
Active Play

Exploring the Influences on Children's School Playground Activities



BRENDON HYNDMAN

AMANDA BENSON

AMANDA TELFORD

Because children spend so much of their time in schools, their playgrounds offer a good setting for promoting active play in young lives. Teachers, instead of considering active play a taxing demand on their busy day, have begun to develop an informal curriculum for it. The authors review the research on children's active play and explores its influence on school playgrounds, looking at studies of individual and social play, the effect of physical environments on active play, and the impact of school policies on children's active play on school playgrounds. They ask others to consider the implications of this research when planning children's active play. **Key words:** active play, playground interventions, school playgrounds, socio-ecological model; influences on unstructured play

Introduction

MOST PLAY SCHOLARS consider active play as the diverse range of unstructured, spontaneous physical activities and behavior in which children engage (Pellegrini 2009). Active play can become an informal curriculum for schools (Hyndman et al. 2012), one which facilitates children's learning and development. The importance of such play has been acknowledged by the United Nations High Commission for Human Rights as a basic entitlement for every child (United Nations 1989). Research suggests active play improves classroom behavior (Ridgers, Stratton, and Fairclough 2006), helps develop social and physical skills (Pellegrini and Bohn 2005), and promotes psychological well-being by fostering intrinsic motivation, competence, and a sense of belonging. Although childhood offers important opportunities to establish active play habits, we have only a limited understanding of how to develop and sustain active play among children (Hyndman et al. 2012).

Schools afford the best chance to enhance children's active play (Dobbins et al. 2009; Kriemler et al. 2011). Children spend most of their weekdays (more than thirty hours a week) in schools, making them an obvious and suitable setting for active play. Schools provide an opportunity for active play to children who may have limited time for play at home or in their community. But often busy teachers do not have the time to nurture physical activity, and school playgrounds have emerged as a critical setting for children's active play (Engelen et al. 2013; Hyndman, Benson, and Telford 2014; Hyndman 2015). Most scholars consider active play to be unstructured and to consist of activities in which children participate spontaneously and without purpose (Sener et al. 2008). These can include digging, raking (Salmon et al. 2003); lifting and carrying, exploring, planting, chasing (Dyment and Bell 2008); and pushing objects into positions. They involve construction, imagination, and creativity (Bundy et al. 2009).

In contrast, structured play is organized and characterized by specified locations, time schedules, and adult supervision (Sener et al. 2008). This play includes team sports, racquet sports, and fitness classes (Salmon et al. 2003). Children in elementary schools in Western countries—who attend in general at least three classes a day, five days a week, thirty-nine weeks a year, for seven years—engage in active play on school playgrounds during more than four thousand school breaks, including morning and lunchtime recesses. (In countries, however, such as Hungary in Europe or Taiwan in Asia, school breaks occur less frequently [Ridgers et al 2009; Pan 2008].) Active play on school playgrounds makes up to 50 percent of children's recommended daily physical activity (Tudor-Locke et al. 2006).

School playgrounds give children the chance to build active, healthy bodies and to develop their decision-making, negotiating, and motor skills (Hyndman, Benson, and Telford 2014). Becoming more aware of the facilities for and barriers to children's active play seems vital for effective school playground interventions that encourage and sustain these developmental benefits (Kriemler et al. 2011). In addition, active play helps children hone their social and cognitive skills through the informal curriculum of school playground activities (e.g., the unwritten, unofficial, and often unintended lessons, values, and perspectives that students learn) (Pellegrini and Holmes 2006; Hyndman et al. 2012).

The Social-Ecological Model

Children's active play is complex. Therefore, the social-ecological model exploring

the multiple levels of influence provides a useful framework for understanding it (Salmon and King 2010). However, only a few studies have used this model to investigate the active play of school children and adolescents' active play on school playgrounds (Hyndman et al. 2012). Social-ecological models suggest that to understand active play we need to consider the interaction among the intrapersonal (individual), the interpersonal (social), the physical environment, and organizations and their policies (Salmon and King 2010). In doing so, the social-ecological model offers a comprehensive approach for designing, implementing, and evaluating interventions to influence children's active play on school playgrounds.

Until recently, the available research did not investigate the context in which healthy behavior occurs. Instead it focussed on individual influences on active play (Stevenson and Burke 1992; Stokols 1996). This broader look at healthy behavior may be linked to the social-ecological model of human behavior itself, which emphasizes the need for a "person-environment" fit (Stokols 1996), implying that there is indeed an association among the intrapersonal, the interpersonal, the physical environment, and organization policy. Many healthy behavior models do not show the interactions among these factors and can miss vitally important influences on children's active play. Knowledge of such factors are important to guide school playground interventions that encourage active play (Salmon and King 2010). Such interventions involve specified playground or activity locations (e.g., playground markings, physical structures, allocated physical activity spaces, activity zones); teacher-led activities (e.g., fitness breaks, physical education activities on playgrounds); greening projects (e.g. trees, rocks, and gardens); and movable and recycled materials and games and sports equipment that facilitate structured activities (Hyndman 2015).

In this article, we use the social-ecological model to explore influences on children's active play on school playgrounds. Interventions, simultaneously, affecting multiple levels can achieve effective and long-lasting healthy outcomes (Salmon and King 2010). We present an account of the diverse range of possible intrapersonal, interpersonal, physical environment, and policy influences on active play on school playgrounds to argue that the social-ecological model is the most appropriate theoretical model for such study.

Intrapersonal Influences

Intrapersonal influences on children's active play involve an individual's knowledge, behavior, attitudes, and skills. Age, sex, and body mass index (BMI) are the

most commonly measured interpersonal influences on children's play (Ridgers et al. 2010; Ridgers et al. 2012; Stanley et al. 2012; Stanley et al. 2014).

The relationship between age and active play on school playgrounds is not yet clear. A number of studies have found no association between them (Ridgers, Stratton, and Fairclough 2005; Beighle et al. 2006). Others have claimed that older children are more likely to be sedentary (e.g. sitting or standing) or to engage in lighter play than younger children (Lopes et al. 2006). Similarly, findings from a twelve-month school playground intervention revealed that the older a child was, the less likely he or she was to engage in vigorous active play on a school playground (Ridgers, Fairclough, and Stratton 2010). In contrast to these studies, other researchers who examined the impact of themed weekly activities on school playgrounds (e.g. fitness circuit weeks, obstacle course weeks, Frisbee weeks) found that older children made significantly higher steps than younger ones (Stellino et al. 2010). However, the study was limited by its small sample size and the measurement of a single active play dimension (steps), rather than examining other dimensions such as the intensity, duration, and frequency of the active play. The measurement of such multiple dimensions is important to understand fully school children's active play behavior (Kriemler et al. 2011; Hyndman 2015).

Investigators have discovered gender to be the most common demographic variable that correlates to children's active play on school playgrounds (Ridgers et al. 2010; Ridgers et al. 2012; Stanley et al. 2012; Stanley et al. 2014). In thirty-one studies of the intrapersonal elements of children's active play, being male correlated with greater active play (Ridgers et al. 2012). This finding supports previous reviews of preschool, childhood, and adolescence play (Hinkley et al. 2008; Sallis, Prochaska, and Taylor 2000; Van Der Horst et al. 2007). Often girls seem to view school playgrounds as a place to socialize; therefore, the school playground activities in which they engage should place a high priority on social play (Vu et al. 2006). Boys require fewer social interactions and regularly engage in and enjoy rough-and-tumble play such as football (Knowles et al. 2013). We need more research to examine the correlates of boys' and girls' active play separately rather than simultaneously (Ridgers et al. 2012).

A few researchers have examined the relationship between BMI and children's active play during school breaks. Ridgers and colleagues found no differences in four United States elementary schools between the engagement of non-overweight and overweight children in moderately vigorous active play (Ridgers et al. 2013). Non-overweight children engaged in significantly more

vigorously active play, and overweight children engaged in significantly less moderately active play. Similarly, a twelve-month school playground intervention revealed that children of a healthy weight participated in more active play than overweight children (Ridgers, Fairclough, and Stratton 2010). However, a cross-sectional study of New Zealand children using self-report measures found that overweight or obese children were at least 27 percent more likely to engage in active play than children who were not overweight or obese (Hohepa et al. 2009). Although the findings in these studies were mixed, others have discovered no association between BMI and children's active play on school playgrounds (Ridgers, Stratton, and McKenzie 2010; Stellino et al. 2010; Stratton et al. 2007). This suggests that significant room remains for research on intrapersonal variables in school playground activities. In addition to BMI, intrapersonal variables like ethnicity, religion, and disability on physical activity have also been relatively unexplored and warrant further investigation (Ridgers et al. 2012).

Researchers have also discovered that children's enjoyment of socializing, self-efficacy, development of skills, freedom to make up rules, and the positive feelings they have about active play can all be intrapersonal facilitators of active play on school playgrounds. Intrapersonal barriers to this play include feelings of incompetence, low motivation, or a preference for sedentary behavior (Stanley, Boshoff, and Dollman 2012). Interviews conducted with principals, teachers, and children from six elementary schools have also revealed that the fundamental motor skills (FMS) of a child has a major influence on his or her active play (Parrish et al. 2011). Teachers from this school playground study suggest that, because FMS were not a priority at the school, many children lacked basic skills to engage in active play, were embarrassed to participate in active play, and were bullied. Additionally, the teachers said that overweight or obese children tended not to engage in enough active play. A study by Thompson and associates also identified self-efficacy, fun, enjoyment, and improvement of skills as intrapersonal motivations for children to engage in active play (Thompson, Humbert, and Mirwald 2003).

Because males are more likely to engage in active play on the school playground than females (Ridgers et al. 2010; Ridgers et al. 2012; Stanley et al. 2012; Stanley et al. 2014), interventions should be designed to encourage such play among girls. Offering opportunities for noncompetitive, unstructured play promises to address a significant gender difference in active play on school playgrounds, as does providing more variety in playground equipment to enhance

children's socialization, better their development of FMS, increase their interest in game challenges, and provide greater freedom in their play (Hyndman, Benson, and Telford 2014; Hyndman 2015).

Interpersonal Influences

Interpersonal influences include relationships—culture and social—that have a major impact on children's active play. These are especially important because most children prefer having someone to play with (Pellegrini et al. 2002).

Studies have identified peer and teacher support as positive correlates to children's active play on school playgrounds (Hyndman et al. 2012; Stanley, Boshoff, and Dollman 2012). They also find that children consider play partners and social acceptance as the keys to their engagement in active play (Hohepa et al. 2007). Furthermore, the research suggests that adult support for active play and teacher encouragement (rather than structuring) of it positively influence children's engagement (Thompson, Humbert, and Mirwald 2003).

Studies have also examined the relationship of socioeconomic status (SES) and children's active play. Using a direct observation instrument, one group of researchers found no significant differences between the active play on school playgrounds by children based on their SES (Mulvihill, Rivers, and Aggleton 2000). In contrast, another group found that children in private schools played more intensely during the school day than children attending public schools (Gonzalez-Suarez and Grimmer-Somers 2009). One study reports that children attending French elementary schools with a higher SES engaged in more moderately and vigorously intense active play compared to those attending lower SES schools (Baquet et al. 2014). We clearly need more research examining the link between children's SES and their active play on school playgrounds.

Some researchers have investigated the supervision of school playgrounds and children's active play, with mixed results (Cardon et al. 2008; McKenzie et al. 2010). Several have observed children engaging in active play less frequently in directly supervised areas and have suggested that the culture of promoting safe play areas can inhibit active play (McKenzie et al. 2010; Hyndman 2015). This gap between supervision and active play also emerged in direct observations of eighteen elementary schools in the Move It or Groove It project (Zask et al. 2001) and at eight elementary schools in the System of Observing Chil-

dren's Activity and Relationships during Play (SOCARP) development study (Ridgers, Stratton, and McKenzie 2010). But some studies found just the opposite—that a higher number of children participated more intensely in active play when teachers supervised the school playground (Willenberg et al. 2009). Because the teachers played a passive role during their playground supervision and did not encourage active play, this finding surprised the researchers. The inconsistent findings about the relationship between teacher supervision and children's active play on school playgrounds in the United States, the United Kingdom, and Australia could be attributed to different settings, different cultural influences, and different staff. If a physical education or sport coordinator supervises the playground, children at some schools may also feel more inclined to demonstrate their physical skills during active play. Clearly, all this warrants further investigation into children's perceptions of teacher supervision of active play on school playgrounds.

Bullying has emerged as a major barrier to children's active play on school playgrounds. This bullying includes stealing equipment (Stanley, Boshoff, and Dollman 2012) and gender and weight-related intimidation that prevents others from playing (Bauer, Yang, and Austin 2004). In one study, three of the four schools at which principals admitted bullying took place witnessed the lowest levels of active play on their playgrounds (Parrish et al. 2011). Children can be intimidated not just by bullies but also by large numbers, and—in both cases—they seek, in response, quiet playground areas (Blatchford 1994). Other barriers to active play similar to bullying include having no peers with whom to play and the failure of peers to get along, both of which can limit group activities. A related barrier—at least potentially—to active play comes from the fact that children play whatever activity peer groups want to play, even if the activity is sedentary (Stanley, Boshoff, and Dollman 2012).

Because, as the research has established, social encouragement affects whether children play more actively, playground interventions should promote supportive interpersonal environments. And school playground interventions need to engage children in activities that prevent bullying during school breaks (Parrish et al. 2011). One promising intervention, shown to help develop key interpersonal play, is the introduction of movable or recycled materials onto a school playground (Hyndman, Benson, and Telford 2014; Bundy et al. 2009). Teachers in a small, pilot-school, playground intervention found positive social inclusion, resilience, and teamwork among children to result from introducing movable or recycled materials (Bundy et al. 2009).

Physical Environment

Many children wish their physical environment provided more opportunities for active play on school playgrounds (Hyndman et al. 2012). In Australia, school playgrounds contain many natural features (e.g., bushy areas, grassed areas, trees, and ponds or streams) as well as built structures (e.g., fixed playground equipment, playground markings, sports equipment, sandpits, shade sails, asphalt and concrete play areas) (Chancellor 2013). An awareness of the need for such natural settings should precede school or community playground initiatives (Hyndman, Benson, and Telford 2014).

Influence of Facilities

Researchers have examined the impact of the physical environment on children's active play on school playgrounds (Ridgers et al. 2010; Ridgers et al. 2012, Stanley et al. 2012; Stanley et al. 2014). They have, for example, frequently studied (mainly in secondary schools) the positive effect of outdoor facilities such as sporting courts and grassy areas (Haug et al. 2010). Although the results are mixed for sledding hills, soccer fields, and green spaces increasing the odds of active play on school playgrounds (Haug, Torsheim, and Samdal 2008; Haug et al. 2010), no such increase has been found in association with ball parks and most other sporting fields, ski slopes, watery areas, or woods (Haug, Torsheim, and Samdal 2008; Willenberg et al. 2009). Nevertheless, studies that examine the quantity of playground facilities (Haug, Torsheim, and Samdal 2008; Haug et al. 2010; Anthamattan et al. 2014) and sporting facilities (Jones et al. 2010) on school playgrounds found positive correlations between them and children's active play. This suggests that school playground interventions should focus on providing substantial equipment to encourage active play.

Although researchers have observed that loose sports equipment, such as bats, balls, and skipping ropes, on the school playground positively influences children's active play (Willenberg et al. 2009; McKenzie et al. 2010; Ridgers, Stratton, and McKenzie 2010), the same cannot be said conclusively for fixed playground equipment and markings based on studies of both children and adolescents (Haug, Torsheim, and Samdal 2008; Dymont, Bell, and Lucas 2009; Willenberg et al. 2009; Parrish et al. 2009; Haug et al. 2010). On the other hand, some studies report that playground markings and shadings (Parrish et al. 2009; Dymont, Bell, and Lucas 2009), fixed equipment (Willenberg et al. 2009), sporting equipment (Hyndman and Lester 2015), high intensity activities like sprint-

ing and, and obstacle courses (Haug, Torsheim, and Samdal 2008; Hannon and Brown 2008) facilitate children's active play. And for junior adolescents, a study of hopscotch shows fixed equipment increased the odds of active play (Haug et al. 2010). However, other studies suggest the opposite, that playground markings, fixed equipment (Ridgers et al. 2010), boarding areas (Haug, Torsheim, and Samdal 2008; Haug et al. 2010), playground design (Jones et al. 2010), climbing equipment (Haug, Torsheim, and Samdal 2008), and a fenced courtyard (Haug, Torsheim, and Samdal 2008) did not increase active play. And the hopscotch study itself identified no association between fixed playground equipment and hopscotch markings and the odds specifically of female adolescents engaging in active play on school playgrounds (Haug et al. 2010). Given these findings, we should note that just three of these studies used valid objective methods (e.g. accelerometers, direct observation) that might have established more conclusive connections (Dollman et al. 2009).

Influence of Weather

A number of studies continue to investigate the influence of weather on children's active play on school playgrounds, revealing that higher temperatures contribute to more active play (Lindquist, Reynolds, and Goran 1999; Wheeler et al. 2010; Barnett et al. 2009) and that rain discourages play (Duncan et al. 2008; Harrison et al. 2011). Australian school children enjoy active play on school playgrounds mostly at the beginning of the school year with its warmer weather (Hyndman, Chancellor, and Lester 2015). However, in the north of England, one study associates cooler temperatures during dryer weather with more active play on school playgrounds (Fairclough et al. 2012). The heat stress of higher temperatures also has negative effects on children's active play (Zask et al. 2001). More generally, the time of year and season have been shown to exercise little influence on children's active play on school playgrounds (Ridgers et al. 2005; Ridgers et al. 2006). And one study shows that children enjoy active play at lunchtime over several days regardless of cold weather and wintry conditions (Hyndman, Telford, et. al. 2014).

Children's Perceptions of School Playgrounds

The spaces where children engage in active play are important, yet little research has examined the link between such play and indoor (Dale, Corbin, and Dale 2000) or outdoor space (Ridgers et al. 2010; Fairclough et al. 2012).

At five Turkish elementary schools, many children (77 percent) enjoyed

active games. Most (52.1 percent) enjoyed spending school breaks on school playgrounds. And even more (79 percent) thought having an area to produce food was important (Ozdemir and Yilmaz 2008). Almost half of these children believed their school playground was too small and lacked spaces for play, trees, and greenery, yet a similar number from poorer schools with less well-appointed playgrounds seemed satisfied with their school's play space (Ozdemir and Yilmaz 2008).

Some researchers have suggested that large sporting areas do not necessarily increase children's active play on school playgrounds (Ridgers et al. 2012). In the Turkish study, where children who were satisfied with their playgrounds preferred them for active play, over a third described their ideal playground as containing many trees and much greenery (Ozdemir and Yilmaz 2008). Similarly, the study associated the children's positive perceptions of the school play environment with mediated interventions and higher participation in active play during school breaks (Yildrum et al. 2014). These results, combined with other studies examining children's perceptions of the school playground for active play, can inform future school playground interventions.

Understanding how children engage in active play in the physical environment helps us identify and develop effective school playground interventions (Hyndman et al. 2012). In light of this, one study assessing active play choices on school playgrounds found not only a need for more playground equipment but also for a greater variety of it. In addition, the study identified access to fixed equipment for older children with an increase in active play. This suggests that different equipment encourages active play depending on the age group it suits. Children in the study preferred colored bitumen markings with minimal lines and grassy areas on which to run and play games. And, finally, they liked metal playground structures more than wooden playground structures (Willenberg et al. 2009). Because some children prefer fixed playground structures of different materials (e.g. wood, plastic, metal), providing them the opportunity to play on those of their choice might produce a more conclusive association between the presence of fixed playground equipment and children's active play (Ridgers et al. 2012).

A variety of playground equipment has consistently been a key to engaging children in active play (Dyment, Bell, and Lucas 2009, Hyndman et al. 2012; Hyndman, Benson, and Telford 2014b). Therefore, providing children with options can promote the sense of choice, long established as a major element of children's enjoyment of play (Stellino et al. 2010). Play scholars define recess

periods in elementary schools as a regularly occurring free choice that allows children to enjoy active play on school playgrounds. Offering equipment on school playgrounds that promotes such choice promises active play that accommodates children's differences in gender, age, and weight (Dollman et al. 2009).

Children often perceive the built environment (e.g. sporting facilities, adventurous equipment, and fixed playground equipment) as an inducement to active play on school playgrounds (Hyndman et al. 2012) rather than in lounges or lunchrooms. The natural environment (e.g., trees, grass, water, and rocks) also encourages active play (Dyment, Bell, and Lucas 2009). Spaces need to be suitable for given activities (e.g., a field for football rather than a court), and the weather needs to cooperate (Stanley, Boshoff, and Dollman 2012). On the other hand, children often find large spaces, crowded areas, aging or broken-down facilities, and bad weather barriers to active play on school playgrounds (Ridgers et al. 2010). We need to understand these children's perspectives to inform interventions in their play (Hyndman et al. 2012).

Providing Movable Equipment

Mounting evidence suggests our interventions to develop children's active play should add movable equipment (e.g., nonfixed playground items) to school playgrounds (Bundy et al. 2009; Ridgers et al. 2012; Hyndman, Benson, et al. 2014; Hyndman 2015). In addition, movable playground equipment benefits active play by helping prevent bullying. And, without movable play equipment, playgrounds offer only plain grass and cement (Parrish et al. 2011). The research has identified a range of physical, social, and cognitive benefits for active play from movable or recycled materials (Bundy et al. 2009; Engelen et al. 2013; Hyndman, Benson, et al. 2014; Hyndman 2015). Because age and gender can have a significant influence on children's active play, providing diverse, movable playground equipment helps shape their play choices (Ridgers et al. 2012), and the more diverse the equipment, the larger numbers of school children engaged in play on school playgrounds (Hyndman et al. 2012; Hyndman, Benson, and Telford 2014b).

Policy and Organizational Influences

Regardless of the intrapersonal, interpersonal, and environmental strategies we implement to shape active play, each needs to be reinforced by supportive organizations and their policies. Yet few have explored the influences of such policies on school children's active play on school playgrounds (Haug, Torsheim,

and Samdal 2009). As schools make less time available for active play, we should focus on school policies to reverse the trend (Nelson et al. 2006; Story, Nanney, and Schwartz 2009; Haug, Torsheim, and Samdal 2009).

Implementing policies that facilitate active play can be challenging however (Hyndman and Telford 2015). The policies based on the social benefits of active play are more likely to succeed (Telford 2010). Although a number of studies examined different policies, they have found only limited, inconclusive evidence of their positive affect on active play on playgrounds (Ridgers et al. 2012). Studies about the relationship between children's active play on school playgrounds and play in physical education departments have produced mixed results (Faison-Hodge and Poretta 2004; Pitetti, Beets, and Combs 2009). Some have looked at the gender-specific differences in active play and play in physical education programs and found that, although boys and girls engaged in similar activities during physical education, boys engaged in more active play on school playgrounds (Sarkin, McKenzie, and Sallis 1997). Furthermore, studies have reported that children are generally more active on school playgrounds than during physical education classes (Sleep and Warburton 1992).

Some have also examined the relationship between physical education programs and children's active play on school playgrounds in special needs settings (Sit et al. 2008). A combination of involvement in structured physical education classes and in free active play during school breaks help special needs children meet—or exceed—the recommendations they receive for physical activity (Pitetti, Beets, and Combs 2009). Children with mild intellectual disabilities who participate in a program that emphasizes sports are more likely to play more intensely during physical education than during breaks on school playgrounds (Sit et al. 2008). However, those who participate in a program with a recreational focus tend to accumulate more minutes in active play (Sit et al. 2008). Similarly, children spent more time in high-intensity activity during physical education classes than in free play on school playgrounds (Pan 2008). Although some studies have examined the influence of both structured physical education classes and free active play on school playgrounds, more recent research has investigated school policies that require a sufficient blend of time on both, especially outside special needs settings.

Research on the association between a school's policy on the length of recess and children's active play on school playgrounds has also been mixed. Many studies examining active play on school playgrounds (Cardon et al. 2008) have revealed that children play longer and harder when a school increases its

break time. And the number of children engaging in high-intensity, active play on school playgrounds increases with longer breaks (Ridgers et al. 2007).

Not just these limited findings but also the fact that these written play policies for school playgrounds form the rules and regulations under which children play suggest the need for further research on the influence of school organizations on children's active play (Ridgers et al. 2012; Haug et al. 2010).

One impact of a major policy about active play on school playgrounds relates to equipment. But barriers to children's active play within school playgrounds may involve more than equipment. It may include a lack of access to facilities or programs, a lack of replacement of facilities, even weather policies (e.g., staying inside when it is too hot). The same is true for safety rules and scheduled lunch periods that limit the time available to engage in physical activity (Hyndman et al. 2012; Hyndman and Telford 2015). School dress codes that require school uniforms or other items unsuitable for active play (e.g., formal footwear or a "no hat, no play" policy) can negatively affect children's active play on the school playground (Parrish et al. 2011). Providing school uniforms suitable for active play may need to be reviewed in general. A recent study examined the impact of replacing winter uniforms with sports uniform and revealed that girls engaged in significantly more active play on school playgrounds when they could wear a uniform conducive to playground activities (Norrish et al. 2012). This suggests that children's attire, especially for girls, may not be suited to active play on school playgrounds, and it warrants further research on the influence of clothing on active play (Willenberg et al. 2009).

Finally, studies suggest that access to equipment plays a major role in facilitating active play on school playgrounds. Therefore, when we develop playground interventions to encourage active play, it is important that we provide sufficient equipment to ensure all children such access.

Conclusion

Identifying the correlates of children's active play on school playgrounds by applying a social-ecological model is important for developing and evaluating school playground interventions. The social-ecological model correlates we identified suggest that the promotion of choice and variety, movable (nonfixed) playground equipment, social encouragement, and inclusiveness are all key to long-lasting, active play among children on school playgrounds. All those seek-

ing to enhance children's active play will find such information crucial to their policies and programs for school playgrounds.

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