



## An observational study of children's behaviors across two playgrounds: Similarities and differences

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### ABSTRACT

The purpose of this study is to explore similarities and differences in physical activity levels for boys and girls in seven areas across two playgrounds. Two playgrounds in a mid-Atlantic state in the United States were purposefully selected based on their playground design and structure. The System for Observing Play and Leisure Activities in Youth was used to document children's physical activity types, track children's locations, and code activity type. Playground A had five different areas, and Playground B had three different areas. Across the two playgrounds, data were collected across 416 total 1-minute intervals (morning, afternoon, and evening), spanning 13 days (weekend and weekdays) over a three-month period. The implications of this work are detailed observations of children's play equipment and activity choices may provide insight into optimal playground equipment design and layout for play and social interactions between peers; fixed contemporary play equipment and open play spaces should be considered when designing new community playgrounds, as they appear to be equally interesting to boys and girls; and girls' attire on a community playground and more available play space may contribute to more active play in girls than what was found in studies investigating play patterns on school playgrounds.

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### 1. School and community playgrounds

Children have opportunities to play on school and community playgrounds. School playgrounds are typically located on the grounds of elementary schools. During regular school hours, the school playground is used for recreational purposes—either for school recess or physical education (PE, gym class). When school is not in session, schools may leave the playground unlocked for children to use, not under the supervision of school staff. Community playgrounds fall under two categories—a neighborhood and a destination playground (Consumer Product Safety Commission (CPSC), 2015). A neighborhood playground is defined as a playground that is built in a residential community. Its purpose is to provide children with a place to play within walking distance of where they

live. A destination is a playground that is built in a place where playground patrons are expected to drive or take public transportation in order to utilize the play space.

The play equipment and the play area may be the same or vary at school and community playgrounds (CPSC, 2015). The safety standards that apply to school and community playgrounds are also the same (National Program for Playground Safety (NPPS), 2010). The main differences between school and community playgrounds are the location, the number of similar aged children available for peer play, and overall rules and expectations established by adults (Solomon, 2014).

School and community playgrounds typically fall into one of three playground designs (Hayward, Rothenberg, & Beasley, 1974). A traditional playground has separate pieces of playground equipment that do not connect to one another. Usually swing sets, individual slides, and see saws are found on a traditional playground. A contemporary playground has different pieces of playground equipment that connect together to form a continuous structure. Contemporary playgrounds are the most common design

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found on many school and community sites (Susa & Benedict, 1994). An adventure playground is a playground where children create their own play environment out of equipment made available to them. Equipment can be items in nature such as sticks, leaves, water, or mud or discarded items such as old tires or boxes. Given that many schools and communities have to abide by safety rules and regulations, many do not choose to have an adventure playground (Brown & Burger, 1984).

## 2. Children's activity patterns in different playgrounds: Similarities and differences

Social participation refers to how individuals act on and interact with their social surroundings (Cosbey, Johnston, Dunn, & Bauman, 2012). Play is an integral part of children's social participation, with community and school playgrounds serving as the environmental context for children's play (Pellegrini & Smith, 1993). Considerable research has examined the availability of playgrounds and their association with physical activity in children (e.g., Babey, Hastert, Yu, & Brown, 2008; Farley, Meriwether, Baker, Rice, & Webber, 2008; Potwarka, Kaczynski, & Flack, 2008). However, fewer studies have investigated whether specific features of playgrounds (e.g., playground equipment features, availability of grassy areas) are associated with increased levels of social participation (Kaczynski & Henderson, 2007).

Earlier studies have evaluated the effects of playground design and equipment on children's overall pretend play levels. For example, Susa and Benedict (1994) reported that children were more creative in their play when they interacted on more contemporary playgrounds which were more thematic in nature (e.g., spaceship theme, car theme, castle theme) and had tunnels and bridges. Another study found that playgrounds with dramatic play equipment, tire swings, construction play equipment, and water play materials encouraged more cooperative play rather than competitive play in children (Barbour, 1999). Findings such as these have encouraged some schools and communities to be more strategic in the design of their playgrounds by offering more choices (e.g., fixed play equipment, activity choices) to children while playing outside (Ridgers, Stratton, Curley, & White, 2005).

Recent research has focused on the role of fixed playground equipment in promoting physical activity (e.g., Berg, 2015; Farley et al., 2008). For example, fixed playground equipment on contemporary school and community playgrounds (i.e., slides and jungle gyms) led to more moderate-to-physical activity in children, regardless of configuration, complexity, and challenge of the fixed equipment (Anthamatten, Brink, Kingston, Kutchman, Lampe, & Nigg, 2014; Dyment, Bell, & Lucas, 2009; Farley et al., 2008). These research findings suggest that all playgrounds should be designed with ample fixed play equipment. Given that prior work has also demonstrated that playgrounds do not need to be large for greater amounts of physical activity in children (Farley et al., 2008), it appears that children will be physically active on any school or community playground that has fixed playground equipment. One goal of this study is to test whether this hypothesis is true.

## 3. Playground equipment and gender differences

The type of playground environment influences the type and amount of play in children. Indeed, early playground research demonstrates that children's play behaviors are influenced by the amount of physical space per child (Smith & Connolly, 1977), how the physical space is delineated (Dempsey & Frost, 1993), the configuration and type of fixed playground equipment (Frost & Campbell, 1985), the complexity and challenge of the fixed playground equipment (Moore, 1985), the presence and absence of

enclosed areas (Brown & Burger, 1984), and linkages of equipment (Johnson, Christie, & Yawky, 1987). These findings continue to hold true in more current studies (e.g., Escalante, Garcia-Hermoso, Backx, & Saavedra, 2014; Larson, Normand, Morley, & Hustyi, 2014). Additionally, children's play behaviors increase when grassy areas (Berg, 2015), swings (Anthamatten et al., 2014), soft surfaces and a fence (Nasar & Hollomon, 2013), game equipment such as balls (Escalante et al., 2013), and shade (Colabianchi, Maslow, & Swayampakala, 2011) are provided.

The impact of gender on children's play has centered mainly on school playgrounds. Gender segregation in children appears around three years of age and continues to approximately 11 years (Maccoby, 1998). Boys tend to prefer competitive sports (e.g., football, basketball) as their preferred playground activity, whereas girls tend to sit and talk with same-gender peers (Anthamatten et al., 2014; Blatchford, Baines, & Pellegrini, 2003; Paechter & Clark, 2007; Pearce & Bailey, 2011). If fixed playground equipment is available, boys tend to use it while girls do not (Anthamatten et al., 2014). Factors examining the reasons behind gender differences on the playground have focused on clothing and the overall playground area. For example, Stanley, Boshoff, and Dollman (2011) reported that school uniforms, dresses, and skirts may restrict girls' outdoor play. Escalante et al. (2013) noted that the large playground area required by the competitive sports boys play may consequently "push" girls to the peripheral area of the playground, where they only have room to chat. Overall, there is a general consensus that boys and girls vary in how they play on a school playground and make use of its equipment. A second goal of this study is to determine if gender differences occur on community playgrounds.

## 4. Purpose of the study and research questions

Given that fixed playground equipment has been found to be an important trigger of physical activity in children, the purpose of this study is to examine whether areas with similar equipment on two different playgrounds are characterized by similar activity levels (overall and for females and males) in both playgrounds. If there are no significant differences, this suggests the two areas operate similarly in different contexts, and therefore, the remaining areas can be compared regardless of playground. If two areas with similar composition significantly differ from each other, this suggests the two playgrounds differ and the areas can only be compared within playground (not across). Analyses of interest include examining child behavioral differences by sex. Research questions include the following:

1. Given Playgrounds A and B have one similar area (Area 1), to what extent do children's activity patterns differ in this area between two playgrounds?
2. For each area within a playground, to what extent do behaviors vary, and how so, for girls and boys?

## 5. Methods

### 5.1. Setting

Two different community playgrounds in a mid-Atlantic state were included in the study. These playgrounds were selected as they were recently built playgrounds intended to be fully inclusive for all children, including those with disabilities. Local community members raised funds for equipment for both playgrounds.

At the time of the current study, the community surrounding Playground A had 12,144 residents, self-categorized as follows: 79% White, 10% Asian, 6% Black, 2% Hispanic/Latino, 2% classified as two or more races, and 1% classified as other (U.S. Census, 2015). The

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