The Role of Recess in Children's Cognitive Performance and School Adjustment

by Anthony D. Pellegrini and Catherine M. Bohn

The authors suggest that the recess period serves a positive purpose in the primary school curriculum, counter to the current practice of minimizing recess in many schools across North America and the United Kingdom. The authors' position is embedded in the larger debate about school accountability; they argue that school policy should be based on the best theory and empirical evidence available. They support their argument for the importance of recess with theory and with experimental and longitudinal data showing how recess breaks maximize children's cognitive performance and adjustment to school.

The emphasis on accountability in both preschool and primary school education has increased over the past 40 years, the legislation associated with the No Child Left Behind Act of 2001 being perhaps the most visible and recent example. Advocates of accountability suggest—and rightly, we think—that educational practice should be based on empirical evidence and that the scarce tax dollars we have should be spent on those programs that "work." To that end, the U.S. Department of Education's Institute of Education Sciences has recently announced a grant competition to evaluate educational programs that have been shown to be effective (U.S. Department of Education, 2004).

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The orientation toward accountability has a number of implications. Perhaps most broadly, schools are organizing schedules so that instructional time is maximized and noninstructional time, such as recess, is minimized. This practice may follow from the assumption that minimizing recess affords more opportunities for instruction, which should, therefore, maximize performance. One of the specific, though less discussed, implications of this stance in the educational research literature (Pellegrini & Smith, 1993; Jarrett & Maxwell, 2000) is the current practice across North America and the United Kingdom of minimizing or eliminating children's opportunities for recess breaks during the school day and their corresponding opportunities to interact with their peers. This issue has been studied (e.g., Blatchford, 1998; Jambor, 1999), but there are gaps in the educational literature, and those gaps have not escaped the attention of the American and British print media (e.g., *The Economist*, 2001).

Recess in the School Curriculum

The trend toward diminished recess time has been corroborated by at least three surveys. A national survey taken by the National Association of Elementary School Principals in 1989 found that 96% of the surveyed school systems had one or two recess periods per day (Pellegrini, 2005). Another national survey, conducted 10 years later, found that only 70% of the kindergarten classrooms that were sampled had a recess period (Pellegrini, 2005). Although these surveys indicate a decline with time, we should be cautious in interpreting the trend, as the surveys were not exactly comparable (e.g., they sampled different units and asked different questions), and the details of the methodology are not readily transparent.

However, a similar trend was observed in a much more rigorously conducted survey in England (Blatchford & Sumpner, 1998). That survey's nationally representative random sample of primary and secondary schools (1 in 10 of such schools in the country) found uniform erosion of recess time across a 5-year period (1990/1991–1995/1996). Declines in recess periods were reported in both primary schools (56%) and secondary schools (44%).

It is important to note that recess, or *breaktime,* as it is called in the United Kingdom, is rather uniformly implemented there (Blatchford & Sumpner, 1998); in the United States there is no such uniformity (Pellegrini & Smith, 1993). In the United Kingdom, schools have morning, lunch (called "dinner"), and afternoon breaks. Although British students across all grades have breaks, the duration of the break periods decreases with age: 93 minutes for children in infant school (5 to 7 years of age), 83 minutes for junior school (7–11 years of age), and 77 minutes for secondary school students (11–16 years of age).

In the United States, the ways that recess is defined and implemented vary tremendously. Generally, individual schools determine policy for recess. In fact, in 87% of the schools that reported having recess, different practices were observed within the same district (Pellegrini, 2005). In many cases, teachers *within the same school* varied the time and duration of the recess period; for example, in some cases it was 10 minutes, in others 20 minutes (Pellegrini, 2005). Furthermore, from the data available, we do not know the form that the recess periods took (e.g., we do not know if organized physical education was counted as recess).

In short, whatever form recess takes, opportunities for recess are being minimized. The momentum from this trend may be

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due to the fact that politicians and school superintendents see this as a way in which to "get tough on education." Indeed, it has been presented as commonsensical that reducing recess time has a positive effect on achievement, as argued by Benjamin Canada, the former superintendent in Atlanta, without empirical evidence to support the claim ("No Time for Play," 2001).

Many educators recognize the centrality of maximizing the efficient use of relatively scarce classroom time; many also advocate for the role of breaks between periods of intense work where children can relax and interact with peers, with the hope that they will return to their classrooms after their breaks to work with renewed interest (e.g., National Association of Early Childhood Specialists in State Departments of Education, 2001; Toppino, Kasserman, & Mracek, 1991). We argue for common ground between the two positions, with particular reference to primary schools. Most basically, we agree with the need for accountability, meaning that educational practice and policy should be based on the best available theory and empirical evidence. Furthermore, educators have an obligation to present evidence in support of their policies. To do otherwise is to squander the trust and resources of children, families, and taxpayers. From this view, we present both theory (the cognitive immaturity hypothesis) and data to support the argument that what goes on during the recess period is educational in the traditional sense (i.e., it affects attention to classroom lessons, achievement test performance, and adjustment to school).

Recess as Educational: The Cognitive Immaturity Hypothesis

One of the primary goals of schooling is teaching children skills and strategies associated with literacy, mathematics, and science—each of which is typically measured by some form of standardized achievement test. We use the term "cognitive performance" as an umbrella term to cover the skills and strategies associated with school-based learning. Correspondingly, positive social and emotional development is crucial to successful cognitive performance and adjustment to school (Coie & Dodge, 1998).

Theoretically, our view of recess in the school curriculum is framed by the cognitive immaturity hypothesis (e.g., Bjorklund & Green, 1992). Traditional views of children's cognitive processing (e.g., Piaget, 1983) suggest that young children's cognition is an imperfect version of more mature adult processes. For example, young children's tendencies to make unrealistic estimates of their own capabilities by overestimating their own cognitive (Yussen & Levy, 1975) and social status (Smith & Boulton, 1990) has been framed as a limitation—something to be overcome. The cognitive immaturity hypothesis suggests that these processes are not inferior variants of adult behavior but, instead, specific adaptations to the niche of childhood that enable young children to effectively learn skills and behavior. For example, children's overestimation of their own cognitive and social skills enables them to persevere at tasks even though, by adult standards, they are not doing them very well. This perseverance may lead to self-perceived success, which may, in turn, lead to higher self-perceived competence and help the child in learning complicated skills and strategies (Bandura, 1997).

With specific reference to the role of recess, this position holds that *playful*, not structured, breaks may be especially important in maximizing performance because unstructured breaks may reduce the cognitive interference associated with immediately preceding instruction (e.g., Bjorklund & Harnishfeger, 1990). The immaturity of their nervous systems and their lack of experience render children unable to perform higher-level cognitive tasks with the same efficiency as older children and adults and directly influences their educability. From this logic, it follows that young children are especially susceptible to the effects of cognitive interference after sustained periods of structured work (see Dempster, 1992). Breaks during periods of sustained cognitive work should reduce cognitive interference and maximize learning and achievement gains (Toppino et al., 1991).

Although one might predict that changing from one type of focused activity to another would yield some cognitive benefit, children (especially young children) may experience a continued buildup of interference with repeated performance of highly-focused tasks, even if the tasks are different, and thus experience greater benefit from a drastic change in activity, such as is afforded by unstructured recess. This is consistent with the evidence that younger children may require a greater change in activity or stimulus materials before they experience a release from interference (e.g., Bjorklund, 1978). It is important to note that instructional regimens, such as physical education, would not serve the same purpose (Council on Physical Education for Children, 2001).

The cognitive immaturity hypothesis also attributes special importance to the role of peer play during the early primary grades (Bjorklund & Pellegrini, 2000). From this point of view, play is not an imperfect version of adult behavior but, rather, serves an important role in childhood (Bateson, in press). When children engage in social play with their peers, for example, they are often enacting roles and behavior that are, at some level, not attainable in real life (Fein, 1979; Vygotsky, 1967). For example, when boys engage in forms of play fighting, they take turns being the superhero. This is often accomplished through "self-handicapping" and reciprocal role taking, in which a bigger or stronger boy allows his peer to assume a dominant role. Children's social skills increase in correspondence with the frequency with which they enact different and varied social roles (Pellegrini & Smith, 1998). For example, the sort of behavioral flexibility just described is necessary for sustained peer interaction. In the process of these interactions, individuals learn to take other children's perspectives, comprehend and produce social signals, and inhibit their aggression.

The social exchanges between peers that typify most recess periods are especially important to primary school children's cognitive performance and more general adjustment to school. The skills and self perceived competence associated with successful peer relations are related to children's school success (Coie & Dodge, 1998), and more general social competence (Waters & Sroufe, 1983) may be due to a number of processes. For example, the social-cognitive demands associated with peer interactions, such as perspective taking and using explicit language, relate to more general cognitive performance (Piaget, 1983) and classroom achievement (Bjorklund & Pellegrini, 2000). Furthermore, the social-emotional support provided by close peer relations, such as friendships, helps young children adjust to the stresses of early schooling (Boyle, Marshall, & Robeson, 2003; Ladd, Kochenderfer, & Coleman, 1996).

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The Role of Recess in Cognitive Performance: Proximal Measures

Anecdotal evidence from East Asia (Stevenson & Lee, 1990) suggests that children's attention to class work is maximized when instructional periods are relatively short and followed by breaks. In most East Asian primary schools, for example, children are given a 10-minute break every 40 minutes or so (Lila School, 2004); in middle school they receive a 10-minute break every 45 minutes (Lila School, 2004, http://www.had.ms.kr/doam201_4.html), and in high school a 10-minute break every 50 minutes (Cyber School, 2004). When children come back from these breaks, they seem more attentive and ready to work than before the breaks. As illustrated below, American experimental evidence (Jarrett et al., 1998; Pellegrini & Smith, 1993; Pellegrini, Huberty, & Jones, 1995; Ridgway, Northup, Pellegrini, LaRue, & Hightshoe, 2003) supports these claims.

Attention to classroom tasks has been used in many studies of proximal effects of recess on cognitive performance (e.g., Jarrett et al., 1998; Ridgway et al., 2003). Attention is a direct and relatively easy-to-measure index of children's motivation for, and engagement in, their school work (e.g., Toppino et al., 1991). Attention to classroom tasks, such as reading, in turn, is also related to more general and distal indicators of cognitive performance, such as reading achievement (e.g., Rowe & Rowe, 1992).

To illustrate the role of recess on attention, we highlight the findings from a series of field experiments conducted in a public elementary school (Pellegrini & Smith, 1993; Pellegrini et al., 1995). Procedurally, in all of these experiments we experimentally manipulated recess timing, or the time children spent doing seatwork before recess. On randomly assigned days, they went out to recess at 10 a.m. (the shorter timing period) or at 10:30 a.m. (the longer timing period). Before and after recess, children's attention to classroom tasks was coded. In three of the four experiments (Pellegrini et al., 1995), we also experimentally controlled the tasks on which children worked before and after recess: Male- or female-preferred books were read to the children in counterbalanced order.

The results indicated in all experiments that children were more attentive after than before recess. Furthermore, children were less attentive during the longer recess-timing period than in the shorter period. These results clearly supported Stevenson and Lee's (1990) supposition that children are less attentive during long work periods. Furthermore, in many cases, gender moderated the effects of recess. Children were more attentive to the same-gender books than to the other-gender books, consistent with the literature on gender preference for stories (Monson & Sebesta, 1991). And boys' attention was especially sensitive to recess timing: Boys were more likely than girls to be inattentive in the longer recess-timing condition.

In one of our experiments the recess period was held indoors (Pellegrini et al., 1995, Experiment 3). We chose that venue because examining the effects of indoor recess on children's attention would provide insight into the role of a relatively sedentary break period on subsequent attention. By implication, the results should also evaluate the "blowing off steam" hypothesis. If children's attention were greater after than before the indoor break, the role of physical activity per se would be minimal. This is relevant to policy, as educators sometimes use indoor recess as an alternative to outdoor breaks. The results from this experiment replicated the findings from the outdoor recess results: Children were more attentive after recess than before.

In short, these experiments support the idea that providing breaks over the course of instruction facilitates children's attention to classroom tasks; physical activity did not seem to play an important role. That these results were obtained through well-controlled field experiments and replication across a number of studies instills confidence in the findings.

The Role of Peer Interaction at Recess in Predicting First-Grade Achievement

Next, we explore the relations between the peer interactions typical of children's recess behavior and traditional measures of school achievement. We were guided in this area by the notion that the competence used in social interaction with peers is related to skills and strategies tapped by more traditional measures of achievement. Most broadly, we observed adult-directed behavior (e.g., standing next to, talking with) and peer-directed behavior (e.g., ball games, joint playing with objects) and related them to measures of achievement. A number of studies have demonstrated that, when given free choice in an unstructured environment, children who choose to interact with peers more than with adults are more sophisticated on specific social-cognitive measures (e.g., less antisocial, more popular with peers, better at perspective taking, higher-achieving academically) (e.g., Harper & Huie, 1985). These findings are consistent with Piagetian (1983) theory suggesting that the disequilibration characteristic of peer interaction facilitates development, whereas the typically unilateral interactions characteristic of adult-child interaction are less facilitative. That is, children are more likely to disagree with each other than they are to disagree with adults. When peers disagree, they are confronted with points of view other than their own and, if they want interaction to continue, they must accommodate to their peers' points of view. These sorts of social interaction often occur on playgrounds at recess.

Our stress on the importance of peers, relative to adults, in a play context does not minimize the more general importance of positive teacher-student relationships in school (e.g., Davis, 2003) or the more general importance of adult-child relationships in children's social development (Sroufe et al., 1999). Indeed, we recognize the importance of the continuity in children's peer relationships from adult-child relationships (Sroufe et al., 1999). Our position is that primary school children should be applying the earlier competence developed with adults into the newer context of peer relations. Unstructured peer interaction affords opportunities to learn and develop new social and cognitive skills.

Correspondingly, placing children in such highly motivating but demanding situations (such as recess) is also important from an assessment perspective. It may be that the often-described difference between children's competence as measured in standardized testing situations and their competence as measured in playful situations (Cazden, 1975; Waters & Sroufe, 1983; Vygotsky, 1967) is due to different levels of motivation to exhibit competence. In testing situations, youngsters may see little reason to achieve, whereas in the more playful situation children typically enjoy interacting with peers and thus are motivated to do the difficult social cognitive work necessary to sustain peer interaction.

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Our intent in this section is to show that standardized achievement and aptitude measures, although important, have limited explanatory and predictive power, especially for young children (e.g., Davis, 2003; Wentzel, 1991). Instead, and like Ziegler and Trickett (1978), we suggest that children's social competence with peers is a powerful and complementary predictor of school performance and adjustment. These analyses, hopefully, will inform legislators and state and federal departments of education about a different view of children and different ways of assessing them.

The 2-year longitudinal study presented in this section was conducted in a public elementary school catering to a wide variety of children (Pellegrini, 1992). Children's social interactions with peers and adults were observed extensively across 2 years on the school playground at recess. The Metropolitan Readiness Test (MRT, Nurss & McGauvran, 1976) was used to assess the early reading and math concepts of the kindergarten children. The measure of academic achievement for first graders was the Georgia Criterion–Referenced Competency Test (CRCT), also a test of general knowledge and early literacy and numeracy concepts.

We demonstrated that kindergarteners' playground social behavior was a significant predictor of their first-grade academic achievement, even after taking their kindergarten achievement into consideration ($R^2 = .75$ for the whole model). Peer interaction was positively related to achievement; adult-directed behavior was negatively related to achievement. These results, importantly, showed that kindergarten MRT status did indeed predict first-grade academic achievement ($R^2 = .34$). However, and most important for our discussion of the value of recess, the children's behavior at recess accounted for significant and unique variance in first-grade achievement, even with kindergarten achievement held constant ($R^2 = .41$). Again, this finding supports criticisms that standardized measures of children's cognition have limited predictive value (e.g., Ziegler & Trickett, 1978). Substantially more variance in first-grade achievement is accounted for when children's behavior in a naturalistic and motivating environment is considered. Correspondingly, and as Cronbach (1971) suggested more than 30 years ago, validity—in this case, predictive validity—increases when we use more than one measure. This clearly speaks against the current common practice of using only one measure to make inferences about children's performance. On the other hand, kindergarten children's test performance should not be totally disregarded; it accounted for a statistically significant portion of the variance in children's first-grade achievement. Thus "throwing the baby out with the bath water" would limit our understanding of a very complex phenomenon: school achievement.

Certainly more research is needed to document the differential roles of peers and adults in young children's social and cognitive development. For example, in free-play situations, adults generally inhibit older preschool children's exhibition of complex forms of play, whereas peers facilitate it (e.g., Dickinson & Moreton, 1994). However, in a small-group teaching context, such as planning an errand or a classification task, adults are much more effective than peers as tutors (Tudge & Rogoff, 1989). Furthermore, these findings do not discount the importance of positive teacher-child relationships (Davis, 2003). For example, attachment theorists have argued that the attachment relationship between mother and child provides the base from which children establish peer and adult relationships (Sroufe et al., 1999).

Peer Interaction as the Fourth "R"

Another dimension of our argument relates more specifically to the importance of peer interaction for primary school children's adjustment to school. In the preceding study, the reported observations of playground behavior were admittedly global. They told us only about the relative value of peer and adult interaction.

The province of British Columbia has recently recognized the importance of peer interaction to children's school adjustment by labeling social responsibility a "foundational skill" in schools, equivalent to a fourth "R" (British Columbia Performance Standards, 2000; we acknowledge Shelley Hymel, at the University of British Columbia, for this information). The abilities to interact cooperatively with peers, inhibit antisocial behavior, and form close relationships, such as friendships, are important developmental tasks for children as they first enter primary school (Waters & Sroufe, 1981). Successful mastery of those tasks constitutes "social competence" for that period, and they, in turn, provide the foundation for subsequent skill development and school success (Waters & Sroufe, 1983). From this point of view, mastering the skills necessary for membership in the school peer group and feeling competent in that area should provide a basis for the successful interactions with peers and teachers that are necessary for adjustment to school.

Numerous longitudinal studies have documented the importance of children's peer relations in their initial adjustment to elementary school. For example, Ladd and colleagues (Ladd et al., 1996; Ladd, Price, & Hart, 1988) have shown that successful transition from preschool to primary school is fostered when children make the transition with a friend. Friends provide important social-emotional support for each other in the new and stressful environment of primary school.

Relationships with peers and social skills often develop in the context of social games with peers, such as tag, soccer, and jump-rope games. As Piaget (1962) argued, games are a modal form of interaction for primary school–age children. Our longitudinal research (Pellegrini, Kato, Blatchford, & Baines, 2002) has documented empirically the importance of games for children, and especially boys, in entering and adjusting to the first mandatory year of primary school. In this work, inner-city Minneapolis first graders (in two schools) were observed on their playgrounds at recess and assessed on varying aspects of social competence and adjustment to school. We found that children, but especially boys, used their facility with games (ball games, chase, and jumping or singing games) as a way to achieve and maintain social competence with their peers and adjust to very early schooling (as assessed by self-report and teacher ratings). Game facility was measured by aggregating teacher ratings, peer nominations, and observations of time spent in games and levels of game sophistication. Game facility predicted unique and significant variance in children's end-of-year social competence (measured by teacher rating scales and peer nominations of popularity), beyond that predicted by beginning-of-year social competence ($R^2 = .56$). Similarly, game facility predicted unique and significant variance in end-of-

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the-year adjustment, beyond beginning-of-year adjustment ($R^2 = .14$). These findings are consistent with results showing the reciprocal effects of peer relations and success in early schooling (Coie & Dodge, 1998).

These results also extend earlier work on peer relationships and adjustment to school (e.g., Ladd et al., 1988) to the extent that the majority of the students in our study were low-income children; 75% of our children were on free or reduced-price lunch, and Spanish was the first language for 40% of the children. It is well known that children, and especially boys, from economically disadvantaged groups have difficulty adjusting to and succeeding in school (e.g., Heath, 1983). We demonstrated that their success in one part of the first-grade school day (games at recess) could predict more general school adjustment.

Future research should examine the extent to which aspects of game facility, such as peer leadership in games, predicts school adjustment in later grades, when the niches of the playground and the classroom are less isomorphic (i.e., solitary academic work replaces more socially interactive instructional modes).

Conclusion: Policy Implications

The experimental and longitudinal data presented in this article, grounded in developmental theory, provide strong support for the role of recess in the primary school curriculum. In terms of specific classroom performance, our work supports the anecdotal evidence from Asian schools, where children are given frequent breaks across the school day. These data also align with the cognitive immaturity hypothesis. Unstructured breaks from demanding cognitive tasks seem to facilitate school learning, as well as more general social competence and adjustment to school.

The evidence presented also implicated the gender preference of classroom tasks in children's attention to those tasks. Gender preference is clearly an important moderator of performance for educators to consider as they make inferences about classifying children, especially in terms of learning disabilities (Pellegrini & Horvat, 1995). For example, most children with attention-deficit hyperactivity disorder (ADHD) are boys, and they are especially vulnerable to the deleterious effects of prolonged periods of concentrated work without a break (Ridway et al., 2003). Under less structured regimens, some of the same boys may not be diagnosed as ADHD.

In conclusion, the research presented in this article attempted to contextualize the recess period within a larger policy debate on the uses of instructional time and school performance. Schools' policy on recess should be evaluated in light of the data presented here. It is common for schools and politicians to extol Asian educational practices; they should also consider Asian recess practices in the context of an extended school day and school year. For example, extending the American school day and school year, with more frequent recess periods, might positively affect children's cognitive performance and social competence, while simultaneously providing parents with badly needed child care for more extended periods.

The finding that children's social competence develops in the context of interacting with their peers is especially important in light of the fact that children are rapidly losing opportunities to interact with peers. There are signs in both the United States and the United Kingdom that children of primary school age have fewer opportunities out of school for interacting freely with peers and, thus, developing social skills and competence (Blatchford, 1998). For example, many American children enter empty homes after school, waiting for their parent(s) to return from work (Steinberg, 1986). With the trends in both the US (Pellegrini, 2005) and in the UK (Blatchford, 1998; Blatchford & Sumpner, 1998) for limiting recess time, we may be losing one of the few times during the day when children have the opportunity to interact with peers and develop social skills.

Finally, the value of recess for children's physical health, although beyond the scope of this article, is also worth considering. American children are overweight (DeAngelis, 2004; Rich, 2004). Indeed, the problem of childhood obesity has been called an epidemic. That state of affairs is the result of a combination of factors, including bad diet and lack of exercise. Children are especially sedentary during the typical school day (Simons-Morton, O'Hara, Parcel, Huang, Baranowski, & Wilson, 1990). Opportunities for recess in spacious settings equipped with apparatus to encourage exercise—basketball hoops, four-square grids, balls, and so forth (Boyle et al., 2003)—would help to moderate children's weight problems. It would especially help if recess were paired with participation-oriented sport (in contrast to sports where only the "best make the team"). It may be that merely providing opportunities for children to engage in free play could lessen the ill effects of their sedentary life in school.

NOTE

This work was supported, in part, by the Spencer Foundation and the Center for Early Education and Development at the University of Minnesota. We also acknowledge the comments of P. A. Schutz, S. L. Lanehart, and anonymous reviewers, as well as numerous conversations on the topic with D. Bjorklund, P. Blatchford, and P. K. Smith.

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Manuscript received July 9, 2004
Revisions received November 13, 2004
Accepted November 22, 2004

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