

The Liink Project: Implementation of a Recess and Character Development Pilot Study with Grades K & 1 Children

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Students in the United States have shown little to no improvement in reading, math, and science scores over the past 20 years, and the country presently muddles along in the middle of the pack on national and global assessments (Organization for Economic Cooperation and Development [OECD], 2013). As a result, a disconcerting shift towards increased classroom time has occurred at the expense of unstructured play/recess and/or physical education (Robert Wood Johnson Foundation [RWJF], 2013). This can be attributed to the belief that if classroom content time is increased, students will ultimately become better learners/scholars (Centers for Disease Control and Prevention (CDC), 2010). While the importance of classroom time for students is indisputable, it must be recognized that time spent is only as valuable as the quality of delivery and the willingness of children to receive the information (Pellegrini & Bohn-Gettler, 2013). When students are required to remain seated for much of the seven hours they are in school, many negative behaviors occur, which teachers then attribute to bad children instead of lack of physical activity and cognitive breaks (Turner, Chriqui, & Chaloupka, 2013). As a result, discipline issues, bullying, lack of confidence, self-esteem, and other factors contribute to more of the same – punishment in the form of withholding recess and more sitting in a chair (Barros, Silver, & Stein, 2009; Turner et al., 2013).

Recess, an integral part of the developing child, provides an unstructured, outdoor, unassisted play time encompassing cognitive, social, and emotional health components. Betts and colleagues (2006) suggest that elementary students need breaks throughout their school day because students cannot stay focused for extended periods of time. Recess provides a break during which the brain can “regroup” (Jarrett & Waite-Stupiansky, 2009) and represents an unplanned respite from cognitive tasks affording children time to play, rest, imagine, think, move, and socialize (Murray & Ramstetter, 2013; Pellegrini & Bohn-Gettler, 2013).

The aim of the first year pilot for the *Let's inspire innovation 'N kids Project* (Liink) was to determine whether attentional focus and off-task behaviors changed in K and 1 children after implementing an intervention of three 15-minute recess periods throughout the school day and three 15 minute character development lessons weekly for four months. Currently, elementary public schools in the

United States reflect either one recess of approximately 20 minutes daily or no recess at all daily (RWJF, 2013). Schools also have seen an increase in bullying and other social issues throughout the day in the classroom, hallways, and recess areas (Pellegrini & Bohn-Gettler, 2013). A developmental shift in the approach to a child's learning environment through recess and character development may improve the behavioral actions of the child as well as develop the social and emotional health of the child.

Methods

Participants

The pilot study included K and 1 students (N=126; K = 63; 1 = 63) from a highly reputable private K-12 school in the southwest region of the U.S. There were 32 males and 31 females in kindergarten and 26 males and 37 females in first grade. When this school was considered for the pilot, the students in the lower school, grades K-4, already had a general schedule, which included physical education and one recess daily. The students were used as their own controls for this first year. Baseline data was collected in the fall (October) and treatment data was collected in the spring (April/May).

Intervention

This pilot intervention included two parts: 1) teaching a character development curriculum called Positive Action (three, 15 minute lessons each week) and 2) increasing the amount of time allotted for unstructured, outdoor play (three, 15-minute recesses throughout the day, totaling 45 minutes daily).

Positive Action (PA) Curriculum (2008) is a developmentally specific curriculum designed around seven content areas. The seven subscales include 1) School connectedness; 2) Prosocial; 3) Respect for adults; 4) Honesty; 5) Children's empathy; 6) Bullying; and 7) Engagement and disaffection with learning. The PA curriculum was introduced and explained during the teacher training in the fall and then curriculum implementation was executed in the spring during reading content lessons.

The second part of the intervention was to increase the amount of time allotted during the school day for unstructured, outdoor play. This was an unstructured, outdoor recess increase of 30 minutes daily. The daily physical education class of 45 minutes was to remain in the schedule. Unstructured recess for this intervention was defined as free play that is directed by the children themselves with

no adult influence (Murray & Ramstetter, 2013).

Unstructured, outdoor recess adherence was verified by means of observation. Classroom observers were randomly assigned to appear, unannounced, at one of the recesses scheduled daily to validate that recess occurred for the 15 minutes and each recess period was unstructured, free play for the students.

Measures

Classroom Observation (Marchant, 1989). The observation of students in the classroom utilized a 7-item tool. This tool monitored inappropriate behaviors in the classroom. The following seven behaviors were observed: Off-task Moving (OT-M), Off-task stationary (OT-S), Off-task vocal (OT-V), Off-task low tone (OT-LT), self-injurious, disruptive, and aggressive. OT-M consisted of movement out of the seat or away from the learning area. OT-S involved movement while remaining in same location such as fidgeting. OT-V involved a student speaking with another (only involving a total of two students). OT-LT involved a student staring off into space or head down while clearly not engaged. Self-injurious included behavior harmful to the student such as hitting him or herself. Disruptive was any action that took the attention of three or more students away from the lesson. Aggressive was any harmful behavior directed at another student.

The protocol required the observer (rater) to participate in a six round observation. Each round consisted of a 5-minute behavior observation of one student in 30-second increments. In each 30 seconds, multiple behavior codes could be recorded (i.e. each type of behavior either did or did not occur each of the 30 second increments). For the five minutes an observer tracked the seven different behaviors from above; there were 10 possible times each behavior could be documented. After the 5 minutes were completed, the observer rotated to the next student and repeated for a total of 6 students. During each classroom observation, 2 to 3 raters independently coded behaviors to be able to collect observations on all students in the classroom.

Listening Comprehension Measurement (Bell, 1997). This tool was used to assess the student's ability to listen and comprehend age appropriate stories and respond to reading comprehension questions. The listening comprehension assessment took between 3-5 minutes per student.

A trained diagnostician read students a 3-4 line story and asked the students to answer four to five questions relating back to the passage. If the answer fit related criteria to story content then the student would receive one point for that question. If the answer did not relate to the story then the student did not receive credit (score of 0). A total of nine questions were asked of the kindergarteners and ten for first graders. Scores were calculated as raw and percentage.

Intervention Adherence Measure. This measure was a

self-report validation tool to collect number of times recess and character development were implemented each week. All classroom teachers were provided with this sheet that allowed them to report the number of recesses attended each day by their class and which positive action lesson was taught that day (if any). This recording sheet included a daily calendar with three lines corresponding to the three possible recess times (two before lunch and one after lunch). The teacher would respond with a simple yes or no for each possible recess time and a space for the PA lesson taught.

Procedures

The private school's headmaster and the lower school director were contacted a year in advance of the proposed study to consider the intervention. Different meetings were set up within six months of the study to acquire parent and teacher approval. An approved IRB letter explaining the observation process was distributed at the presentations to each of the parents, then signed and returned before the study began.

Data Analysis

Classroom behaviors were analyzed using correlation coefficients and multivariate analysis of variance (MANOVA) with follow-up univariate analysis of variance (ANOVA). All results were confirmed using nonparametric Mann-Whitney tests. Next, the proportion of listening items correct was computed at pretest and posttest for all students. The proportions were compared at pretest and posttest using a paired sample t-test. An alpha level of .05 was used to determine statistical significance. Teacher self-report was used to calculate the percentage of times recess was done daily by the number of times they were supposed to do the recess daily.

Results

The overall sample included 126 grades K and 1 children. Kindergarten consisted of 63 students and first grade consisted of 63 students. There were 58 males and 68 females total. These students served as their own control group by comparing data from the fall (only one recess and physical education daily) to the data in the spring (three recesses and physical education daily). Students from this study were fairly homogenous: higher socioeconomic class, more parental presence at home, and less medicated (only one student on any medications at all).

One of the concerns about doing an intervention study was whether teachers would adhere to the intervention. Typically, teachers have used recess as a carrot for children to behave in class. The teachers were not able to eliminate recess as a result of bad behavior in a class. They were instructed that recess was considered a content time just as the other contents were scheduled and were expected to adhere to the schedule. In the spring during the intervention, kindergarten teachers reported 82% to 95% recess adherence, whereas the first grade teachers reported 88%

to 97% recess adherence. Less than 5% of the time was recess done indoors as a result of bad weather. Even then, it was unstructured in the classroom where they could move around different areas of play designated by the teacher. Both groups reported 100% positive action adherence for that same period.

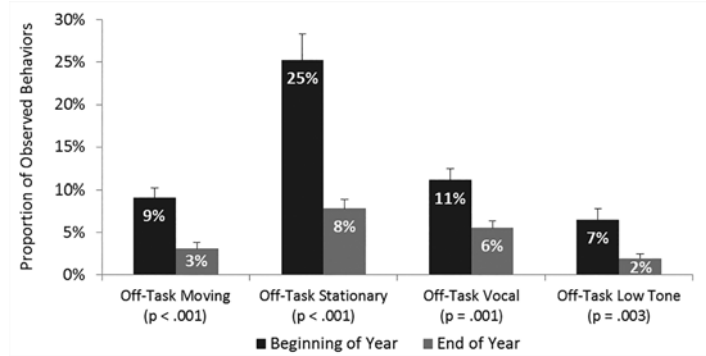
The other concern for teachers was whether transition time (the time to move from classroom to recess and from recess back to settled in classroom) would change as a result of increased number of recesses daily. The transition time to and from recess in the fall (baseline period) was 4 minutes average both ways. The spring intervention time decreased significantly to 50 seconds on average each direction.

Classroom Behaviors

The codes of multiple observers were incorporated to create a single proportion per behavior type per observation. In total, there were a total of 19 observations in the fall semester (N=19) and 17 observations in the spring semester (N=17). With kindergarten there were a total of 10 observations in the fall and 7 in the spring. There were a total of 9 fall observations and 10 spring observations for first grade. This was an average of three observations per classroom.

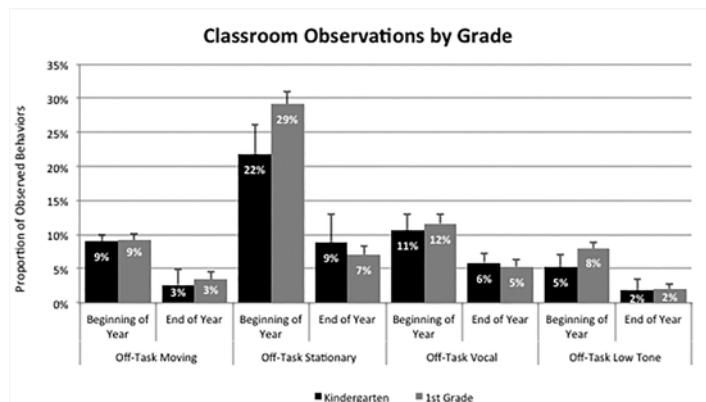
A MANOVA was conducted for differences in the proportions of behaviors from pretest to posttest while accounting for the significant correlations among the proportions of behaviors. The overall multivariate model was significant $F(7, 28) = 9.20, p < .001, \text{partial } \eta^2 = .697$, indicating an overall difference in observed behaviors from pre to posttest. The univariate analyses revealed that the proportion of off-task moving ($F(1, 34) = 19.34, p < .001$), off-task stationary ($F(1, 34) = 26.80, p < .001$), off-task vocal ($F(1, 34) = 12.10, p < .001$), and off-task low tone ($F(1, 34) = 10.42, p < .001$) behaviors were significantly higher at pretest compared to posttest. Although self-injurious, disruptive, and aggressive behaviors decreased, the change was not statistically significant ($p > .05$). Figure 1 displays the proportions of behaviors at pretest and posttest for each of the behaviors that showed a significant decrease. Off-task stationary behaviors (OTS) such as fidgeting or bouncing showed the largest change (17%), although off task moving behaviors (OTM) changed 6% and off task vocal changed 5%. These findings align with other research indicating that overall classroom conduct and academic on-task behavior is higher in students who receive recess (Pellegrini & Bohn-Gettler, 2013) as well as decreasing fidgeting and movement (Barros et al., 2009).

Figure 1. Proportion of observed behaviors at pre and posttest (shown converted to percentages).



A MANOVA was used to examine age and gender for off-task behavior differences from pre to posttest. The results showed no main effect for grade $F(7, 26) = .45, p < .862, \text{partial } \eta^2 = .108$, or interaction between time and grade, $F(7, 26) = .33, p < .932, \text{partial } \eta^2 = .082$. Replicating the overall findings, there was a significant effect of time $F(7, 26) = 9.23, p < .001, \text{partial } \eta^2 = .713$, indicating an overall difference in observed behaviors from pre to posttest while accounting for grade. Figure 2 shows the proportions of the off-task behaviors by grade. As shown, although off-task behaviors reduced from pre to posttest, there were no significant differences between grades. To test gender effects, the proportion of males was correlated with the proportion of each of the off-task behaviors and pre and posttest individually using Spearman’s rho correlations. There were no significant differences between genders ($p > .05$).

Figure 2. Proportion of observed behaviors at pre and posttest by grade (shown converted to percentages). [Note. No significant differences between kindergarten and 1st grade ($p > .05$)]



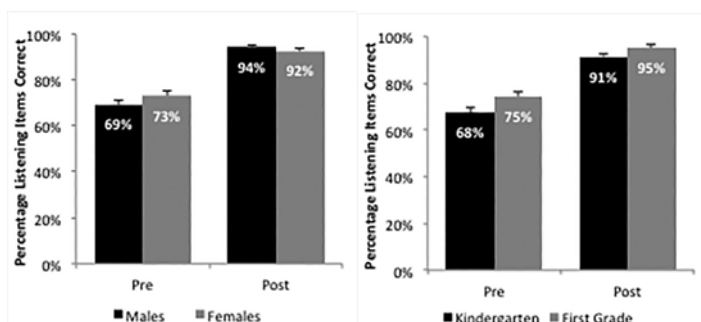
The students in this study did not benefit more by being male or female nor by being in grade K vs grade 1. All students benefited from the additional recesses to impact off-task behaviors. What was most interesting was the fidgeting change was more significant for grade 1 (22%) than grade K (13%). We are attributing this amount of difference in grade level change to the natural amount of movement in the classroom for grade K to very little movement for grade 1. The grade K teachers create more

time for transition between contents, more movement to another task, centers where the children stand and move between areas more often, whereas the grade 1 teachers facilitate more traditional learning at a desk. This pilot study clearly supports more recent research that children still need time to move throughout the developmental years, but the school environment does not create these opportunities for the children in a traditional classroom setting.

Listening

A paired sample t-test revealed that the proportion of listening items correct significantly improved from pretest ($M = .71$, $SD = .15$) to post ($M = .93$, $SD = .08$), $t(121) = 16.58$, $p < .001$. The interaction between time and gender on listening was examined via a repeated measures ANOVA. The results revealed a significant main effect for time, $F(1, 120) = 280.94$, $p < .001$, partial $\eta^2 = .701$. Further examination of the results revealed a significant increase in listening for both males ($p < .001$) and females ($p < .001$) individually. Furthermore, there was a significant interaction between time and gender on listening, $F(1, 120) = 4.86$, $p = .029$, partial $\eta^2 = .039$, indicating that the increase for males ($M = .25$, $SD = .15$) was significantly greater than the increase for females ($M = .19$, $SD = .14$). Figure 3 shows the percent of items correct for males and females and also for kindergarten and first grade at pretest and posttest. A repeated measures ANOVA was also conducted to examine the joint effect of time and grade on proportion of listening items correct. Results revealed a significant main effect of time, $F(1, 120) = 276.16$, $p < .001$, partial $\eta^2 = .697$, and grade $F(1, 120) = 10.92$, $p = .001$, partial $\eta^2 = .083$, but no interaction between time and grade. Further exploration of the results showed that the increase for both kindergarteners ($p < .001$) and first graders ($p < .001$) was significant. As may be expected, the listening skills of first graders started significantly higher than kindergarteners (pretest $p = .007$) and remained significantly higher at posttest (posttest $p = .008$).

Figure 3. Percentage of listening items correct by gender and grade at pretest and posttest



The Liink Project findings are a solid first step in providing empirical evidence that multiple recesses and char-

acter development offered throughout a school year provide a solid platform for learning. It is important to note that even though this was a pilot study with a very small sample size, the significant change in off-task behaviors and attentional focus in a four month period of time for these young children should be investigated further in more diverse public school settings with control schools and larger sample sizes.

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2016-17 TAHPERD Operating Budget
Fiscal Year starts June 1, 2016 and ends May 31, 2017

SHAPE America / Southern District Participation

Income	\$ 0
Expenses	\$ 5,453

American Heart – Jump Rope and Hoops for Heart

Income	\$245,000
Expenses	\$ 7,859

Committees

Income	\$ 0
Expenses	\$ 14,985

Convention – Galveston

Income	\$422,870
Expenses	\$197,617

Divisions

Income	\$ 125
Expenses	\$ 13,270

Governance

Income	\$ 0
Expenses	\$ 19,180

Leadership Conference – Granbury

Income	\$ 2,200
Expenses	\$ 10,480

Membership

Income	\$185,885
Expenses	\$ 3,325

Other Organizations

Income	\$ 0
Expenses	\$ 300

Publications

Income	\$ 16,440
Expenses	\$ 10,475

TAHPERD Office (Initial investment in building \$859,000. Current value \$1.3 million)

Income	\$ 52,050
Expenses	\$697,844

Summer Conference

Income	\$114,420
Expenses	\$ 61,332

Workshops

Income	\$ 8,100
Expenses	\$ 4,970

Total Income \$1,047,090

Total Expenses \$1,047,090

The figures below were as of June 1, 2016
TAHPERD Trust (savings/investments) \$1,224,707
Foundation (savings/investments) \$ 129,398

About the Authors

Dr. Deborah J. Rhea, TCU kinesiology professor and Associate Dean in Harris College of Nursing and Health Sciences, is the Founder and Director of the LiiNK Project (Let's inspire innovation 'N kids).

Alex Rivchun has an M.S. in Kinesiology. He currently serves as Project Manager for the Liink Project as well as assisting in the Harris College of Nursing & Health Sciences research office at TCU.

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