GROWING UP IN THE INNER CITY
Green Spaces as Places to Grow

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ABSTRACT: Children growing up in the inner city are at risk for a range of negative developmental outcomes. Do barren, inner-city neighborhood spaces compromise the everyday activities and experiences necessary for healthy development? Sixty-four urban public housing outdoor spaces (27 low vegetation, 37 high vegetation) were observed on four separate occasions. Overall, inner-city children’s everyday activities and access to adults appeared remarkably healthy; of the 262 children observed, most (73%) were involved in some type of play, and most groups of children (87%) were supervised to some degree. In relatively barren spaces, however, the picture was considerably less optimistic: Levels of play and access to adults were approximately half as much as those found in spaces with more trees and grass, and the incidence of creative play was significantly lower in barren spaces than in relatively green spaces.

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Trees and grass may foster everyday activities and experiences important in children’s development.

Growing up in the inner city is no small challenge; although many children show astonishing resiliency and outstrip even children from wealthy neighborhoods, countless children living in inner cities are falling behind developmentally. Living with chronic stressors such as ongoing poverty, inadequate housing and dangerous neighborhoods (McLoyd & Wilson, 1991), low-income urban children are at risk for a range of negative developmental outcomes. In the area of cognitive development, they are at increased risk for academic underachievement, more often retained in grade, and more often in need of special education (Lazar, Darlington, Murray, Royce, & Snipper, 1982). They are also less likely to graduate from high school (Brooks-Gunn & Furstenberg, 1986); young persons failing to graduate are, in turn, at increased risk for juvenile delinquency (Berrueta-Clement, Schweinhart, Barnett, Epstein, & Weickart, 1984) and teenage pregnancy (Furstenberg, 1976). In the areas of social and emotional development, inner-city living conditions (e.g., intense poverty, crowding) have been linked to relatively high rates of withdrawal, aggression, apathy, depression, and personality disorder (Belle, 1980; Kellam, Ensminger, & Turner, 1977; Levinson, 1969; Myers & King, 1983).

What could be done to help ensure that children living in poor inner-city neighborhoods develop to their full, healthy potential? In identifying factors necessary for healthy development, researchers outside the field of environment and behavior have focused on children’s social and economic environments. The current work focuses on the role of the physical environment in development, specifically the role of neighborhood outdoor spaces in supporting the everyday activities important for normal, healthy development. Two components of children’s everyday activity are key: play and access to adults. Before we examine the role of neighborhood outdoor spaces in supporting these activities, it seems useful to briefly review the contributions of play and adult access to children’s development.

mental sciences at the University of Illinois, Urbana–Champaign. A portion of the findings were presented at the Environmental Design Research Association (EDRA) conference held in Salt Lake City, Utah, in June 1996. We would like to thank the resident observers, Esther Davis and George Davis, as well as the resident management and residents of Ida B. Wells. Correspondence concerning this article should be addressed to Andrea Faber Taylor, Human Environment Research Laboratory, 1103 S. Dorner Dr., Urbana, IL 61801.
TWO KEY ACTIVITIES IN CHILDREN'S DEVELOPMENT

Play, "the work of children," has a key role in two major areas of development—social development (e.g., Garvey, 1977; Greif, 1977; Hartup, 1978; Rubin, Fein, & Vandenberg, 1983) and cognitive development (e.g., Piaget, 1962; Sylva, 1974; Sylva, Bruner, & Genova, 1976). (For comprehensive reviews of the role of play in early development, see Barnett, 1991; Rubin et al., 1983.) In the area of social development, play provides opportunities to acquire and practice social skills and prosocial behaviors. For example, collaborative games and pretend scenarios require cooperation, altruism, concern for others, the ability to comprehend and flexibly interchange social roles, and self-control (e.g., Damon, 1978; Piaget, 1976; Shantz, 1975). Furthermore, play provides opportunities for children to confront and resolve emotional crises, manage interpersonal conflicts, and gain moral understanding (e.g., Piaget & Inhelder, 1969; Shantz, 1975).

In the area of cognitive development, play provides opportunities for the acquisition and use of important cognitive skills and structures (e.g., Piaget, 1962; Sutton-Smith, 1967, 1971; Vygotsky, 1978). Theorists have long argued for a close relationship between play and the development of language (Piaget, 1926; Werner & Kaplan, 1963), and numerous studies have found relationships between aspects of children's play and language comprehension and production (Collier, 1979; Garvey, 1974, 1979; Lovinger, 1974; Reynolds, 1972; Smilansky, 1968). Furthermore, some forms of play provide children with opportunities to experiment and explore multiple problem-solving techniques (Barnett, 1976; Sylva et al., 1976). Campbell and Frost (1985) draw on developmental theories and empirical studies to suggest that the level of interaction and complexity in play is related to cognitive development. Of the various forms of play, creative play—play that is often conversationally mediated, that has flexible participation rules, and that is open-ended—may be the most beneficial.

Like play, access to adults has a key role in children's social and cognitive development. As it is difficult to imagine how children might become fully functioning members of society without the guidance, challenge, and models provided by adults, a few examples suffice to illustrate the point. With respect to social development, it is through interaction with adults and adult supervision that children learn the values and appropriate interpersonal communication skills of their community (e.g., Miller & Sperry, 1987; Ochs & Schieffelin, 1984; Wiley, Rose, Burger, & Miller, in press); indeed, "lack of parental supervision is one of the strongest predictors of the development of conduct problems and delinquency" (APA Commission on Violence and Youth, 1983, p. 19). With respect to cognitive development, linguistic inter-
actions and problem-solving interactions with adults are important mechanisms by which children’s language and reasoning skills advance (e.g., Bruner, 1983; Hoff-Ginsberg & Shatz, 1982; Rogoff, 1990; Snow, 1984).

Children’s healthy social and cognitive development may require sufficient quantities of play and access to adults; in this study, we examined children’s play and access to adults in neighborhood outdoor spaces.

**NEIGHBORHOOD OUTDOOR SPACE AS AN IMPORTANT SETTING FOR CHILDREN’S PLAY AND ACCESS TO ADULTS**

Because they are the site of so much of children’s unstructured everyday activity, neighborhood outdoor spaces may be a particularly important setting in which to study inner-city children’s play and access to adults. For children living in the inner city, access to outdoor parks and playgrounds is too often limited by busy streets, long distances, and gang-controlled territories, leaving them with only cramped indoor space or the outdoor spaces adjacent to their building as play space options. And given the choice to spend time indoors or outdoors, children generally prefer spending time outdoors (R. C. Moore, 1986). Perhaps as a consequence, children living in low-income urban neighborhoods spend a great deal of their free time in neighborhood outdoor spaces (Berg & Medrich, 1980; Lynch, 1977; Sanoff & Dickerson, 1971). The Baltimore Department of Planning and U.S. Department of Housing and Urban Development (cited in Hester, 1975, p. 149) observed low-income minority children in neighborhood settings, and found a high incidence of children in outdoor areas adjacent to residences: porches, yards, streets, sidewalks, and alleys. In comparison, very few children were found in local parks or playgrounds.

Neighborhood outdoor settings may be an especially interesting context in which to study play because creative play may be more likely in outdoor spaces than in indoor spaces; in one study, boys and older children participated in much more dramatic play in an outdoor play space than in an indoor play space of equal complexity (Henniger, 1985). Moreover, Schwartzman (1979) and Rubin et al. (1983) note a weakness in the literature specifically due to the lack of observational studies examining low socioeconomic status (SES) children in familiar, neighborhood play settings. According to Rubin et al., “Researchers have not, for the most part, investigated the play of different SES groups in the familiar surroundings of their neighborhoods or homes” (p. 736).

Neighborhood outdoor spaces may also be an especially interesting context in which to study children’s access to adults. It is outdoors, rather than indoors, that children may especially need adult supervision. Moreover, not
only do children spend a great deal of their free time in the outdoor spaces near their home, but adults in this population appear to make substantial use of these spaces as well. Clearly, both the need and the potential for children to have access to adults in neighborhood outdoor spaces exists.

Neighborhood outdoor spaces are likely to be important resources for inner-city children’s everyday play and access to adults and thus are important resources for supporting inner-city children’s development. In this study, we examined whether a specific feature of these outdoor spaces—the level of vegetation—might support children’s play and access to adults.

**DOES THE LEVEL OF VEGETATION IN AN OUTDOOR SPACE MATTER?**

Might the level of vegetation in an outdoor space affect the incidence of children’s play? Might it affect access to adults in these spaces? Past research suggests that these questions deserve further systematic examination.

A number of studies have indicated that features of the physical environment may affect play behavior (e.g., Ainsworth & Bell, 1974; Clarke-Stewart, 1973; Wachs, 1978; Yarrow, Rubenstein, & Pedersen, 1975). Furthermore, theorists in landscape architecture (e.g., Hayward, Rothenberg, & Beasley, 1974; Nicholson, 1971) and leisure studies (e.g., Aguilar, 1985) have proposed that physical settings affect the creativity of play; indeed, there is some indication that settings with certain types of play equipment and materials encourage more dramatic and imaginative play than do settings without (Campbell & Frost, 1985; G. T. Moore, 1983; Yerkes, 1982).

Although no research to date has examined the effect of vegetation on children’s play activities in multiple, comparable spaces, there is some indication that the level of vegetation in a space may affect play behavior and the creativity of play. R. C. Moore (1989) presented an intriguing collection of anecdotal evidence and argued that children played quite creatively in an outdoor space when playing with readily available plant materials. Although Moore’s study lacked any comparisons to spaces without plant materials, Kirkby’s (1989) study featured such a comparison and found more dramatic play in the “green” spaces than in the built space. Unfortunately, Kirkby’s findings were based on only two green spaces and a single built space, with spaces differing on a variety of important dimensions in addition to “green-ness,” making it difficult to say whether the vegetation was responsible for the creativity of play in the green spaces.

Given the possibility of a relationship between vegetation and play, is it also possible that green outdoor settings promote children’s access to adults? Hayward et al. (1974) found that although children visited each of the different playgrounds in their study, adults visited only those playgrounds
that Hayward et al. characterized as aesthetically pleasing; thus, environmental features that make a neighborhood outdoor setting attractive to adults might make adults more available to the children in that setting. A recent study of two urban public housing developments found that both adults and children were attracted to outdoor spaces with higher levels of trees and grass (Coley, Kuo, & Sullivan, 1997). “Greener” outdoor spaces (spaces with more trees and grass) were consistently more likely to be used by adults, by children, and by children in the presence of adults than were more barren spaces.

Although the Coley et al. (1997) study provides information about spaces where children and adults are likely to be copresent, it did not examine the degree to which adults were accessible to children in those spaces. Accessibility requires more than merely an adult occupying the same space as a child; it includes availability for monitoring and assistance. This minimally requires that adults and children be visible to one another and that adults not have their attentional resources otherwise deeply engaged. There is yet to be systematic study of the effect of vegetation on children’s access to adults in outdoor spaces.

There is reason to suspect that the quantity of trees and grass in outdoor spaces may have important implications for children growing up in the inner city. Green spaces may promote play, creative play, and access to adults—central ingredients in children’s cognitive and social development. This study provides a descriptive snapshot of growing up in the inner city focusing on children’s everyday activities and experiences outdoors. This study also investigated the effects of the presence of vegetation on children’s outdoor play behavior and access to adults in urban public housing. Three research questions were addressed: Does the amount of vegetation in a neighborhood outdoor space encourage play behavior in that space? Does it encourage creative forms of play? And does it promote greater access to adults for children? Multiple, comparable outdoor spaces with varying levels of vegetation were observed in one public housing development on four separate occasions. On each occasion, the number of adults and children present, their specific activities, and their locations within the space were recorded.

METHOD

GENERAL RESEARCH SETTING AND POPULATION

This work was conducted as part of a larger study in Ida B. Wells, a public housing development in Chicago, Illinois. The development contains 110
low-rise (one to four story) apartment buildings. Each building is adjacent to one, two, or three other buildings, creating outdoor common spaces (courtyards). On average, 16 families share a single courtyard.

According to official statistics, the number of residents of Ida B. Wells is approximately 5,700, of which 97% are African American and 44% are children younger than 14 years of age (Chicago Housing Authority, 1992). Ida B. Wells is one of the 10 poorest neighborhoods in the United States (Ihejirika, 1995). The unemployment rate for the people living at Ida B. Wells is approximately 93%, and roughly 50% of the families in Ida B. Wells receive Aid to Families with Dependent Children (Chicago Housing Authority, 1992).

SPACES OBSERVED

There are 142 low-rise courtyards at Ida B. Wells. These courtyards range widely in amount of vegetation, and vegetation is not evenly distributed within courtyards. Because in several of the courtyards, trees were clustered at one end such that half of the courtyard was high in vegetation and the other half was low, each courtyard was divided into two equal-sized smaller spaces, and these smaller spaces were used as the spatial unit of analysis.

To assess levels of vegetation in each space, aerial photographs of the courtyards taken in summer were used to assign vegetation ratings. A team of five researchers rated each of the spaces in the development on a 5-point scale (1 = very little or no vegetation, 5 = a relatively high level of vegetation). Because grass was sparse and other plants were nearly nonexistent, level of vegetation was essentially the amount of tree cover. Inter-rater reliability for these ratings was .94. The median vegetation rating for spaces in the development was 1.9.

A sample of 64 spaces was selected to represent the entire continuum of vegetation from the most barren courtyards to the most green, tree-filled courtyards. To avoid confounding level of vegetation with other environmental features, spaces were selected such that architecture of surrounding buildings, vacancy rate of surrounding buildings, and distances from busy streets were approximately balanced across levels of vegetation. For chi-square and other analyses, spaces rated at or below the median for the development were designated low-vegetation spaces; spaces rated above the median were designated high spaces, yielding 27 low- and 37 high-vegetation spaces in the final sample (see Figure 1).
Figure 1: Examples of Low- and High-Vegetation Courtyards at Ida B. Wells
PROCEDURE

Each space was observed on four separate occasions. Observations were collected during the last week of September through the second week in October 1995. To increase the chances of finding children outside, observations were made on weekdays between 3:30 p.m. and 5:00 p.m., when children were home from school, and between 12:00 p.m. and 3:00 p.m. on Saturday. On weekdays, each of the two observers covered one fourth of the spaces in the sample; the remaining spaces were covered on the following day. On the weekend, the entire sample of spaces was observed within the 12:00 p.m. to 3:00 p.m. time period.

Observers walked from one space to the next following a route map designed to lead them past each space one time. To ensure that spaces would not always be observed by the same observer or at the same time of day, observers traded routes and routes were followed in reverse order for alternate observations.

RECORDING OBSERVATIONS

Two urban public housing residents from another development were hired to assist in developing an ecologically sensitive observation protocol and to conduct the actual observations. The “insider insight” of these resident collaborators was used to create culturally appropriate activity and age categories for the observations. Their input, along with piloting, permitted the creation of an efficient and appropriately detailed observational-recording form. As residents themselves, these trained observers were able to make observations in the least obtrusive manner possible; our observers reported that they were never questioned or approached by children during observation, and that there were no apparent disruptions in children’s activities due to observation.

Each observational recording form consisted of a detailed map of the to-be-recorded space and a table for entering information about each person observed in the space. Each row on the table corresponded to a person, and each column corresponded to a variable such as age, gender, and so forth. Rows were numbered, and the row number corresponding to each person was drawn on the space map to indicate that person’s location in the space.

Age was recorded in both years and broad categories. For children appearing to be between the ages of 3 and 12, age was recorded in years. For other persons, four broad age categories were used: “babies” (younger than 3 years); “teen” (13 to 19 years), “adult” (20 to 50 years) and “elderly” (older than 50 years). In the analyses that follow, the adult and elderly categories were collapsed.
Activity was both described in detail (e.g., “sword fighting with tree branches”) and recorded in six general categories (e.g., “play”). Space on the observation form was left for observers to describe each activity in concrete terms. In addition, general categories of activity were indicated by circling one of six categories: (a) eating related (e.g., buying ice cream, barbecuing), (b) doing chores/repairs, (c) socializing (e.g., talking, socializing), (d) entertaining (e.g., adults card playing, dancing), (e) resting/thinking (e.g., sitting quietly), and (f) playing (described further below).

To indicate groupings of individuals, a circle was drawn around each “group” on the space map. A group was defined as either one person who was alone, or a group of persons who were in close physical proximity to one another and had the same focus of attention.

For reliability purposes, observers simultaneously observed each of two spaces at the beginning of each observation day, after which they separated and followed their individual routes. Observers’ reliability for estimating children’s ages was 83%; differences between estimated ages were never more than 1 year. Reliability for recording activities was 99%, based on observers’ similar use of concrete terms in their descriptions. Reliability for recording group composition was 97%.

CODING PLAY

Using both the detailed descriptions and the general activity categories, children’s play activities were coded in one of nine subcategories. Subcategories were drawn from previous play taxonomies and consultation with our resident collaborators and refined in pilot observations.

Forms of pretend play were coded into four subcategories:

Sociodramatic pretend: cooperating to act out real-life roles and situations (e.g., playing house) (Smilansky, 1968).

Fantasy pretend: taking on roles not from real life (e.g., sword fighting with tree branches and pretending to be a Power Ranger) (Rubin et al., 1983).

Physical pretend: rough-and-tumble play (e.g., wrestling and play fighting) (Humphreys & Smith, 1987; Pellegrini, 1988).

Object-centered pretend: playing out pretend themes by moving an object through actions and speaking for it (e.g., playing with Power Ranger figurines, dolls, cars and trucks) (named “other-referenced” pretend in Rubin et al., 1983).

In contrast to previous play taxonomies, forms of rule-bound play were coded into two subcategories rather than a single category (e.g., “games-with-rules,” Smilansky, 1968). Pilot observation of children’s activities at Ida B.
Wells revealed a form of rule-bound play in this population that seemed distinct from rule-bound conventional play and was quite common (see Goodwin, 1990, and Heath, 1983 for ethnographic descriptions). Whereas rule-bound conventional play seems likely to foster developmental benefits such as self-control and memory skills through its adherence to prearranged rules, rule-bound creative play seems likely to foster developmental benefits such as language and collaborative skills.

- Rule-bound conventional: games with rarely negotiated rules and with little individualization (e.g., tag, card games, and basketball).
- Rule-bound creative: games involving wordplay and improvisation, with flexible, negotiated rules (e.g., clapping games, sing-song games, and jump-rope games). In this form of play, the creativity associated with formulating a new hand-clapping rhyme or adding some novel twist to a jump-rope routine is encouraged and admired.

Because rule-bound creative play involves the same creativity as pretend play and the same kinds of social and cognitive benefits as pretend play, from here forward, we will focus on pretend and rule-bound creative as creative forms of play. All other forms of play were coded into three subcategories:

- Functional: simple, repetitive motions (e.g., rolling a toy vehicle back and forth repeatedly) (Smilansky, 1968).
- Constructive: manipulating objects to create something (e.g., building with blocks and drawing a picture) (Smilansky, 1968).
- Exploratory: complex manipulation of objects without any obvious goal and in what appears to be an interested, exploratory fashion (e.g., hugging a tree and tugging on the branches, and tying string around a tree and then pulling on the string). This category was created post hoc to capture a form of play that did not fit any of the other subcategories.

**CODING ACCESS TO ADULTS**

Using information about adults’ and children’s locations and activities recorded on the observation form, each group of children’s access to adults was coded by researchers. Access was coded for groups of children rather than for individual children because pilot observations suggested that dyadic adult-child interaction was relatively rare in this setting and that adult-child interaction generally involved a single adult interacting with multiple children. To avoid implying that each child in such groups had access to an adult’s full attention, we used groups rather than individual children as the unit of analysis.
Access was coded into one of four categories:

- No access to an adult: no adults nearby, either in or out of view of the children.
- Partial access to an adult: at least one adult was in the same courtyard but was either out of view of the children or engaged in activities that might not allow for simultaneous monitoring. Such activities included doing chores or playing cards. Adults were considered out of view if they were depicted on the map as being around the corner of a building from the children but otherwise close by.
- Full access to an adult: at least one adult was in the same courtyard and readily accessible (within view of the group and involved in an activity that would make them easily available to respond to the children). Such activities included socializing, resting, listening to music, observing the activities of the space in general, and eating alone.
- Interacting with an adult: at least one adult was recorded as part of the group (and therefore both physically close to, and involved in the same activity as, the child or children).

Access to adults was coded twice, first restricting the definition of adults to persons identified as adult or elderly, then expanding the definition to include persons identified as teens. The second, more liberal definition was used to capture any supervision or access to teen parents and to capture supervision or access to older siblings.Coding reliability for all of these categories was established at 82%.

RESULTS AND DISCUSSION

In all, 377 groups (including groups of one) were observed in outdoor spaces. Of these, 30% contained children. For the 114 groups containing children (totaling 262 children), we examined the children’s activities and access to adults. Our aim was both to provide a picture of urban public housing children’s everyday activities and experiences in outdoor spaces and to examine whether vegetation is associated with more developmentally supportive activities and experiences.

URBAN PUBLIC HOUSING CHILDREN’S OUTDOOR PLAY

What do children do outdoors? The activity of each group containing children was coded as a type of play or nonplay. Some groups were not involved in play (27%, see Figure 2). Of these, some consisted of individual children who were spending quiet time alone. Others consisted of groups of
children socializing. Somewhat fewer were part of a familiar urban activity—group waiting, which included queueing for ice cream, a bus, and so forth. Some groups consisted of an adult attending to a very young child’s needs, such as changing a diaper or entertaining with a game of peekaboo. Only one incidence of genuine fighting (as opposed to play fighting) was observed: two 10-year-old boys “fighting with fists.”

Most groups of children observed outdoors in the development were involved in some type of play (73%). Figure 2 shows the incidence of play and nonplay activities. Because creative forms of play contribute a great deal to a child’s development, Figure 2 also describes the incidence of creative play.

Table 1 shows that children were participating in a rich variety of play, with pretend, rule-bound creative, and rule-bound conventional most frequent. The most common types of pretend play were physical pretend play, which includes wrestling and roughhousing, and object-centered pretend, such as playing with action figures and dolls. One quarter of the playing groups were involved in some form of rule-bound creative play, such as elaborate jump-robe routines, hand-clapping songs, and hopscotch. An equal number of groups were taking part in rule-bound conventional play, including games such as softball, card games, and tag.

There is a long-standing controversy in the play literature over whether low-SES African American children show less creativity in their play than
their more advantaged, European American counterparts. The current findings concerning both pretend play and rule-bound creative play bear on this debate. With respect to pretend play, although a number of studies have found relatively low quantities of pretend play in low-SES or African American populations (e.g., Rosen, 1974; Smilansky, 1968), a few studies have found substantial amounts of pretend play in these populations. Weinberger and Starkey (1994) examined pretend play in one sample of low-SES African American preschool children; they found that 30% of the children’s play was symbolic/pretend play and 95% of the children engaged in pretend play at least once. Rubin, Maioni, and Hornung (1976) found no difference in the quantity of pretend play for low- versus middle-SES children in a preschool class. Like Weinberger and Starkey and Rubin et al., we found a relatively high amount of pretend play (30%) compared to other past studies. Whereas the Weinberger and Starkey as well as the Rubin et al. studies had relatively small sample sizes (20 and 40 children, respectively) collected in school settings, the current findings are based on observations of more than 100 groups of children playing in their own residential outdoor settings.

With respect to rule-bound creative play, other observational studies have reported a unique form of creative play in this population. Goodwin (1990) and Heath (1983) present converging ethnographic pictures of African American children involved in complex, language-based forms of play, such as elaborate rhyming games, hand-clapping games, and verbal contests of “signifyin.” Although these types of play clearly are not pretend play, they involve comparable creativity and are likely to be of comparable benefit for cognitive and social development. Previous studies have focused on pretend play as the only form of creative play and thus may have undercounted the instances of creative play. It may be that rule-bound creative play appears as

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**TABLE 1**

**Incidence of Different Forms of Play in Outdoor Spaces (N = 83 groups)**

<table>
<thead>
<tr>
<th>Type of Play</th>
<th>Percentage</th>
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<tr>
<td>55% Creative forms of play</td>
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<tr>
<td>30% Pretend</td>
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<tr>
<td>22% Physical pretend</td>
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<tr>
<td>11% Object-centered pretend</td>
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<tr>
<td>7% Other forms of pretend</td>
<td></td>
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<tr>
<td>(fantasy, sociodramatic)</td>
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<tr>
<td>25% Rule-bound creative</td>
<td></td>
</tr>
<tr>
<td>45% Other forms of play</td>
<td></td>
</tr>
<tr>
<td>25% Rule-bound conventional</td>
<td></td>
</tr>
<tr>
<td>13% Exploratory</td>
<td></td>
</tr>
<tr>
<td>6% Other (functional, constructive)</td>
<td></td>
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</tbody>
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a companion to pretend play in poor African American children. This study is the first to quantify the incidence of these forms of play in this population, showing that rule-bound creative play constitutes a considerable percentage of African American children's outdoor play (25%). Furthermore, counting both rule-bound creative and pretend play yields a higher incidence of creative forms of play in this low-SES African American sample than has typically been found in middle-SES Caucasian American samples.

The relatively high percentage of pretend play observed in this study is consistent with the idea that pretend play occurs across a broader age range than has traditionally been examined. Past studies of pretend play with low-SES African Americans have typically examined preschool-age children. Eifermann (1971) reports findings that in one group of low-SES children, pretend play peaked a couple of years later than in comparable, more affluent children. Although there is no research on when rule-bound creative play begins or peaks, observations do suggest that it continues after pretend play disappears (Goodwin, 1990; Heath, 1983). Our findings are from observations of children ranging in age from 0 to 12 years. Perhaps in this population as well, the bulk of pretend play appears later than the preschool years. If that is true, the larger age range employed in this study may have permitted us to truly see how much creative play, pretend and rule-bound creative play these poor African American children actually do.

Overall, these findings show that when play is observed in an ecologically sensitive manner and over a broader age distribution, poor African American children exhibit a distribution of pretend and rule-bound play similar to that of other children.

*Does vegetation influence children's outdoor play?* Are greener outdoor spaces more supportive of play than their more barren counterparts? A *t* test confirmed that more play occurs in high-vegetation spaces than in low-vegetation spaces, *t*(61) = 1.96, *p* < .05, one-tailed. Vegetation made a considerable difference in the incidence of play; nearly twice as many children were observed playing in spaces with many trees (*M* = .95) as were observed playing in spaces with few trees (*M* = .49).

Why might levels of vegetation be related to the incidence of play? One possibility is that children are simply attracted to greener spaces, leading to a higher incidence of all activities in such spaces. If that were the case, the incidence of other activities would also be higher in greener spaces. In fact, the higher incidence of play found in greener spaces is not accompanied by a similarly higher incidence of nonplay activities in those spaces; a *t* test comparing high- versus low-vegetation spaces showed no significant difference in the incidence of nonplay activities (see Figure 3). Moreover, an
ANOVA shows that the effect of vegetation on incidence of activity is significantly different for play versus nonplay activities, $F(1, 61) = 5.1, p < .05$. These findings are consistent with the hypothesis that the level of vegetation in a space affects the incidence of play but not other activities.

Are greener outdoor spaces especially supportive of creative forms of play? Possibly. Whereas the incidence of more creative forms of play was significantly higher in high-vegetation spaces, $t(61) = 1.80, p < .05$, one-tailed, the incidence of other forms of play was not significantly higher (see Figure 4). Moreover, an ANOVA comparing the effect of nature for creative versus other forms of play was significant at trend level, $F(1, 61) = 2.6, p = .11$. These findings are consistent with the hypothesis that the level of vegetation in a space encourages creative play more than it encourages other play.

These data provide systematic evidence for a relationship between vegetation and children’s play behavior. Such a connection has been suggested in two previous studies that examined outdoor playgrounds (Kirkby, 1989; R. C. Moore, 1989). One study did not compare play in spaces with different levels of nature. The other study compared play behavior in one or two “natural” spaces to play behavior in one “built” space. Although the spaces differed with respect to nature, they also differed with respect to other environmental and demographic factors; as a result, the connection between play and nature was confounded. This study examined play behavior in 64 outdoor public spaces that were matched on a range of environmental variables (e.g., architecture of surrounding buildings, vacancy rate of
surrounding buildings, and distances from busy streets) in a way that unconfounds the vegetation-play relationship.

In sum, this study provides systematic evidence that the amount of vegetation in outdoor spaces is related to both the amount of play and the kind of play in which children engage in those spaces. There was more play, and more creative play, in spaces that have more trees. Is the amount of vegetation in outdoor spaces also related to children’s access to adults in those spaces?

**URBAN PUBLIC HOUSING CHILDREN’S ACCESS TO ADULTS OUTDOORS**

*How much access do children have to adults?* This study examined children’s access to adults as an indicator of both potential interaction between children and adults and potential supervision of children. For each of the 114 groups of children observed in outdoor spaces at Ida B. Wells, their access to adults was classified as (a) no access, (b) partial access, (c) full access, or (d) interacting.

Figure 5 shows that a small percentage of groups had no visible access to an adult, implying that those children were unsupervised or, at best, supervised through the windows of a nearby apartment. A substantial percentage of groups had partial access to adults. In these cases, children could have visual contact with at least one adult in the same space whose attention was not otherwise deeply engaged. More than half of the groups had at least one
adult fully accessible to them. These adults were in the same space and involved in an activity that allowed them to be attentive to the children. Finally, some groups of children were actively interacting with an adult or adults (10%). Expanding the definition of adult to include teens did not substantially affect the percentages (see Figure 5).

Because interaction with adults is the most developmentally beneficial form of children's access to adults, the few observed cases of interaction warrant a closer look. In these 11 groups, children and adults were observed close together and focused on each other or the same activity; 5 of these involved "children receiving care," 4 groups were engaged in "pretending," and 2 groups were "children listening to/observing elders." It is worth noting that only 3 of the 11 adult-child groups consisted of adult-child dyads—two cases of an adult and a baby and one case of an adult and an 8-year-old. The remaining cases of outdoor adult-child interaction involved adults interacting with multiple children. Again, expanding the age criteria to treat teens as adults did not substantially affect the percentages.

These findings provide a picture of children's access to adults in outdoor spaces in urban public housing. Although the vast majority of children observed were not interacting directly with an adult, and some children appeared to be left completely alone, the majority were receiving some supervision. On the whole, these findings attest that urban public housing
TABLE 2
Children’s Access to Adult Figures in Low- and High-Vegetation Spaces (N = 114 groups with children)

<table>
<thead>
<tr>
<th></th>
<th>No Access</th>
<th>Partial Access</th>
<th>Full Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low vegetation</td>
<td>67</td>
<td>31</td>
<td>33</td>
</tr>
<tr>
<td>High vegetation</td>
<td>33</td>
<td>69</td>
<td>67</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Adults and teens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low vegetation</td>
<td>78</td>
<td>26</td>
<td>35</td>
</tr>
<tr>
<td>High vegetation</td>
<td>22</td>
<td>74</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

NOTE: The values represent mean percentages of groups of children.

children have much in common with children everywhere, contrary to common fears and the media’s portrayal. Even so, a just cause for concern is the proportion of children who were not supervised; how might outdoor spaces encourage more supervision of children outdoors?

*Does vegetation influence children’s access to adults?* Do greener outdoor spaces afford children more access to adults? A chi square test indicated that groups of children in relatively green spaces had more access to adults than did groups in relatively barren spaces, $\chi^2(2) = 6.6, p < .05$. (Note that because of the low incidence of direct interaction, the “interacting” category was combined with the “full access” category for this analysis.) Table 2 shows the percentages of groups with different levels of access to adults in high- and low-vegetation spaces. Of the groups interacting with, or having full access to, an adult, the ratio in high-vegetation spaces versus low vegetation spaces was 2:1, and the same ratio was true of groups with partial access to an adult. In contrast, for every group without access to adults in a high-vegetation space, there were two such groups in low-vegetation spaces. Not presented in the table but worth noting, 7 of the 11 instances of adults and children “interacting” were observed in high-vegetation spaces.

When the definition of adult was expanded to include teens, the patterns were similar but more pronounced (see Table 2). Children had more access to adult figures in greener spaces than they did in more barren spaces, $\chi^2(2) = 7.7, p < .05$. Thus, vegetation in outdoor spaces is related to children’s access to adults regardless of whether teens are included as adults.
These findings replicate and extend the work of Coley et al. (in press). Like Coley et al., we show that adults and children are more likely to jointly occupy a space when higher levels of vegetation are present. Moreover, the finer-grained analysis here shows that children have double the access to adult attention when higher levels of vegetation are present.

IMPLICATIONS

Poverty, inadequate housing, and dangerous neighborhoods put children growing up in urban public housing at risk for a range of negative developmental outcomes. This work examined how the physical environment of public housing might ameliorate such risks by supporting activities that promote normal, healthy development. Despite the myriad of social programs provided to inner-city residents, many children are unable to keep up academically and become further entrapped in poverty. Like the work of Lewin (1931) and Wachs and Gruen (1982), we found the conditions of the physical environment to be associated with developmentally important activities—activities that may reduce the risks of growing up in urban public housing. The results of this study suggest that changing the physical environment is an additional way to promote healthy development in a population of children at the center of some of our most pressing public concerns.

The descriptive findings of this study—that the vast majority of children in outdoor spaces were involved in a rich variety of play and had some degree of supervision—address a gap in the literature. The current state of knowledge with respect to play and adult supervision among poor, urban African American children is limited. In the case of play, although there have been some observational studies, these studies have been conducted in settings, and with materials, unfamiliar to the children being studied (Rubin et al., 1983). In the case of adult supervision, parent report and child report have been the most common means of assessment, providing a valuable but limited picture of how children are actually supervised in everyday life. This study addresses these gaps in the literature in an ecologically valid manner, by examining urban public housing children in their everyday environment using resident observers. This is a first step in understanding how inner-city children naturally play and interact with adults in their everyday lives.

The vegetation findings—that there was significantly more play, more creative play, and more access to adults in high-vegetation spaces—also make a contribution. Hints in past work have indicated that vegetation may be
supportive of play and access to adults in outdoor spaces. This study provides systematic evidence that vegetation is associated with these beneficial activities. A logical next question for research is, why is vegetation associated with play and access to adults? One possibility is that the incidence of play and adult access in a given population is fixed, and providing more pleasant (greener) spaces merely causes people to relocate their activities. Another possibility is that the incidence of play and adult access in a population depends on the settings available, in which case providing spaces that are more suited to an activity can actually increase the incidence of that activity. Would an increase in the amount of outdoor spaces with nature simply spatially redistribute these important activities, or would it actually increase their occurrence? Random assignment of children to spaces or longitudinal tracking of children across spaces might help answer this question.

Although these findings pertain directly to poor urban children, they may speak to the developmental requirements of children living in other settings. Frost and Jacobs (1995) contend that most neighborhoods are less hospitable for play today than in the past, and that as both parents work outside the home and cannot chauffeur children to organized play events or parks, children are left trapped indoors with Nintendo or television. All children could benefit from nearby outdoor spaces that are attractive and supportive of developmentally important behaviors. What is needed is a clear understanding of the specific physical elements that create such outdoor spaces. It seems that vegetation, particularly trees, is one such element. We hope these findings, along with future research, will encourage city planners and designers to include more trees and grass in public housing developments. Doing so is likely to have a number of positive consequences that benefit children, their families, and their communities.

These findings provide a clear depiction of how children spend time outdoors in urban public housing. Previous research and considerable media attention has focused on the pathologies of inner-city children and youth. To the contrary, the children in this study were engaged in all the same types of play as observed in other populations and most were the object of some type of supervision. To the extent that play and access to adults were depressed, they were depressed primarily in more barren settings. These findings show that the physical environment can support activities that promote normal, healthy development and remind us that inner-city children’s pathologies may stem from the circumstances in which children grow up—not from the children themselves.
REFERENCES


