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School Recess and Group Classroom Behavior

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What's Known on This Subject

Three small studies have suggested that students without recess may have difficulty concentrating on specific tasks in the classroom, are restless, and may be easily distracted.

What This Study Adds

Our study examined the relationship between school recess and group classroom behavior in a nationally representative sample. This study showed that a break during the school day was associated with better TRCB scores.

ABSTRACT

OBJECTIVES. This study examines the amount of recess that children 8 to 9 years of age receive in the United States and compares the group classroom behavior of children receiving daily recess with that of children not receiving daily recess.

METHODS. This is a secondary analysis of a public-use data set, the Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999, third-grade data set. Children were categorized into 2 levels of recess exposure, that is, none/minimal break (<1 break of 15 minutes/day) or some recess. Some recess was further categorized into 5 levels on the basis of frequency and duration of recess. Child, parent, school, and classroom characteristics of those with and without recess were compared. The group classroom behavior was assessed by using the teacher's rating of class behavior.

RESULTS. Complete data were available for 10 301 to 11 624 children 8 to 9 years of age. There were equal numbers of boys and girls (boys: 50.3%). Children exposed to none/minimal break (30%) were much more likely to be black, to be from families with lower incomes and lower levels of education, to live in large cities, to be from the Northeast or South, and to attend public school, compared with those with recess. Teacher's rating of classroom behavior scores were better for children with some recess than for those with none/minimal break. This finding was maintained in multivariate regression analysis. However, among children receiving daily recess, the teacher's rating of class behavior scores did not differ significantly according to the level of exposure.

CONCLUSIONS. These results indicated that, among 8- to 9-year-old children, having ≥ 1 daily recess period of >15 minutes in length was associated with better teacher's rating of class behavior scores. This study suggests that schoolchildren in this age group should be provided with daily recess. *Pediatrics* 2009;123:431–436

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Key Words

school recess, child behavior, physical activity, play

Abbreviations

ECLS-K—Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999
TRCB—teacher's rating of classroom behavior

NASPE—National Association for Sport and Physical Education

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PLAY IS WIDELY recognized as an important aspect of child development.^{1–3} During free play, children increase their imagination and creativity, organize their own games, develop their own rules, learn problem-solving skills, and practice leadership.^{2,3} A report from the American Academy of Pediatrics states that free unstructured play is healthy and is essential for helping children reach important social, emotional, and cognitive developmental milestones, as well as helping them manage stress and become resilient.¹

Children need free play at home and at school.¹ The time assigned for free play at school is known as recess. Recess is defined as a break during the school day that allows children the time for active free play.^{3,4} A key component of recess is that it is unstructured and undirected.³ On the basis of the literature and as stated by the National Association for Sport and Physical Education (NASPE), school recess should be provided at least once daily, for ≥ 20 minutes.^{5,6} Recess provides children with discretionary time and opportunities to engage in physical activity.^{7–9} Inactivity is a major risk factor for childhood health problems.^{5,7} Active children usually grow up to be active adults.³ The most obvious characteristic of recess is that it constitutes a break from the day's routine.¹⁰ By allowing a mental change and release of energy, recess may have other benefits for classroom behavior; students may be more attentive to academic tasks and less fidgety in the classroom afterward.^{7,11}

Three studies that focused directly on the effects of recess on children's school performance found that, in general, students were better able to focus attention on the teacher and on assigned tasks after recess.^{12–14} In the first study, 23 fourth-graders were observed for 14 weeks, and their attentiveness and fidgetiness before and after recess were documented. Children became more fidgety and less attentive when recess was delayed.¹² The second study showed that students were less attentive before recess than after recess and were more inattentive when recess was delayed

longer.¹³ In the third study, which was conducted in a school that did not have recess, 2 fourth-grade classes were given recess on a random schedule, with attentiveness and fidgetiness being documented before and after recess. The majority of students were more attentive and less fidgety after recess.¹⁴ These results should be interpreted with caution, however, because they are based on limited sample sizes at individual schools. Furthermore, in the 2 studies by Pellegrini et al,^{12,13} the children expected to have recess, and anticipation might have contributed to inattentiveness and fidgeting when recess was delayed.

In the United States, the ways in which recess is defined and implemented vary tremendously,¹⁵ and the data available are somewhat confusing. According to an unpublished survey conducted by the American Association for the Child's Right to Play and cited in many articles, ~40% of public schools have eliminated or are planning to eliminate ≥ 1 recess period from the school day.¹⁶⁻¹⁹ However, a report based on a survey conducted by the National Center for Education Statistics stated that 83% to 88% of children in public elementary schools have recess.²⁰ In that study, the number of recess sessions per day and the duration of the recess periods varied greatly. Furthermore, children were reported to have recess even when the school provided recess only once per week or the recess period lasted <15 minutes. In conclusion, little is known about how many children have recess and how much time is assigned to this activity in the United States. Therefore, this study examined the amount of recess that children 8 to 9 years of age receive in the United States and compared the group classroom behavior of children of the same age receiving daily recess or not receiving recess. We hypothesized that children who received recess would behave better in the classroom as a group, compared with those who did not receive recess.

METHODS

Data Set

Data for these analyses came from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K), third-grade data set, a nationally representative sample.²¹ The ECLS-K is sponsored by the US Department of Education.²¹

The ECLS-K is an ongoing study that focuses on children's longitudinal experiences from kindergarten through middle school.²¹ It is a multisource multimethod study that includes interviews with parents, collection of data from principals and teachers and from student record abstracts, and direct assessments of children.²¹ The children in the ECLS-K are from both public and private schools and from diverse socioeconomic and racial/ethnic backgrounds.²¹ Children and their families, teachers, and schools provide information on the children's home, school, and classroom environments and classroom curriculum.²¹ The ECLS-K third-grade data collection used computer-assisted interviewing for parent interviews and child assessments.²¹ Self-adminis-

TABLE 1 Proportions of Children Receiving Different Amounts of Recess

	Frequency	Daily Recess Periods	Duration, min	Proportion, %
None/minimal break	None or <5 d/wk	Once	<15	30
Some recess				70
Little recess	Daily	Twice or more	1-15	5
More recess	Daily	Twice or more	16-30	18
A lot of recess	Daily	Twice or more	>30	20
Minimal recess/lunch	Daily	Once	16-30	26
Recess/lunch of >30 min	Daily	Once	>30	1

tered questionnaires were used to collect information from teachers and school administrators.²¹

Sample

The third-grade data set contains information on 15 305 children 8 to 9 years of age. The third-grade data were collected in the spring of the 2001-2002 school year, when ~89% of the children interviewed were in third grade, 9% were in second grade, and <1% were in fourth grade or higher. Third-graders who repeated second or third grade, recent immigrants, and children who did not have the chance to be in the sample in kindergarten or first grade were not included.

Measures

Recess Data

The teachers' questionnaire contained 3 questions about recess, with fixed responses. The teachers were asked about the number of days per week children have recess, how many times per day children have recess, and the amount of time the children spend in recess, in 15-minute intervals. Information on the number of days per week of scheduled recess and the length and number of recess periods per day was used to create a new variable to categorize children into 2 levels, that is, none/minimal break versus some recess. None/minimal break was defined as no break during the school day, a break <5 days per week, or a break 5 days per week but only once per day for <15 minutes. Children reported to have some recess were categorized into different levels of exposure. Information about the time assigned to lunch also was obtained from the teachers' questionnaire and was included in this categorization. Some recess was categorized into 5 levels, which are shown in Table 1.

Physical Education Data

Another point of interest was assessing how much physical activity children with no recess were having. Data on the frequency with which children participated in physical education were gathered from the teachers' questionnaire and classified into 4 groups, that is, never/less than once per week, once or twice per week, 3 or 4 times per week, or daily.

Demographic Characteristics

The children's and parents' characteristics were obtained from the parents' questionnaire. The children's characteristics included in the study were gender and ethnicity. Ethnicity was classified as white non-Hispanic, black, Hispanic, or other/mixed. The parents' characteristics included annual household income and parental education. The annual household income was categorized by the ECLS-K. For this study, parental education was classified as less than high school, high school degree or equivalent, some college, bachelor's degree or equivalent, or graduate education.

School Characteristics

The school characteristics were obtained from the school administrators' questionnaire and included location, region, and type of school (private versus public). School location was classified as large/medium-sized city, large/medium-sized town, or small town/rural.

Classroom Characteristics

The classroom characteristics were obtained from the teachers' questionnaire and included number of students in the classroom, classroom academic level, proportion of boys in the class, proportion of students eligible for free lunch, and proportion of minorities in the class. The number of students in the classroom was classified as 10 to 20 students or ≤ 21 students. Classroom academic level was measured by using the proportions of children in the classroom above grade level in reading and math, obtained from the teachers' questionnaire.

Group Classroom Behavior

The main outcome of the study was group classroom behavior, which was assessed by using the teacher's rating of classroom behavior (TRCB), also obtained from the teachers' questionnaire. The teachers were asked to rate the behavior in their class by using a rating scale of 1 to 5: 1, misbehaves very frequently and is almost always difficult to handle; 2, misbehaves frequently and is often difficult to handle; 3, misbehaves occasionally; 4, behaves well; 5, behaves exceptionally well.

Data Analysis

Frequency analyses were used to assess the proportions of children exposed to none/minimal break versus some recess and the proportions of children with some recess in each level of exposure to recess. Frequency analysis also was used to assess the amount of physical education provided in the school to children who were exposed to none/minimal break. The child, parent, and school characteristics of children exposed to none/minimal break were compared with those of children exposed to some recess by using cross-tabulation and χ^2 analyses. TRCB scores were compared for children with and without recess by using an independent *t* test. Because the children's characteristics and school and classroom characteristics might be related to differences in classroom behavior, these factors were entered with recess expo-

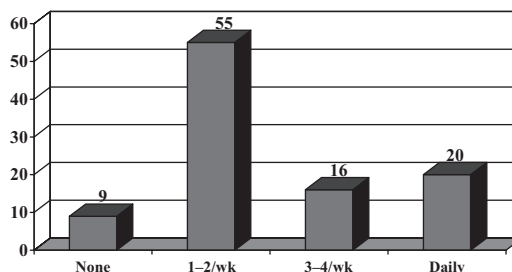


FIGURE 1
Amounts of physical education among children with none/minimal break.

sure into a multivariate regression analysis with TRCB scores as the dependent variable. The characteristics used as control variables were proportion of boys in the class, proportion of students eligible for free lunch, proportion of students above grade in math, proportion of students above grade in reading, number of students in the class, parental education, school location, school region, and school type. Finally, the relationship between TRCB scores and the 5 levels of exposure to recess was examined first by using analysis of variance and then by using multivariate linear regression analysis to adjust for child, parental, and school characteristics as potential confounders, as outlined above. All analyses were performed by using SPSS (SPSS Inc, Chicago, IL).

RESULTS

Depending on the variables analyzed, complete data varied from 10 301 to 11 624 children between the ages of 8 and 9 years. There were equal numbers of boys and girls. There was no significant difference in background characteristics between children who were included in the study and those who were not included because of missing data.

The distribution of exposure to different levels of recess is shown in Table 1. Among children between the ages of 8 and 9 years, 30% were not exposed to recess at all or had a <15-minute daily break. Moreover, among those children, almost 65% had physical education in school twice per week or less (Fig 1).

Table 2 compares the demographic, parental, and school characteristics of the children who had none/minimal break and those who received some recess. As shown, children without recess were significantly more likely to be black or Hispanic ($\chi^2_3 = 824.2$), to live in a large or medium-sized city ($\chi^2_2 = 271.03$), to live in the South ($\chi^2_3 = 1884.13$), and to attend public school ($\chi^2_1 = 278.53$) (all $P < .001$). They also came from families with lower income ($\chi^2_{12} = 288.02$) and less parental education ($\chi^2_4 = 161.36$). In comparison, only 29% of children who received some recess lived in families with annual incomes of less than \$40 000 ($P < .001$). The parents of children who had none/minimal recess were significantly less likely to have a college education or higher (35% vs 42%; $P < .001$). No differences were noted according to gender or class size.

Table 3 shows the results of the bivariate analysis using an independent *t* test to compare the TRCB score

TABLE 2 Comparison of Demographic, Parental, and School Characteristics of Children With None/Minimal Break Versus Some Recess

Characteristics	N	n (%)	
		None/Minimal Break	Some Recess
Ethnicity ^a	11 612		
White non-Hispanic	7093	1647 (48.1)	5446 (66.5)
Black	1380	814 (23.8)	566 (6.9)
Hispanic	1808	688 (20.1)	1120 (13.7)
Other/mixed	1331	276 (8.1)	1055 (12.9)
Gender	11 624		
Male	5866	1712 (49.9)	4154 (50.7)
Female	5758	1717 (50.1)	4041 (49.3)
Parental education ^a	10 301		
Less than high school	710	300 (10.3)	410 (5.5)
High school or equivalent	2610	858 (29.5)	1752 (23.7)
Some college	2949	836 (28.7)	2113 (28.6)
Bachelor's degree or equivalent	2144	519 (17.8)	1625 (22)
Graduate education	1888	398 (13.7)	1490 (20.2)
Parental income ^a	10 301		
Less than \$5000	221	105 (3.6)	116 (1.6)
\$5000-\$10 000	288	126 (4.3)	162 (2.2)
\$10 001-\$15 000	487	196 (6.7)	291 (3.9)
\$15 001-\$20 000	569	226 (7.8)	343 (4.6)
\$20 001-\$25 000	615	229 (7.9)	386 (5.2)
\$25 001-\$30 000	690	233 (8)	457 (6.2)
\$30 001-\$35 000	540	161 (5.5)	379 (5.1)
\$35 001-\$40 000	738	217 (7.5)	521 (7.1)
\$40 001-\$50 000	1155	304 (10.4)	851 (11.5)
\$50 001-\$75 000	2036	511 (17.6)	1525 (20.6)
\$75 001-\$100 000	1471	320 (11)	1151 (15.6)
\$100 001-\$200 000	1149	220 (7.6)	929 (12.6)
More than \$200 001	342	63 (2.2)	279 (3.8)
School location ^a	11 418		
Large/middle-sized city	4057	1498 (44.5)	2559 (31.8)
Large/middle-sized town	4505	1338 (39.7)	3167 (39.3)
Small town/rural	2856	531 (15.8)	2325 (28.9)
School region ^a	11 624		
Northeast	2167	641 (18.7)	1526 (18.6)
Midwest	3255	450 (13.1)	2805 (34.2)
South	3818	2069 (60.3)	1749 (21.3)
West	2384	269 (7.8)	2115 (25.8)
School type ^a	11 619		
Public	9199	3048 (88.9)	6151 (75.1)
Private	2420	381 (11.1)	2039 (24.9)
Class size	11 552		
10-20 students	5462	1582 (46.5)	3880 (47.6)
≥21 students	6090	1820 (53.5)	4270 (52.4)

^a $P < .001$.

means of the 2 groups. As shown, the TRCB scores were better for children in the some recess group than those in none/minimal break group. The same results were ob-

TABLE 3 Bivariate Comparison of TRCB Scores for Children With None/Minimal Break Versus Some Recess

	N	TRCB Score, Mean ± SD
None/minimal break	3369	3.44 ± 0.900
Some recess ^a	8160	3.60 ± 0.854

^a $P < .001$.

TABLE 4 Multivariate Comparison of TRCB Scores for Children With None/Minimal Break Versus Some Recess

	Standardized β (95% Confidence Interval)	P
Some recess	0.042 (0.032-0.129)	.001
Proportion of boys in class	-0.154 (-1.689 to -1.263)	<.001
Proportion of students eligible for free lunch	-0.097 (-0.364 to -0.174)	<.001
Proportion of students above grade in math	0.108 (0.370-0.681)	<.001
Proportion of students above grade in reading	0.045 (0.059-0.361)	.006
No. of students in class	-0.062 (-0.018 to -0.008)	<.001
Proportion of minorities in class	-0.091 (-0.070 to -0.034)	<.001
Parental education	0.031 (0.004-0.040)	.017
Midwest	-0.057 (-0.164 to -0.049)	<.001
South	-0.039 (-0.131 to -0.015)	.014
West	0.025 (-0.011 to 0.123)	.103
Large suburb	0.021 (-0.010 to 0.084)	.121
Small town/rural	-0.076 (-0.205 to -0.096)	<.001
Private school	-0.041 (-0.141 to -0.034)	.001

served in multivariate regression analysis after adjustment for potential confounders (Table 4). Analysis of variance demonstrated a relationship between TRCB scores and the 5 levels of exposure to recess ($F_{5,11\ 523} = 17.55$) (Table 5). Posthoc analyses showed that the groups with each level of recess were significantly different from the none/minimal break group but no significant differences were observed among the groups with different levels of exposure to recess (data available on request). These results did not change in the multivariate regression analysis.

DISCUSSION

A study conducted by the Institute for Social Research at the University of Michigan showed that, since the late 1970s, children have lost 12 hours/week in free time, including a 25% decrease in play and a 50% decrease in unstructured outdoor activities.²² Presently, many schoolchildren are given less free time and fewer physical outlets at school, because many school districts re-

TABLE 5 Bivariate Comparison of TRCB Scores According to Level of Exposure to Recess

Level of Exposure	N	TRCB Score, Mean ± SD (95% Confidence Interval)
None/minimal break	3369	3.44 ± 0.900(3.41-3.47)
Little recess ^a	595	3.62 ± 0.811(3.55-3.68)
More recess ^a	2132	3.57 ± 0.900(3.53-3.60)
A lot of recess ^a	2299	3.61 ± 0.829(3.58-3.64)
Minimal recess/lunch ^a	3027	3.60 ± 0.845(3.57-3.63)
Recess/lunch of >30 min ^a	107	3.74 ± 0.925(3.56-3.92)

^a $P < .001$ for none/minimal break versus all other groups.

sponded to the No Child Left Behind Act of 2001²³ by reducing time committed to recess, the creative arts, and even physical education in an effort to focus on reading and mathematics.^{16,19,22,24–27}

The present study illustrates that this trend especially affects children who come from disadvantaged backgrounds. Children who did not receive scheduled recess at school were more likely to be from lower-income families and from black and Hispanic ethnic groups. This raises concern, in light of evidence that many children from disadvantaged backgrounds are not free to roam their neighborhoods or even their own yards unless they are accompanied by adults.²⁸ For many of these children, recess periods may be the only opportunity for them to practice their social skills with other children.^{10,29}

Childhood health problems caused by inactivity or underactivity represent a growing problem in the United States.⁷ Since the 1970s, the prevalence of obesity among children has more than doubled for children 2 to 5 years of age and adolescents 12 to 19 years of age and has more than tripled for children 6 to 11 years of age.^{30,31} Children spend a large majority of their day in school, during which recess and physical education provide the opportunity for physical activity.^{6,32,33} The NASPE guidelines suggest that children between the ages of 5 and 12 years should have ≥ 60 minutes of physical activity per day, and periods of ≥ 2 hours of inactivity are discouraged.⁶ These data illustrate that, among the 30% of children who had none/minimal break, almost two thirds had minimal physical activity in school. The results of this study suggest that many children between the ages of 8 and 9 years may not meet the NASPE recommendations and are at risk for becoming overweight.

Moreover, recess may be an important element of classroom management and behavior guidance.¹¹ Findings in this study suggest that recess may have a benefit for overall group classroom behavior. Studies by Pellegrini et al^{12,13} and Jarrett et al¹⁴ concluded that students were less attentive and worked less efficiently when confined to their classrooms in continuous instructional time. Those findings support the importance of recess for student attentiveness in the classroom. A change in academic instruction or class topic does not offer a mental change or a physical release.^{1,34} Even a formal, structured, physical education class may not offer the same benefit as recess.^{5,15,35}

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.^{15,36} In most Asian elementary schools, students are given a 10-minute break after every 40 to 50 minutes of instructional time, depending on the grade.^{15,36} In this study, however, the overall group classroom behavior ratings did not differ significantly according to the frequency of or the time assigned for recess, which suggests that group classroom behavior is better among those provided with even 1 daily recess of >15 minutes in length.

Failure to demonstrate any differences among recess groups may be partly a reflection of some of the limitations of this study. First, data were obtained from a data

set in which no definition of recess was provided in the teachers' questionnaires, which allowed teachers to apply different definitions. In this study, adequate recess was defined on the basis of the literature, which suggests that recess should be provided for ≥ 20 minutes.⁵ In this data set, the length of recess was recorded in periods of 15 minutes; therefore, we selected >15 minutes as being closest to the recommended minimal period. Second, information about lunchtime and recess was overlapping in some response categories. Therefore, conclusions could not be drawn regarding the adequacy of these children's recess time. Another limitation was that the analysis was performed according to the number of children, because the data did not provide the information necessary to cluster the number of classrooms. Furthermore, because children's classroom behavior was used to assess the effect of recess on group classroom behavior and not individual classroom behavior, it is not possible to exclude potential bias from the teacher's feelings about recess. Teachers whose classes had recess might feel differently about the behavior of the students in their classrooms, because they also might benefit from this break. In addition, because the data analyzed in this study were only for children between the ages of 8 and 9 years, the findings cannot be generalized to other age groups.

CONCLUSIONS

This study showed that a break during the school day of ≥ 15 minutes was associated with better TRCB scores. In addition, the available research suggests that recess may play an important role in the learning, social development, and health of children in elementary school.¹⁰ However, more research is needed to explore the appropriate balance between structured time and recess/physical activity for healthy child development and to assess the effect of no-recess policies on students' behavior and academic achievements.

A recent report from the American Academy of Pediatrics stated that every child deserves the opportunity to develop to his or her unique potential and that child advocates must consider all factors that interfere with optimal development and should press for circumstances that allow each child to gain the full advantages associated with play.¹ Pediatricians have a unique and important opportunity to promote free play as an essential part of childhood, emphasizing that play is necessary for healthy development and optimal brain development.¹ Pediatricians who serve as advisors in their communities can advocate free play in school and in after-school programs and can advise parents to learn about recess and physical activity provided by the school before they select a school program for their child.

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REFERENCES

- Ginsburg KR; American Academy of Pediatrics, Committee on Communications and Committee on Psychosocial Aspects of Child and Family Health. The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics*. 2007;119(1):182-191
- Bergen D. *Play as a Medium for Learning and Development: A Handbook of Theory and Practice*. Portsmouth, NH: Heinemann; 1998
- Waite-Stupainsky S, Findlay M. The fourth R: recess and its link to learning. *Educ Forum*. 2001;66(1):16-24
- Pellegrini AD, Smith PK. School recess: implications for education and development. *Rev Educ Res*. 1993;63(1):51-67
- National Association for Sport and Physical Education. *Recess in Elementary Schools: A Position Paper of the Council on Physical Education for Children and the National Association for Sports and Physical Education*. Reston, VA: National Association for Sport and Physical Education; 2001
- National Association for Sport and Physical Education. *Physical Activity for Children: A Statement of Guidelines for Children Ages 5-12*. 2nd ed. Reston, VA: National Association for Sport and Physical Education; 2004
- National Association of Early Childhood Specialists in State Departments of Education. *Recess and the Importance of Play: A Position Statement on Young Children and Recess*. Urbana, IL: National Association of Early Childhood Specialists in State Departments of Education; 2002
- Hernandez Y. Recess provides cognitive, social and psychomotor opportunities for growth. *IDRA Newsl*. 2001;April: www.idra.org/IDRA_Newsletter/April_2001_Self_Renewing_Schools_Early_Childhood/. Accessed February 17, 2005
- Clements RL, ed. *Elementary School Recess: Selected Readings, Games, and Activities for Teachers and Parents*. Boston, MA: American Press; 2000
- Jarrett OS. Recess in elementary school: what does the research say? *ERIC Digest*. 2003-2. Available at: www.ericdigests.org/recess.html. Accessed January 18, 2005
- Bogden JF, Vega-Matos CA. *Fit, Healthy, and Ready to Learn: A School Health Policy Guide, Part I: Physical Activity, Healthy Eating, and Tobacco-Use Prevention*. Alexandria, VA: National Association of State Boards of Education; 2000
- Pellegrini AD, Davis P. Relations between children's playground and classroom behavior. *Br J Educ Psychol*. 1993;63(1):88-95
- Pellegrini AD, Huberty PD, Jones I. The effects of recess timing on children's playground and classroom behaviors. *Am Educ Res J*. 1995;32(4):845-864
- Jarrett OS, Maxwell DM, Dickerson C, et al. The impact of recess on classroom behavior: group effects and individual differences. *J Educ Res*. 1998;92(2):121-126
- Pellegrini AD, Bohn CM. The role of recess in children's cognitive performance and school adjustment. *Educ Res*. 2005;34(1):13-19
- Klein G. Recess in jeopardy? Media General News Service. *Washington Dateline*. March 21, 2006. Available at: http://washdateline.magnetnetwork.com/index.cfm?SiteID=wsh&PackageID=46&fuseaction=article.main&ArticleID=8086&GroupID=214. Accessed December 15, 2007
- Recess is "in recess" as schools cut child's play. *Educ Rep*. 2001;189 Available at: www.eagleforum.org/educate/2001/oct01/recess.shtml. Accessed April 17, 2006
- MacPherson K. Development experts say children suffer due to lack of unstructured fun. *Pittsburgh Post-Gazette*. October 1 2002; Available at www.postgazette.com/lifestyle/20021001childisplay1001fnp3.asp. Accessed April 17, 2006
- Bland K. Schools pressured to cut recess: instructional needs mean less time for kids to play. *Arizona Republic*. May 12 2005; Available at: www.azcentral.com/families/education/articles/0512recess12.html. Accessed September 5, 2006
- National Center for Education Statistics. *Calories In, Calories Out: Food and Exercise in Public Elementary Schools, 2005*. Washington, DC: US Department of Education; 2006. NCES 2006-057. Available at: www.nces.ed.gov/pubs2006/2006057.pdf. Accessed June 14, 2006
- National Center for Education Statistics. *Early Childhood Longitudinal Study Kindergarten Third Grade Public-Use Data File and Electronic Code Book: User's Manual for the ECLS-K Third Grade Public-Use Data Set*. Washington, DC: National Center for Education Statistics; 2004
- Juster TF, Stafford F, Ono H. *Major Changes Have Taken Place in How Children and Teens Spend Their Time: Child Development Supplement*. Ann Arbor, MI: Institute for Social Research, University of Michigan; 2004. Available at: www.umich.edu/news/index.html?Releases/2004/Nov04/r11704a. Accessed May 7, 2007
- Department of Education. *The No Child Left Behind Act of 2001: Executive Summary*. Washington, DC: Department of Education; 2002. Available at: www.ed.gov/nclb/overview/intro/execsumm.pdf. Accessed January 18, 2005
- Dillon S. Schools cut back subjects to push reading and math. *New York Times*. March 26, 2006; Available at: www.nytimes.com/2006/03/26/education/26child.html. Accessed July 20, 2007
- National PTA. Recess is at risk, 2006. Available at: www.pta.org/ne_press_release_detail_1142028998890.html. Accessed July 20, 2007
- Kirn W, Cole W. Whatever happened to play? *Time*. April 22, 2001; www.time.com/time/nation/article/0,8599,10726,400.html. Accessed April 13, 2006
- Ohanian S. *What Happened to Recess and Why Are Our Children Struggling in Kindergarten?* New York, NY: McGraw-Hill; 2002
- White R, Stoeklin V. Children's outdoor play and learning environments: returning to nature. Kansas City, MO: White Hutchinson Leisure and Learning Group. Available at: www.whitehutchinson.com/cgibin/printer.cgi?p=/children/articles/outdoor.shtml. Accessed July 20, 2007
- Clements R, Jarrett O. Elementary school recess: then and now. *Streamlined Semin*. 2000;18(4):1-4
- Center for Health and Health Care in Schools. *Childhood Overweight: What the Research Tells Us*. Washington, DC: George Washington University; 2005. Available at: www.healthinschools.org/News%20Room/Fact%20Sheets/ChildhoodObesity.aspx. Accessed May 7, 2007
- Ogden CL, Flegal KM, Carroll MD, et al. Prevalence and trends in overweight among US children and adolescents, 1999-2000. *JAMA*. 2002;288(14):1728-1732
- Sidelar R. *Recess: Is It Needed in the 21st Century?* Champaign, IL: Clearinghouse on Early Education and Parenting; 2004. Available at: http://ceep.crc.uiuc.edu/poptopics/recess.html. Accessed January 18, 2005
- Dale D, Corbin CB, Dale KS. Restricting opportunities to be active during school time: do children compensate by increasing physical activity levels after school? *Res Q Exerc Sport*. 2000;71(3):240-248
- Toppino TC, Kasserman JE, Mracek WA. The effect of spacing repetitions on the recognition memory of young children and adults. *J Exp Child Psychol*. 1991;51(1):123-138
- Jarret O, Maxwell D. Physical education and recess: are both necessary? Available at: www.southfayette.org/~bohn/recess.html. Accessed January 18, 2005
- Stevenson HW. Learning from Asian schools. A review and commentary by Paul MacFarlane, written in November 1999. *Sci Am*. 1992; Available at: www.tdl.com/~schafer/Asian.htm. Accessed October 31, 2007

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