvey, Lambourne, Greene, Gibson, Lee, & Donnelly, 2017) and was examined in this study to address the problem of undesired student behavior and lack of physical activity in schools.

**Dilemma (or Problem Statement)**

The problem addressed in this action research study was that some elementary age students were not getting enough physical activity in their school day, specifically during the time of the Covid-19 pandemic. This problem can lead to students having more behavior problems and less on-task and desired behaviors.

**Rationale**

Lack of physical activity in schools is an issue that has impacted students all over the world for many years. It is also an issue that has been exacerbated by the Covid 19 pandemic. Due to the fact that students were stuck at home for months and could not attend school in person, the already low levels of physical activity in schools were taken down even further and replaced with increased screen time and sedentary behavior (Bates et al., 2020). The Center for Disease Control (CDC) recommended that students get at least 60 minutes of physical activity per day, and many students are not reaching that threshold, pandemic or not (CDC, 2020). Although physical activity can have many benefits for students including emotional regulation, cardio metabolic health, and bone density (Bates et al., 2020), it also has a strong impact their behavior and overall learning, and makes it a crucial issue to address (Dunton, Do, & Wang, 2020).

Carlson et al. (2015) stated that for maximum behavioral benefits, students need to have physical activity breaks structured into their school day. When students are more sedentary, they are more likely to participate in undesired behaviors such as not raising their hands, spending time off task, or tapping/talking during direct instruction. Howie, Beets, & Pate (2014) found that all negative behaviors, and specifically off task behavior, decreased significantly after an in-class physical activity intervention. In addition, another study conducted by Schmidt, Benzing, &

Kramer (2016) found that students between the ages of 11 and 12, when given the opportunity for intentional classroom-based physical activity breaks, decreased their off-task behavior time and increased engagement during instruction.

In addition to decreasing undesired behavior, integrating physical activity breaks into the school day also has been proven to increase desired behaviors significantly in students. The overarching theme through all the studies was that providing more opportunity for physical activity significantly increases positive behavior in both girls and boys at all institutional levels (Lorenz et al., 2020). Specifically, Watson et al. (2017) found that the main effect of increased physical activity in school was an increase in on task behavior. This is consistent with the CDC's study (2010), which found that one of the main positive effects of intentional physical activity breaks in the classroom, in addition to concentration and respect, was on task behavior.

The combination of the decrease in undesired behaviors and the increase in desired behavior in students makes intentional physical activity breaks a crucial addition to the school day for all students. Although this issue has been intensified by the Covid-19 pandemic, lack of physical activity in schools and the resulting poor behavior is one that originated far before the pandemic and is sure to persist afterward without intervention.

### **Literature Review**

Behavior management in the classroom environment is one of the issues teachers face as they enter a classroom with new students each year. This process can take time and can often involve trial and error with many different tactics such as attention grabbers, classroom rewards, or brain breaks. As educators, it is important to have a managed classroom, which can often mean tailoring those management skills to what students are asking for. In a world that is increasingly sedentary, especially with the emergence and overtaking of the Covid-19 pandemic,

many students are not reaching their recommended levels of physical activity, which can affect their behavior and their overall learning (Dunton, Do, & Wang, 2020).

### **Effects of Covid-19 on Kids' Physical Activity**

The Covid-19 pandemic has impacted the day-to-day life of American youth in many significant ways. Perhaps one of the most significant ways students have been impacted is a decrease in physical activity and an increase in sedentary behavior (Bates et al., 2020). Physical activity benefits children in many ways including emotional regulation, cardio metabolic health, and bone density. (Bates et al., 2020). Similarly, when children are given exposure to the proper amount of physical activity in their youth, they are more likely to bring that with them into adulthood and continue these healthy habits (Dunton, Do, & Wang, 2020). Physical activity is crucial for students, which is why many people call it a public health issue (Dunton, Do, & Wang, 2020).

The Covid-19 pandemic and the resulting stay-at-home orders and restrictions have taken a large toll on the physical activity of many students in America. Many states closed schools from mid-March to the end of the 2019-2020 school year, with most schools still not reopened (or not reopened at full capacity) by December of 2020; this resulted in many students, depending on the school and district, losing their physical education classes and losing many of the opportunities they had in their day for physical activity, such as recess (Dunton, Do, & Wang, 2020). Without recess and other forms of play throughout the day, such as extracurricular sports, walking to and from school, and time spent at the park with friends, the recommended daily amount of physical activity for children goes up 30%, and based on previous research, during this stay-at-home period, this must include home-based exercise, dancing to music, or walk/runs safely outdoors (Chtourou et al., 2020). In all aspects, the daily, built-in physical

activity for children has significantly decreased, and they are forced to supplement with their own in-home workouts and activities.

Students all over the world have had their physical activity impacted due to the Covid-19 pandemic, not just students in the United States. One study conducted in Australia examined the impact that Covid 19 had on kids' physical activity levels during the summer of 2020 (Reece et al., 2020). Researchers asked children and their guardians how many days per week that the children were physically active for at least an hour and how often that students were on screens, as that is a direct opposition to physical activity (Reece et al., 2020). This study had unique results. Reece et al., (2020) found that the influence that Covid-19 had depended a lot upon their socioeconomic strata and that, if left unchecked, the negative impacts that they are seeing could threaten more of an inactivity rate for Australia. Another international study, this time in Germany, compared the screen time and physical activity time of over a thousand 4-17 year old children before and during the Covid-19 pandemic (Schmidt et al., 2020). This German study found results that were vastly different from the results found in most of the studies conducted in the United States. Schmidt et al. (2020) found that, although sports-based physical activity decreased for the children, habitual physical activity increased which led to an overall increase in physical activity during the time of Covid-19. The new and different takes that international studies bring to the table gives good perspective how different countries are handling the pandemic and how the pandemic is affecting its residents.

### **Physical activity in schools**

There is a lot of research to back the importance of physical activity for the physical wellbeing of children and students. In fact, Brusseau (2015) stated that understanding how physical activity affects students' bodies is a crucial first step in creating interventions to

effectively alter student behavior. Brusseau (2015) gave each student a pedometer and used it to understand how school-based physical activity affected the overall daily physical activity of students. Although classroom-based physical activity was not the focus of this study, another study conducted by Berschwinger and Brusseau (2013) found that classroom-based physical activity could provide the students with upwards of 1000 additional steps per day on their pedometer. Due to the findings of these two studies, classroom-based physical activity, along with Physical Education (PE) classes and regular recess, has been recommended as an important part of school physical activity programming (Brusseau, 2015).

It has been recommended that students receive at least 60 minutes of daily physical activity, and many students are not reaching that mark at home (CDC, 2010). Therefore, schools have been identified as the most effective way to create physical activity interventions for children (Erwin et al., 2011). This includes low-cost, teacher-directed classroom physical activity interventions that occur outside of regular physical education and recess time. It has been found that these teacher-directed, classroom-based interventions can be every effective in improving the overall physical activity levels of students (Erwin et al., 2011). Quality physical education, recess, and before and after school programs combined with one intentional physical activity break provided by the teacher during the school day created a comprehensive physical activity program that can help students physically, academically, and behaviorally (Erwin et al., 2011)

### **Effects of physical activity on students' academic performance**

Physical activity is an important tool for teachers in helping students to be the best that they can be academically. In fact, many people would argue that schools have the unique opportunity to help students to become healthier and more active (Active Living Research, 2015). Active Living Research (2015) found that physical activity can have both immediate and

long-term academic benefits for students in the classroom. The major immediate effects that physical fitness has is that it increases students' focus on academic concepts and activities almost instantly upon completing physical activity (Active Living Research, 2015). Long term, provided that students are participating in appropriate physical activity, students should see many benefits, specifically in math, reading and writing, that can likely be attributed to their physical activity and active lifestyle (Active Living Research, 2015). This is just one of the many studies related to the effects of physical activity on students' academic performance.

There are many ways in which physical activity positively affects students' academic performance. In fact, many students respond with greater accuracy to a variety of different academic tasks after participating in just a short session of physical activity (Committee on Physical Activity and Physical Education in the School Environment, 2013). Another study, conducted by Basch (2011), studied how children's physical health affects their academic performance. Basch (2011) argued that the health problems that students have, including lack of physical activity, affects their motivation and overall ability to learn. Basch (2011) also states that that no matter how qualified the teachers are, if the students are not getting the proper amounts of physical activity, their academic achievements will be limited. As outlined by all the studies mentioned above, both executive functioning and focus underlies a lot of the students' performances academically, and these are also the functions that are most impacted by physical activity; this shows that, with the addition of physical activity through recess, Physical Education (PE) class, and daily activity, the students can perform better on their academic tasks (Committee on Physical Activity and Physical Education in the School Environment, 2013).

Researchers specifically looking at the research behind how physical activity impacts student academic achievement have found that the two academic areas most impacted are test

scores and time on task (Conner, 2019). In one study conducted by Donnelley et al., (2017), when extra physical activity was provided to students, their test scores increased in math, reading and spelling. In addition, lower scoring students had the largest positive change in standardized test scores post physical activity intervention, as students with more room for improvement tend to gain more from the interventions (Resland et al., 2018).

The Center for Disease Control (CDC) itself put out a journal that was looking at the association between school-based physical activity and academic performance. The researchers were looking at ten different intervention studies, and although the results were across the board, they had some similar trends. In fact, eight of the ten researchers found positive associations between school-based physical activity and student academic achievement (CDC, 2010). These researchers found that extending physical activity in schools and including intentional physical activity breaks is positively associated with both academic achievement and attention in the classroom, which also ties into behavior (CDC, 2010). Although there were some researchers in this journal that reported more mixed results, none of the studies showed negative associations between physical activity breaks and academic achievement and focus. A few of the studies in this journal just found no differences across the intervention conditions (CDC, 2010).

Many researchers examined the effect of physical activity on overall academic performance, but Hraste et al. (2018) specifically looked at the effect of physical activity on math performance. This researcher focused on a more integrated approach and had the students physicalize the lessons that they are learning, specific to geometry (Hraste et al., 2018). They found that this integrated approach, combined with some intentional physical activity breaks, impacted many different aspects of students' academic achievements (Hraste et al., 2018). Specifically, the students used more critical thinking skills and retained more information from

that lesson on geometry than the students who did not use the integrated approach and intentional physical activity breaks (Hraste et al., 2018).

### **Effects of Physical Activity on Students' Behavior**

In addition to physical activity affecting the academic performance of students, there are also many studies that show that it has a strong effect on students' behavior, specifically in the classroom. Researchers set out to understand the relationship between classroom/school-based physical activity and the students' behavior (Carlson et al., 2015). Carlson et al. (2015) found that adding physical activity into their classroom routine was negatively associated with lack of effort academically, but also with students being inattentive and off task. In the end, this same study goes on to suggest that students should, for maximum behavioral benefits, have physical activity breaks structured into their school day (Carlson et al., 2015). As shown in this study, physical activity can increase good behavior from students in the classroom.

Although many researchers have found that increasing physical activity was effective for increased desired behaviors and decreased undesired behaviors, not all students experienced the same effects (Lorenz et al., 2020). The effects of physical activity on behavior can be vastly different for boys vs. girls, students with Attention Deficit Hyperactivity Disorder (ADHD) vs. students without a diagnosis, and students at different grade levels, among other things. However, the overarching theme through all the studies was that providing more opportunity for physical activity significantly increases positive behavior in both girls and boys at all institutional levels (Lorenz et al., 2020).

The CDC published a journal article where researchers examined multiple studies that focused on the association between school-based physical activity and academic performance. Although the journal and the studies the CDC examined were focused primarily on academic

performance, in the process they found that the school-based physical activity had many associations with classroom behavior as well (CDC, 2010). While many of the studies only looked at academic associations, few of the studies mentioned in the journal found that the physical activity breaks impacted students' on-task behavior, concentration, and respect in the classroom in positive ways (CDC, 2010). The CDC (2010) also found that, while many of the studies saw no positive associations with student behavior, none of the studies saw a negative association with student behavior either, and that levels of negative student behaviors maintained steady or increased.

Not much different from what was found in some of the studies previously mentioned, some studies have not been successful in finding much positive impact that physical activity has on academic behaviors. The results do not show negativity, but many are not showing overwhelmingly positive results. Many researchers' results show that intentional physical activity breaks may have a positive impact on academic behavior, but they are unable to come to definite conclusions (Watson et al., 2017). This uncertainty is usually due to the lack of specificity in interventions as well as in description of behaviors, and could be improved by using some sort of objective way to measure physical activity and their effects on behavior (Watson et al., 2017). When they did get results, the *International Journal of Behavioral Nutrition and Physical Activity* highlighted that the main effect that researchers were seeing was an increase in on task behavior and a decrease in off task behavior (Watson et al., 2017). This is consistent with the CDC's study (2010), which found that one of the main positive effects of intentional physical activity breaks in the classroom, in addition to concentration and respect, was on task behavior.

Howie, Beets, and Pate (2014) looked at 4<sup>th</sup> and 5<sup>th</sup> grade students' behaviors in the classroom. They began by observing students' behaviors in the class during seat work when the students were sedentary. They then looked at the same students and their behavior after having an intentional physical activity break (Howie, Beets, & Pate, 2014). They found that all negative behaviors, and specifically off task behavior, decreased significantly after the physical activity intervention (Howie, Beets, & Pate, 2014). In addition, Schmidt, Benzing, & Kramer (2016) found that students between the ages of 11 and 12, when given the opportunity for intentional classroom-based physical activity breaks, decreased their off-task behavior time and increased engagement during instruction. Both studies showed that physical activity positively impacts student behavior in the classroom.

### **Other Interventions for Student Behavior**

#### ***Class-Wide Function-Related Intervention Teams***

Although physical activity is an intervention that many researchers are using to try and influence student behavior, there are many other interventions that have been used by researchers around the world in studies looking at student behavior. One of those interventions, used by Wills et al. (2019), was class-wide function-related intervention teams, or CW-FIT. CW-FIT is a multitier intervention strategy that helps teachers to better manage student behavior (Wills et al., 2019). This intervention focuses on teachers giving students praise specific to their behavior, providing reinforcement that is differentiated, and setting classroom expectations to teach behaviors that are functional and support students' engagement (Wills et al., 2019). Wills et al. (2019) found that this intervention improved the students' behavior, and specifically their on-task behavior, both class-wide and in individual students. Although this was a middle school

study, Willis et al. (2019) found the effects of the implementation of CW-FIT on student behaviors was consistent with other studies done in elementary schools.

### ***Mindfulness and Meditation***

Another method, mindfulness, has proved to influence student behavior (Black & Fernando, 2015). Black and Fernando (2015) implemented a five-week mindfulness and meditation curriculum on students between Kindergarten and Sixth grade. After the five-week study, students' classroom behavior improved in terms of student attention span, self-control, participation, and respect for at least seven weeks after the final intervention (Black & Fernando, 2015). Martinez and Zhao (2018), conducted a similar intervention as Black and Fernando (2015), and predicted that younger adolescent students may show negative behaviors at school because of the high levels of stress in their lives, thus needing some mindfulness and meditation. These researchers specifically looked at if mindfulness and meditation impacted student behavior enough to limit the number of times that students were sent to the office for discipline (Martinez & Zhao, 2018). The researchers found that when students were exposed to mindfulness and meditation training, they were better able to self-monitor and redirect their behavior, which led to decreased disciplinary action, specifically, being sent to the school office (Black & Fernando, 2015). Both Black and Fernando (2015) and Martinez and Zhao (2018) showed that increasing mindfulness and meditation in schools could have a positive impact on student behavior.

### ***The Art Room***

In addition to both CW-FIT and mindfulness and meditation practices, DPhil & Fazel (2015) found that art can also be used as an effective intervention for students with emotional and behavioral difficulties. DPhil & Fazel (2015) used *The Art Room* intervention, which is an intervention whereby teachers use art therapy for students and looked for the behavioral and

emotional affects. In this intervention, in addition to doing art projects, students also have opportunities to discuss the difficulties or successes that they have been facing in their day (DPhil & Fazel, 2015). The results showed significant reduction in behavioral and emotional difficulties in all areas besides conduct problems, which had some improvement that was not significant (DPhil & Fazel, 2015). Overall, all three of these studies showed that there are many different interventions, not all of them related to physical activity, that can affect student behavior in positive ways.

### **Conclusion**

Classroom management, specifically behavior management, is a complex issue that teachers are facing each year, especially because student behavior can be affected by many different things, to include physical activity levels (Carlson et al., 2015). Due to Covid-19, students have become increasingly sedentary over the past year and have not been reaching the recommended amount of daily physical activity (Dunton, Do, & Wang, 2020). As educators, it is important to make sure students are given what they need to be able to thrive in the classroom academically and behaviorally. This could mean having physical activity breaks structured into their school day (Carlson et al., 2015). In summary, though Covid-19 denied many students their regular physical activities, classroom based physical activity intervention has proven to have long-term academic (Active Living Research, 2015) and behavioral benefits (Lorenz et al., 2020) for students in the classroom.

### **Question**

In what ways do intentional physical activity breaks affect students' behavior in the classroom?

### **Theory of Change**

The purpose of this study was to test whether intentional physical activity breaks during the school day would have positive effects on the behavior of students during class time and increase their on-task behavior. The goal was to have consistent desired and on-task behavior and to help the students understand tactics to self-regulate. I anticipated that the intentional physical activity breaks would increase desired student behaviors while the undesired behaviors would remain stagnant or decrease slightly. I also anticipated that the overall ratio of desired to undesired behavior in students would increase due to the increase in desired behavior. This anticipation is consistent with most of the research that, although physical activity breaks do not decrease negative behaviors (Watson et al., 2017), they increase positive behaviors and allow for maximum behavioral benefits in students (Carlson et al., 2015).

### **Methodology**

The researcher studied the effects of implementing intentional physical activity breaks during the school day on fifth grade students' behavior in the classroom. A desired focus was on whether the implemented intentional physical activity breaks had positive effects on behavior for all.

Baseline data was collected through a frequency tally sheet on student behavior, anecdotal notes, and student self-assessment (Hendricks, 2017). The frequency tally sheet and anecdotal notes were kept constantly throughout and just before the study. The data collected was qualitative due to the behavioral nature of the data that was analyzed. The tally charts, student assessments, and anecdotal notes all provided qualitative data. The student self-assessment was given as a pre-assessment and post-assessment (after five weeks of intervention). Language was modified to fit a 5th grade level.

**Context**

This study took place in a private, Catholic, K-8 school in an affluent, urban community in the Pacific Northwest. Data was taken throughout the school day (between the hours of 8:10 and 2:00) with interventions given at 11:10 (after first recess and before lunch) and 1:10 (between lunch/second recess and end of day). Students had two recess' per day: a fifteen minute one at 10:15 and a thirty minute one at 12:15. Students also had physical education (PE) class twice a week for 45 minutes.

**Participants**

The participants in this study were 13 fifth grade students in a private, Catholic school. This group of students was one cohort of a full class of 28 students. These cohorts were required due to safety protocols surrounding the Covid-19 pandemic and were selected randomly by the teacher and I. In this cohort of thirteen students, there were seven females and six males. Student consent forms were used to determine the students' willingness to be involved in this six-week study. There was little to no diversity in this cohort as all students self-identified as Caucasian. There were no students on Student Learning Plans (SLPs) or who received support through the resource teacher.

**Intervention**

The intervention in this study was intentional physical activity breaks built into the school day. Classroom-based physical activity, along with Physical Education (PE) classes and recess, has been recommended as an important part of school physical activity programming (Brusseau, 2015). Physical activity has been shown to have a positive impact on student behavior, and Carlson et al. (2015) argues that students should, for maximum behavioral benefits, have physical activity breaks structured into their school day.

During Week 1 of the study, baseline behavioral data was collected through tally sheets, a student pre-assessment, and teacher notes. The researcher collected data on how many times each student performed a desired or undesired behavior throughout the day. The researcher kept track of data. The student pre-assessment was used to assess students on how they felt their week went behaviorally and regarding their focus in class. The teacher recorded any anecdotal evidence of student behavior throughout the week.

Throughout Weeks 2-6, intentional physical activity breaks were implemented. These physical activity breaks were implemented twice a day (once at 11:10 and once at 1:10) and were 2-5 minutes long. These physical activity breaks included a variety of activities, such as dance, yoga, circuit workouts, and agility/strength training. The researcher primarily collected data on student behavior via the tally sheets. These were the same tally sheets that the researcher collected data on in Week 1 and measured the same student behaviors. The teacher notes also remained the same from Week 1 and gave the researcher the ability to collect anecdotal data regarding the student behavior when physical activity breaks were implemented. Finally, students were given a post-assessment on the final day of the study in Week 6. It was exactly the same as the assessment given in Week 1, and showed how they felt their behavior was affected by physical activity and how they felt their behavior and focus had changed over the past six weeks.

After the data was collected over the course of six weeks, the researcher examined the data from prior to implementing the physical activity breaks, during the implementation, and post-implementation. Data from the tally sheets, anecdotal notes, and students' assessments were analyzed to help the researcher understand if and how the implementation of intentional physical activity breaks affected students' behavior in the classroom.

**Data Gathering Instruments/Assessments**

**Assessment #1: Pre- and post- student self-assessment.** These assessments (Appendix A) were given to students to measure their perception of physical activity levels in school, their own desired and undesired behaviors, and how those behaviors are affected by physical activity.

The first page of this assessment asked the students, on a scale of 1 to 5, how much they enjoyed physical activity and whether they felt they got enough physical activity on a regular school day. The second page of the assessment gave the students a list of desired and undesired behaviors and asked the students to indicate which behaviors they felt they had participated in in the last two weeks as well as asking them if they believe their physical activity level impacts the amount that they participate in any of these behaviors. Baseline data was taken through this assessment on the first day of the study prior to any intervention. There were no intentional physical activity breaks (besides PE and recess) prior to this pre-assessment. An exact duplicate of this assessment was given on the final day of the study after five weeks of intervention.

**Assessment #2: Behavior Tally Chart** This assessment (Appendix B) was used each school day to measure the desired and undesired behavior count for each student.

The behavior chart measured five desired behaviors: being on task during work time (working on the task at hand, working quietly), raising their hand for attention, following oral or written directions, doing something the first time they were asked, and turning in their work on time. The researcher used the chart to measure five undesired behaviors: tapping, not raising their hand, being off task during work time (talking to a friend, doing other work, coloring, etc.), talking while the teacher or student is talking, and not following safety protocols (not staying in bubble, removing mask, getting closer to peers). Each day of the study (both pre-intervention and during the intervention), the researcher had a behavior tally sheet printed for each student

and wrote down tallies every time a student did a behavior on the list, whether desired or undesired. These tally sheets were analyzed weekly to track changes as well as the ratio of desired to undesired behavior.

The behavior tally chart was designed to track the number of desired and undesired behaviors that each student was doing each day and to track how those behaviors, both desired and undesired, were affected by the intervention.

**Assessment #3: Anecdotal Notes** The anecdotal notes (Appendix C) were taken by the teacher/researcher throughout the school day each day in order to take note of significant moments in student behavior, both desired and undesired, and note any significant differences from the day before.

The anecdotal notes sheets were kept with the behavior tally sheets each day. The researcher would make note of any behavior incidents or breakthroughs made throughout the six weeks (both pre-intervention and during the intervention) that needed to be described anecdotally. Only behaviors of note were documented, so not every student was included each day.

The anecdotal notes sheet was designed to add context to the behavior tally sheet (Appendix B) as well as to keep track of any breakthroughs in desired behaviors and significant incidences of undesired behaviors. In addition, it allows the researcher to anecdotally note any specific differences from the day before.

## Results

In this qualitative study, the researcher set out to determine how intentional physical activity breaks during the school day affected student behavior. The participants for this study were comprised of thirteen fifth grade students: 6 males and 7 females. At the end of the six-week study, the researcher determined the ratio of student desired to undesired behaviors. In addition, the researcher analyzed the raw number of each desired and undesired behaviors and how those quantities changed with each week of the intervention. Finally, the researcher analyzed the students' self-assessments (both pre- and post-intervention) of whether they felt physical activity impacted the amount that they performed desired and undesired behaviors.

### Ratio of Desired to Undesired Behaviors

At the end of each week, the total number of desired and undesired behaviors was tabulated from the tally sheets (Appendix B). The ratio of total desired behaviors to total undesired behaviors was calculated and recorded at the end of each week. In Weeks 4 and 6 the ratio of desired to undesired behaviors was observed to be 7.4 and 9.8 desired behaviors for every one undesired behavior, respectively. Week 5 was the exception to this, as the ratio decreases to 4.8 from 7.4 desired behaviors for every one undesired behavior in Week 4 and increases again to 9.8 desired behaviors for every one undesired behavior in Week 6. Generally, over the course of the six-week study, the average number of desired behaviors increased from 2.2 to 9.8 desired behaviors for every one undesired behavior.

### Individual Undesired Behaviors

Students' individual undesired behaviors were tracked across the six-week study (Appendix D). Baseline data were collected through behavior tally sheets (Appendix B) and anecdotal notes (Appendix C) and compared to data collected using the same instruments when

students were having two intentional physical activity breaks per day. Relative to baseline, undesired behaviors were decreased in Week 6, though no consistent pattern was observed. Undesired behaviors observed to be decreased at baseline relative to Week 6 were tapping (11 times in Week 1 and 3 times in Weeks 6), not following the safety protocols (25 times in Week 1 and 3 times in Week 6), being off task (47 times in Week 1 and 35 times in Week 6), and talking while a teacher or student is talking (40 times in Week 1 and 29 times in Week 6). Not all undesired behaviors were increased post intervention. Students were observed not raising their hand 66 times in Week 6, which increased from 34 times in Week 1.

### **Individual Student Desired Behaviors**

Students' individual desired behaviors were tracked throughout the six-week study (Appendix E). Baseline data were collected through behavior tally sheets (Appendix B) and anecdotal notes (Appendix C) and compared to data collected using the same instruments when students were having two intentional physical activity breaks per day. The data collected for desired behaviors showed a clear increasing trend in every behavior that was tracked. All five desired behaviors were observed to be increased in Weeks 4 and 6 relative to baseline. The total number of desired behaviors increased substantially from Week 1 to Week 6. During Week 1, the number of observations of each desired behavior ranged from 34 and 102, by Week 4 these quantities ranged from 53 and 178, and by Week 6 were between 204 and 303. In addition to the number of observations, each of the five desired behaviors followed a similar pattern: all exhibited a sharp increase in Week 2, decreased slightly in Week 3, remained stagnant 4 and 5, and had a sharp increase at Week 6.

**Student Awareness**

Students were also assessed on their awareness of whether physical activity impacts how often they perform desired and undesired behaviors in a two-week period (Appendix F). Baseline data were collected through the student self-assessment (Appendix A) and compared to data collected using the same assessment when students had finished the study and had five weeks of intentional physical activity breaks twice a day. The data showed very little change in student awareness from the baseline assessment to the end of the study assessment. On day one of the study, 62% of students thought that the amount of physical activity they got did impact the amount they performed desired and undesired behaviors and 38% of students thought it did not. After the six-week study where students had two intentional physical activity breaks per day, 54% of students thought that the amount of physical activity they got impacted the amount they performed desired and undesired behaviors and 46% thought it did not.

**Discussion****Conclusions**

Based on the results of the study, the researcher concluded that putting intentional physical activity breaks into the school day increased the overall ratio of desired to undesired behaviors in students. Overall, the results showed that when students were given intentional physical activity breaks throughout the day, they had a higher ratio of desired to undesired behaviors throughout the week. Therefore, introducing intentional physical activity breaks into the school day had a positive effect on the ratio of desired to undesired behavior in students.

The researcher concluded that putting intentional physical activity breaks into the school day increased desired behavior in students. The baseline data from the behavior tally sheets (Appendix B) and the anecdotal notes (Appendix C) showed that students were observed

performing each desired behavior between 34 and 102 times. By Week 4, the number of observations of desired behaviors was between 53 and 178, and by Week 6, the observations of desired behavior were between 204 and 303. These results showed that when students were given intentional physical activity breaks throughout the day, they performed more desired behaviors throughout the week. Introducing intentional physical activity breaks into the school day had a positive effect on student's desired behaviors.

In addition, the researcher found that the data did not support intentional physical activity breaks impacting student undesired behavior. The researcher documented students' behavior on data tally sheets (Appendix B) and anecdotal note sheets (Appendix C). The data showed that, although many of the undesired behaviors decreased in number of observations from the baseline data in Week 1 to Week 6, there was no consistent pattern. In addition, not all undesired behaviors ended up being observed less than during the baseline week. Students were observed not raising their hand 66 times in Week 6, which increased from 34 times in the baseline week. The outcome showed that implementing intentional physical activity breaks into the school day had very minor effects on students' undesired behavior.

Finally, the researcher confirmed that the data did not support physical activity breaks impacting student awareness of the effects of physical activity on their behavior. The data collected by the student self-assessment (Appendix A) showed very little change in student awareness from the baseline assessment to the assessment at the end of the study. In the post-assessment, only 54% of students thought that the amount of physical activity they got impacted the amount they performed desired and undesired behaviors. This showed very little change in student awareness, and, therefore, illustrated that implementing intentional physical activity breaks into the school day had little to no effect on student behavior.

**Action Research Cycles**

Data in this study was reviewed using the action research protocol. The researcher went through the action research cycle once. The problem was identified as the lack of physical activity in schools, particularly during the Covid-19 pandemic, and the resulting undesired behaviors in the classroom. The researcher then developed a plan of action and decided to implement two intentional physical activity breaks into each school day to examine its impact on student behavior. The researcher then began collecting data on student behavior through behavior tally sheets, anecdotal notes, and student self-assessments. Baseline data was first collected for one week with no intentional physical activity breaks and then collected for five weeks after with two intentional physical activity breaks per day. The researcher then analyzed the data and found that the data supports the fact that intentional physical activity breaks increased desired behavior in students. If the researcher was going to do another cycle through the action research cycle, the instruction would be adjusted by altering the timing of the interventions as well as tracking behaviors separately in the morning and afternoon. The researcher would then begin the cycle over again with these adjustments.

**Implications or relevance**

The Covid-19 pandemic has affected students everywhere in a wide variety of ways, but perhaps one of the most significant ways students have been impacted is a decrease in physical activity and an increase in sedentary behavior (Bates et al., 2020). With this lack of physical activity in their daily schedule, students struggle to regulate their behavior in class and, therefore are being observed performing more undesired behaviors and less desired behaviors in the classroom. In a world that is increasingly sedentary, especially with the emergence of the Covid-

19 pandemic, many students are not reaching their recommended levels of physical activity, which can affect their behavior and their overall learning (Dunton, Do, & Wang, 2020).

At the beginning of this study, it was anticipated that the intentional physical activity breaks would increase desired student behaviors while the undesired behaviors would remain stagnant or decrease slightly. It was also anticipated that the overall ratio of desired to undesired behavior in students would increase due to the increase in desired behavior. This anticipation is consistent with most of the research that, although physical activity breaks do not decrease negative behaviors (Watson et al., 2017), they increase positive behaviors and allow for maximum behavioral benefits in students (Carlson et al., 2015). The findings of this study were consistent with the predictions made as well as the research supporting those predictions. Based on the results, when intentional physical activity breaks were implemented, an increase was observed in desired student behaviors as well as the ratio of desired to undesired behaviors. In addition, the researcher found that when intentional physical activity breaks were implemented, little to no changes were observed in undesired behavior as well as in student awareness of how the physical activity impacts their behavior.

This research will impact the education field because, by integrating physical activity breaks into the school day, students were able to increase their overall physical activity levels and were observed to perform more desired behaviors and increase their weekly ratio of desired to undesired behaviors. These findings were confirmed by the research of Carlson et al. (2015), which states that, for maximum behavioral benefits, students should have physical activity breaks structured into their school day (Carlson et al., 2015). Although all students have different focus levels, needs, strengths, and weaknesses, the patterns observed in both the desired behaviors and the ratio of desired to undesired behaviors were consistent for all students. This

was also an overarching theme through all the research, which concluded that providing more opportunity for physical activity significantly increases positive behavior in both girls and boys at all institutional levels (Lorenz et al., 2020). Integrating physical activity breaks into the school day increases students' overall daily physical activity rates, and can therefore increase their desired behavior.

### **Limitations**

Throughout this six-week study, there were several limitations. First, several students were absent during Week 5 and the data were impacted by those absences. Second, the researcher was also the main teacher in this classroom. This made it hard for the behavior observations to be completely accurate as the researcher also had to be full time teaching. As the study progressed, the teacher gained skill in teaching and recording behavior observations simultaneously which means that the results likely were more accurate. Third, the student self-assessment primed students to know the behaviors (both desired and undesired) that the researcher was observing them on. On day one of the study, the student self-assessment listed all the desired and undesired behaviors that would be tracked and asked the students to self-identify the behaviors they exhibited in the last two weeks. This could have led to potential biases and led to the experiment not being completely controlled. Finally, the study was limited to only one school, and one cohort of thirteen fifth grade students. The results were limited to one Catholic school class. The results of the research cannot be generalized to other classroom settings.

**Recommendations**

There are four recommendations to improve and redesign the study. First, I would recommend using different behavior tally sheets and anecdotal notes sheets for the morning and afternoon. This would add another factor into the study, and would be helpful in identifying behavior patterns and when future physical activity interventions might be most effective. Student behavior, both desired and undesired, could be very different based on time of day, as could the effectiveness of the physical activity intervention.

Next, I would suggest conducting the study over a longer period of time. I would do this so that I could see some of the long-term effects of the physical activity breaks on student behavior. In addition, the longer study length would provide opportunities to implement some of these recommendations and give them time to see if they take effect.

The third recommendation would be to experiment with placing the physical activity breaks at different times during the day. During this study, the times of the physical activity breaks remained consistent throughout the six weeks (one at 11:10 am and one at 1:10 pm). The breaks could have had a different effect if placed at different times during the day and/or there could be specific times during the day where the students need them more.

The final recommendation would be to make some adjustments to the student self-assessment. First, I would remove the section that asked students to fill in the desired and undesired behaviors that they believed they had performed in the last two weeks. The two-week period was too long for students to be able to accurately reflect on, and they were often more aware of their desired behaviors than their undesired behaviors. In addition, it made the experiment less controlled as it primed students with the behaviors on which they would be observed. Next, I would add an open-ended question. For example, "How does physical activity

affect your behavior?”. The open-ended question would encourage students to reflect a little deeper on their behaviors and be more specific on how physical activity affects them rather than answering a yes or no question about if they were affected.

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Appendix A

# Self-Assessment

How do you feel about physical activity?

I don't  
like it at  
all!

I  
somewhat  
dislike it

It's okay

I sort of  
like it

I love it!

1

2

3

4

5

Do you feel like you get enough physical activity at school?

YES

NO

Sometimes

## Appendix A Continued

# Self-Assessment

Which behaviors do you feel that you've done daily the past two weeks?

- Turning in work on time
- Being off task during work time (talking to friends, doing other work, coloring, etc)
- Not raising my hand before answering a question
- Talking while a teacher or student is talking
- Being on task during work time (working on the task at hand, working quietly)
- Tapping
- Not following safety protocols (not staying in bubble, mask off)
- Following oral or written instructions
- Doing something the first time I'm asked

The amount of physical activity I get impacts the amount I do any of these behaviors:

- TRUE**       **FALSE**

**Appendix B**

## Behavior Tally Chart

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

| Undesired Behavior                                                                            | Desired Behavior                                                        |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Tapping                                                                                       | On task during work time (working on the task at hand, working quietly) |
| Not raising hand                                                                              | Raising hand for attention                                              |
| Off task during work time (talking to friends, doing other work, coloring, etc.)              | Following oral or written directions                                    |
| Talking while teacher or student is talking                                                   | Doing something the first time they are asked                           |
| Not following safety protocols (not staying in bubble, removing mask, getting close to peers) | Turning in work on time                                                 |

Appendix C

## Researcher Notes

Student: \_\_\_\_\_ Date: \_\_\_\_\_

Anecdotal Notes:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

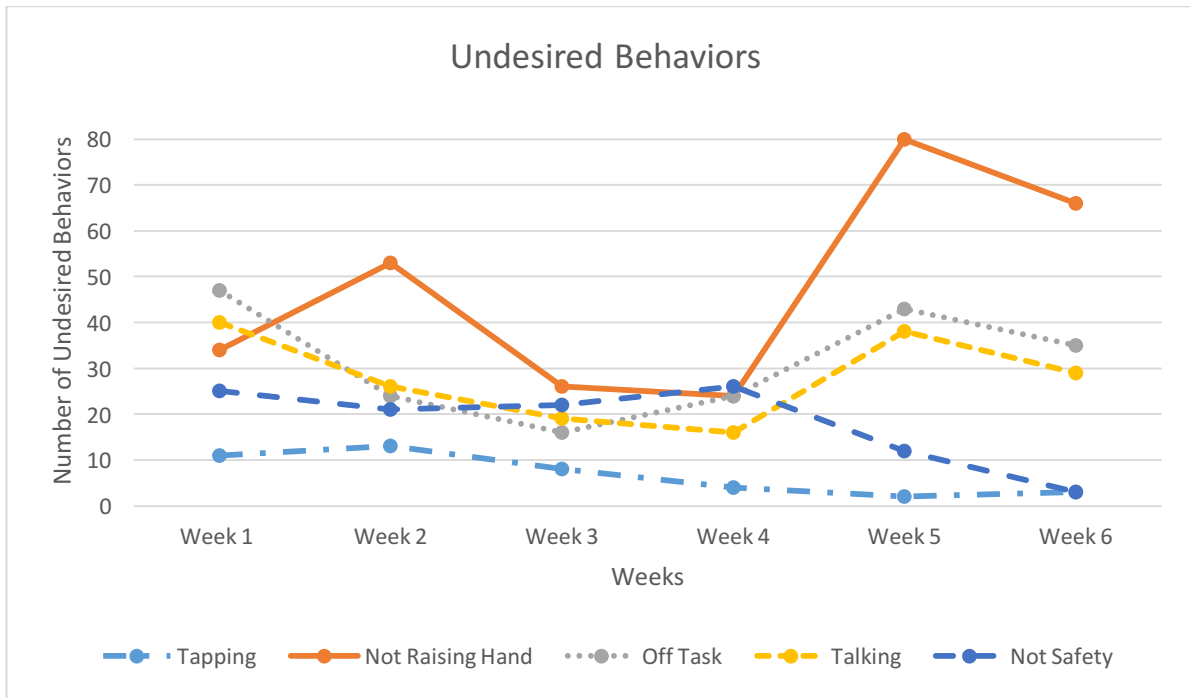
Differences from yesterday:  
\_\_\_\_\_  
\_\_\_\_\_

Student: \_\_\_\_\_ Date: \_\_\_\_\_

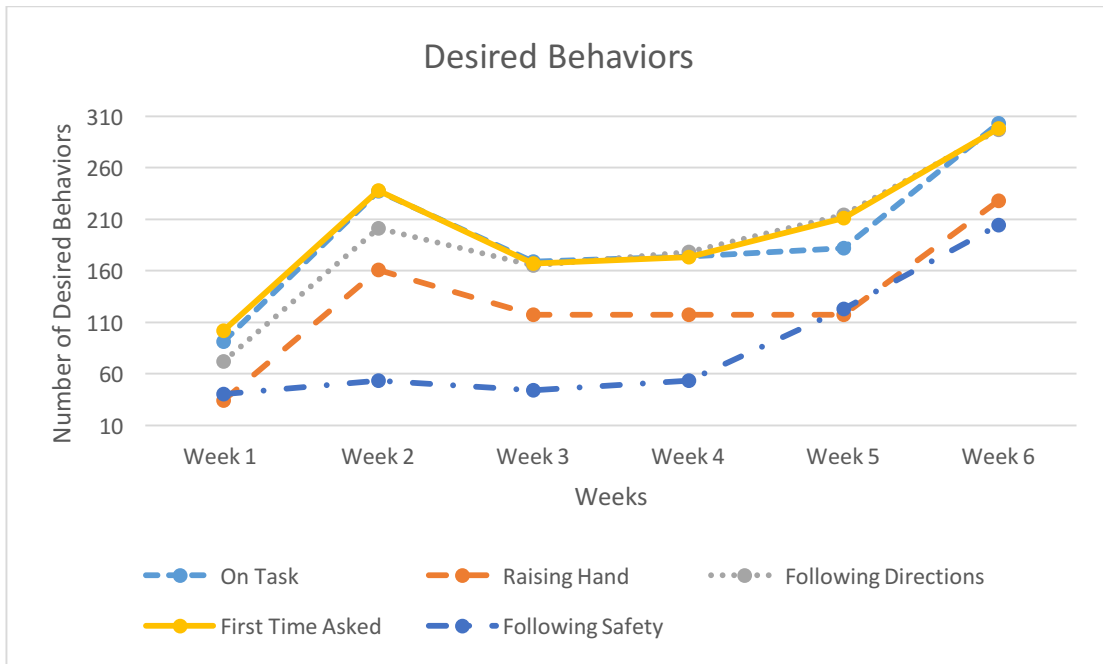
Anecdotal Notes:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Differences from yesterday:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Appendix D



Appendix E



**Appendix F**

