ENCYCLOPEDIA
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The Influence of Outdoor Play on Social and Cognitive Development

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Introduction

The past decade has seen a growth in evidence supporting the relationship between outdoor play and children's cognitive and social development. Recent research highlights the benefits for children's attention in academic contexts and prosocial behaviour. Longitudinal studies are starting to reveal pathways from early outdoor play experiences to prosocial behaviours and later quality of life. Evidence also indicates the benefits are greater when outdoor play occurs in contexts that include nature.

Subject

Outdoor play is often loosely defined and includes any activities children engage in when in childcare outdoor play areas, playgrounds, forests and other built or green spaces. The broad definition captures a wide range of activities. Recent efforts have been made to provide clearer coding schemes to better describe the types of activities children engage in outdoors[1]. Similarly, coding schemes have been developed to determine the extent to which outdoor play occurs in a

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natural environment.[2]

The main interest in cognition has been to determine if and how outdoor play influences executive functions and attention during group learning. Much of the work on social development has related to prosocial behaviours such as sharing, kindness and helping others. It could be argued that the focus on cognition and social development has been narrow. Nonetheless, the focus has allowed researchers to consider pathway models to understand both the short- and longer-term benefits of outdoor play[3,4].

Problems

There is increased recognition of the importance of outdoor play. For example, most health advice for young children includes recommendations for playing outdoors. Parents and early childhood educators are often seen as gatekeepers and therefore considered responsible for children's access to outdoor play[5]. Unfortunately, there are significant barriers that can be difficult for parents and early childhood educators to overcome. These include:

Risk aversion: Outdoor space, particularly outdoor space with nature, can be unpredictable and children tend to be more active and adventurous in these spaces compared to indoors[6]. Adults worry about accidents and injuries and therefore restrict access to these forms of play[7,8].

Screen time: Time spent on screens is negatively related to time spent in outdoor play[9,10]. Nonetheless, screen time is a feature of modern childhood.

Urbanisation: Most children live in highly urbanised environments. These environments often lack child-friendly or adequate outdoor spaces for children's play. When spaces exist, they may be difficult to access[11].

The impact of reductions in opportunities for unstructured outdoor play may already be apparent12 and over time has led to problems such as reduced opportunities to socialise with others8 and an increase in mental health problems.[13,14]

The majority of research has been conducted with pre-schoolers or school-aged children. Little is known about younger children.

Research Context

Outdoor play is an important context for physical activity[15]. Much of the outdoor play research is aligned with physical activity research. It is often quantitative, multidisciplinary and linked to health and/or academic outcomes. Studies include (quasi) experimental and longitudinal designs. Measures include observation and assessment using standardised tests or questionnaires[16].

Key Research Questions

Major research questions in this area include:

- What relationships exist between outdoor play and cognitive development?
- What relationships exist between outdoor play and social development?
- Do early outdoor play experiences contribute to later cognitive and social benefits?
- In what way does nature in the outdoor play environment matter?

Recent Research Results

A continuing research area involves the investigation of outdoor play and executive functions (EFs). EFs include cognitive processes such as inhibitory control, working memory and cognitive flexibility and are associated with positive academic and social outcomes.[17,18] There is evidence that aerobic exercise improves EFs[19] and this would perhaps account for the relationship with outdoor play. Significantly greater improvements in inhibitory control have been found when preschoolers physical activity is outdoors rather than indoors[20]. However aerobic exercise alone does not seem to be sufficient. The physical activity that is associated with aerobic exercise needs to be in the context of complexity, novelty and diversity to promote EFs.[21] Research on pretend play and EFs has been found to be promising[18] as has the Tools of the Mind curriculum which incorporates pretend play.[22,23] While it is reasonable to assume that outdoor play involving physical activity and pretend play would be ideal for promoting EFs, the critical studies are yet to be conducted.

Following from the physical activity literature, one study[24] has examined the impact of single episodes of outdoor play on on-task classroom behaviour. The researchers compared the same children's on-task classroom behaviour under two different conditions. The first was with outdoor play before the classroom activity. The second was with outdoor play after the classroom activity. On-task behaviour was higher in the first condition for boys and for children from lower

socioeconomic backgrounds. Of course, it is possible that any type of play before a classroom-based activity could improve attention. This was tested by comparing children's attention during classroom activities in two different conditions. The researchers used a quasi-experimental design in which teachers programmed for an hour of play before classroom activities. In the first week the play was indoors, in the second week the play was outdoors. Observations of classroom behaviours revealed children to show better attention and inhibitory control following outdoor play.

There is a growing body of evidence supporting a positive relationship between green space in children's neighbourhoods and prosocial behaviours[25]. Green spaces include parks and other natural spaces found within urban environments. Although these studies typically lack a direct measure of children's play, researchers argue that green spaces are contexts in which children can play with peers and practice prosocial behaviours[25].

Findings from the Longitudinal Study of Australian Children found children's access to green space, based on parent report was positively associated with a range of outcomes in adolescence including better mental health, enjoyment of physical activity and health related quality of life[26]. Data were collected at six timepoints, from ages 4-5 years through to 14-15 years with a sample of 4983 children. The model indicates that green spaces promote prosocial behaviours, which in turn contribute to social and cognitive developments that promote mental health.

Further evidence of the importance of green spaces comes from studies investigating the gut microbiome[27]. Recent research on gut microbiome in infancy and early childhood has shown promising evidence of a relationship between variation in gut microbiota and both cognitive and social development[28]. A randomized controlled trial (RCT) was conducted in Hong Kong to determine whether play in nature would lead to changes in gut microbiota and psychosocial behaviours of children 2-5 years[29]. The Play&Grow early education program, which has an emphasis on connectedness to nature, was the basis of the 10-week intervention. Results indicated a change in gut microbiota and a change in psychosocial behaviours. For the latter, the main change was a reduction in anger. The Play&Grow RCT provides further evidence of the importance of playing in nature. It also demonstrates that positive impacts can be found even in highly urbanised locations such as Hong Kong.

Human geographers and environmental psychologists have examined spatial understandings, in particular, how children remember and understand larger environments, such as

neighbourhoods. Studies have identified associations between active travel/independent mobility and children's spatial knowledge.[30,31] Primary school aged children have demonstrated better knowledge of home-school routes and objects encountered than children travelling in motorised vehicles. Independence of travel, way-finding and speed of travel (i.e., slow to observe details) have been considered important in developing children's spatial knowledge.[32] A qualitative study of 10-11 year olds in a Swedish community with significant green space found independent mobility involved playful experiences and included places for socialising or being alone.[33] These children also expressed awareness that their independent mobility may be threatened by increased development, particularly due to heavier traffic.

Research Gaps

While studies have included children from linguistically and culturally varied backgrounds, they are mainly from high income, highly urbanised countries. Little is known about lower- and middle-income countries.

There is potential for a wider range of cognition and social behaviour to be investigated. More research is needed in multiple contexts, such as home, childcare/school and neighbourhood.

Conclusions

There is clear evidence to recommend that children are offered opportunities for daily high-quality outdoor play. Ideally, outdoor play should involve changing conditions, such as found in nature, to encourage children to adapt and increase flexibility. It should allow for risk-taking and peer interactions. Opportunities for independent mobility appear to be important, particularly for school-aged children.

Implications for Parents, Services and Policy

Research on outdoor play and its relationship to social and cognitive development has clear implications for parents, educators/teachers and policymakers. If a child is struggling with pre-academic tasks, engaging the child in more direct instruction may seem like common sense. Yet allowing the child time to engage in high quality, unstructured outdoor play is much more likely to support their academic and social skills and support attention when engaging in academic tasks. Parents and educators/teachers may also consider children's overall screen time and the impact this may be having on outdoor play.

Policymakers can use the outdoor play evidence to consider better ways for planning neighbourhoods and supporting initiatives for child-friendly spaces, particularly green spaces. Children's social and cognitive development should be an important factor when planning for changes in urban green spaces.

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