

# Research Digest

New evidence for advancing  
the children and nature movement



## Literature Review | Equitable Access to Nature's Benefits

**November 2018**

To advance equitable access to nature for children in cities, it is important to deepen our understanding of the barriers and opportunities presented in the scholarly literature. This *Research Digest Literature Review* describes the latest academic research on children's equitable access to nature that can serve to make the case to decision makers in the areas of policy, programs and infrastructure. We draw from the Children & Nature Network's extensive [Research Library](#), which includes detailed summaries and citations of more than 800 peer-reviewed scholarly articles.

**This Literature Review highlights 28 articles published since 2015 across five areas of inquiry:**

**Disparities in Access to Nature in Urban Environments**

*describes the current state of inequities in access to nature correlated with race, income, and other factors.*

**Physical and Social/Emotional Barriers to Equitable Nature Access** *describes the barriers driving inequitable access to nature.*

**Outcomes Related to More, or Less, Equitable Access to Nature** *describes the correlation between nature access and a range of physical, social/emotional academic, and other outcomes for children.*

**Promising Strategies and Initiatives** *describes results-based evaluations of programs and policies to support children's equitable access to nature.*

**Future Research Directions** *describes a research agenda for the field to build the evidence base for results-based action supporting children's equitable access to nature.*



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## Disparities in Access to Nature in Urban Environments

**Children from communities of color and low-income communities tend to have less access to quality natural environments, experiences, and programming.**

**Access to green space and related benefits are not equitably distributed across urban populations, resulting in a widening of health gaps between socioeconomic groups**

This synthesis of research examines the links between urban green space and public health within the context of environmental justice. Results highlight the need to configure green spaces in ways that provide more equal access to the cultural ecosystem services nature provides. Doing so may prove to be an important step in improving public health and advancing the environmental justice movement. | Jennings, Larson & Yun, 2016. *Advancing sustainability through urban green space: Cultural ecosystem services, equity, and social determinants of health*. [Access Study](#)

**High-income and white people have access to significantly larger, better and safer parks than other groups**

This study used Geographic Information Systems (GIS) data and Census Bureau information to examine how access to parks in Denver, Colorado varied by household income and ethnic composition. While park proximity offers slight advantage to low-income and ethnic minority groups, there are significant inequities favoring other groups in relation to larger, safer and higher quality parks. | Rigolon, 2017. *Parks and young people: An environmental justice study of park proximity, acreage, and quality in Denver, Colorado*. [Access study](#)

## Physical & Social/Emotional Barriers to Equitable Nature Access

**The barriers experienced by people from immigrant or low-income communities or communities of color are not solely physical (such as distance to a park); they are often social and cultural and sometimes relate to discrimination.**

**Socio-economic status plays a key role in shaping children's experiences and perceptions of nature**

This literature review found that socio-economic standing of the community in which children live predicts their experiences in and perceptions of natural spaces, as well as their well-being. While children from middle-income neighborhoods tend to view nature as a space of solitude and sanctuary, children from low-income communities tend to perceive nature as a threatening place. | Adams & Savahl, 2017. *Nature as children's space: A systematic review*. [Access study](#)

**The common outdoor play concerns about safety and design of playspaces impact low-income families more than others**

This review identified a shift over time in research on children's outdoor play from a focus on safety of play environments to a wider range of concerns, including demographic factors, public space provisions, sociocultural factors, and children's independent mobility. Findings also indicate that children from low-income families have more limited access to quality outdoor play opportunities than other children. | Aziz & Said, 2017. *The trends and influential factors of children's use of outdoor environments: A review*. [Access study](#)

**Social barriers to park use by minority groups may add to already existing health disparities**

Data collected from residents of low-income neighborhoods indicate that minority groups in Minneapolis underutilize parks, are less likely to perceive parks as places providing health benefits, and face greater barriers to park use than other groups. Barriers included not feeling welcome, cultural and language restrictions, program schedule and pricing concerns. | Das, Fan & French, 2017. *Park-use behavior and perceptions by race, Hispanic origin, and immigrant status in Minneapolis, MN: Implications on park strategies for addressing health disparities*. [Access study](#)

**Social, as well as physical, barriers deter people with disabilities from using natural playspaces**

This research examined the outdoor play needs of families with children with disabilities and evaluated the usage and experiences of these families in two newly-refurbished natural playspaces. Parents identified attitudes of other people, bullying behaviors, material obstacles, and limited experience of wardens/staff in working with children with disabilities as barriers to their use of outdoor playspaces. | Horton, 2017. *Disabilities, urban natures and children's outdoor play*. [Access study](#)

## Physical & Social/Emotional Barriers to Equitable Nature Access *continued*

### **Racism plays a role in users' experience of public space**

This review focused on intercultural dynamics of public life and patterns of use within public spaces. The study found that both conviviality and racism play a role in users' experience of public space. Implications include the need to legitimize diversity of activity in the use of public space and to make improving cultural literacy and supporting social justice priorities in urban design practice. | *Rishbeth, Ganji & Vodicka, 2018. Ethnographic understandings of ethnically diverse neighborhoods to inform urban design practice.* [Access study](#)

### **Hispanic immigrant children identify family and neighborhood characteristics as barriers to outdoor play**

Fourteen Hispanic children from low-income neighborhoods shared information about why they didn't spend more time outdoors. The study was based on a concern about Hispanic children engaging in low levels of physical activity and being at an increased risk of obesity. Barriers to outside play cited by the children included safety concerns, their parents' work schedules, and lack of space. | *Taverno Ross & Francis, 2016. Physical activity perceptions, context, barriers, and facilitators from a Hispanic child's perspective.* [Access study](#)

### **Urban African American youth cite social and physical factors in their immediate environment rather than environmental exposures as threats to their health and well-being**

African American youth (both poor and non-poor) are more likely than white youth to live in high-poverty neighborhoods. Fear, anxiety, and feelings of helplessness in the face of crime keep some of these youth from spending more time outdoors. Additional concerns about their immediate physical environment relate to such factors as housing conditions, land vacancy, and community violence. | *Teixeira & Zuberi, 2016. Mapping the racial inequality in place: Using youth perceptions to identify unequal exposure to neighborhood environmental hazards.* [Access study](#)

## Outcomes Related to More, or Less, Equitable Access to Nature

**People from low-income communities or communities of color often experience worse health and educational outcomes than other groups. Access to quality natural spaces and nature-based experiences can mitigate poorer outcomes typically associated with disadvantage. Inequitable access to such spaces and experiences can contribute to widening disparities.**

### **Expectant mothers living in a low-income neighborhood with more street trees tended to have fewer preterm births than other low-income mothers**

An analysis of birth records of 100,000 infants and the maternal place of residence found a significant association between street trees surrounding the home and reduced odds of preterm birth. The lack of greenness in deprived neighborhoods also identified in this study reveals patterns of environmental injustice facing expectant mothers of lower socioeconomic status. | *Abelt & McLafferty, 2017. Green streets: Urban green and birth outcomes.* [Access study](#)

### **The prevalence of asthma in urban environments varies by race as well as social-economic status**

This review found that asthma rates are significantly higher for African American and Puerto Rican children and for children living in poverty than for other children. Both physical and social factors are likely contributors to these higher rates. Children with poorly-controlled asthma tend to be more fearful of going outside than children with well-controlled asthma. | *DePriest & Butz, 2016. Neighborhood-level factors related to asthma in children living in urban areas: An integrative literature review.* [Access study](#)

### **Hispanic children living in inner-city neighborhoods with larger and more trees report higher health-related quality of life**

Data for this study included student responses to a health-related quality of life (HRQOL) inventory, parent reports, and measures of land cover types in a predominately Hispanic inner-city section of Houston. Higher HRQOL scores were associated with larger and more trees near the children's homes. | *Kim, Lee & Sohn, 2016. Urban natural environments, obesity, and health-related quality of life among Hispanic children living in inner-city neighborhoods.* [Access study](#)

## Outcomes Related to More, or Less, Equitable Access to Nature *continued*

### **More surrounding greenness and better air quality around schools may reduce chronic absenteeism**

This study examined environmental predictors of chronic absenteeism in public schools in Massachusetts and found that greenness and air pollution influenced absenteeism almost as much as income and race. The authors suggest that adding greenness and reducing air pollution around schools might help reduce absenteeism in disadvantaged communities. | MacNaughton et al. 2017. *Impact of particulate matter exposure and surrounding “greenness” on chronic absenteeism in Massachusetts public schools.* [Access study](#)

### **The benefits of greenspace on health may vary by context and population groups**

This report presents a framework depicting potential pathways by which greenspace can benefit human health across the lifespan. The report also suggests that the benefits of green space on health may be strongest for people with low socio-economic status and those living in more deprived neighborhoods. | Markevych et al. 2017. *Exploring pathways linking greenspace to health: Theoretical and methodological guidance.* [Access study](#)

### **Access to green areas may disrupt the usual conversion of socioeconomic inequalities to inequalities in mental well-being**

An analysis of data from a large, international sample of urban residents found that socioeconomic inequality in mental well-being was narrower for people reporting better access to recreational/green areas. Additionally, the difference in mental health scores between those under most and least financial strain fell successively as access to green/recreational areas improved. | Mitchell et al. 2015. *Neighborhood environments and socioeconomic inequalities in mental well-being.* [Access study](#)

### **Environmental degradation inflicts emotional as well as physical harm on indigenous people**

This study, conducted collaboratively by an academic researcher and a Karuk Tribal member, found that the natural environment strongly influenced the Native people’s emotional experiences, which helped shape their sense of identity, their social roles, and their resistance to racism and ongoing colonialism. Their emotional response to environmental degradation included anger, shame, and grief. | Norgaard & Reed, 2017. *Emotional impacts of environmental decline: What can Native cosmologies teach sociology about emotions and environmental justice?* [Access study](#)

### **Time outdoors explains some socioeconomic prevalence differences in myopia**

Ophthalmic examination results of 5711 children from the Netherlands were paired with information about children’s daily activities, ethnicity, and factors representing family socioeconomic status and housing. Findings showed that children with myopia spent more time indoors and less time outdoors than children without myopia; children from lower socioeconomic contexts were more likely to spend time indoors. | Tideman et al. 2017. *Environmental factors explain socioeconomic prevalence differences in myopia in 6-year-old children.* [Access study](#)

### **Urban green space exposure is linked to improved human health and decreased community violence.**

This systematic review of the literature evaluated research on the association between urban green space and human health. While other reviews have examined links between nature and human health, few have focused on the urban environment, and most such reviews have been limited to cross-sectional studies. This review represents a first step toward evaluating a possible causal relationship between nature and human health in urban settings. In addition to presenting a comprehensive list of health-related outcomes in table format, the authors also devote separate sections of their paper to a discussion of nine specific areas: birth outcomes, cancer, cardiovascular, mental health, metabolic, mortality, physical activity, respiratory, and violence. They summarize their findings by noting a consistent negative association between greater urban green space exposure and decreased mortality, heart rate, and violence, and a positive association between greater urban green space exposure and increased attention, mood, and physical activity. | Kondo, M.C., Fluehr, J.M., McKeon, T., Branas, C.C., (2018). *Urban green space and its impact on human health.* [Access study.](#)



## Outcomes Related to More, or Less, Equitable Access to Nature *continued*

### **Exposure to green space early in life could result in beneficial structural changes in the brain**

This study examined the association between long-term exposure to greenspace and brain structure. The biophilia hypothesis – serving as a theoretical framework for this study – suggests that humans have evolutionary bonds to nature. This theory supports the idea that contact with nature may be essential for brain development in children, as green space exposure provides rich opportunities for children to exercise discovery, creativity and risk taking. Evidence suggests that these exercises can positively influence different aspects of brain development and cognitive functioning. The study also investigated (1) the overlap between differences in brain structure and brain regions associated with cognitive function and (2) the association between peak tissue volumes in these regions (i.e. regions associated with cognitive function) and objective measures of cognitive function. | *Dadvand, P., Pujol, J., Macia, D., Martínez-Vilavella, G, Blanco-Hinojo, L., Mortamais, M., Álvarez-Pedrerol, M., Fenoll, R., Esnaola, M., Dalmau-Bueno, A., López-Vicente, M., Basagaña, X., Jerrett, M., Nieuwenhuijsen, M., Sunyer, J., (2018). The association between lifelong greenspace exposure and 3-dimensional brain magnetic resonance imaging in Barcelona schoolchildren. [Access study.](#)*

### **Physical and social features of an urban environmental education leadership program act as affordances in promoting youth assets and critical consciousness**

This study uses narrative inquiry to explore participant experiences in an urban agriculture internship program conducted by East New York Farms! (ENYF), a food justice organization in Brooklyn, NY. The study focused on how interns viewed the program in relation to the development of critical consciousness and the development of youth assets. Critical consciousness refers to a moral awareness linked to an in-depth understanding of social and political actions in the larger world. The positive youth development approach used by ENYF assumes that all youth have the capacity to become successful adults, if given appropriate support. | *Delia, J., Krasny, M.E., (2018). Cultivating positive youth development, critical consciousness, and authentic care in urban environmental education. [Access study.](#)*

## Promising Strategies & Initiatives

**More and more health and educational interventions aimed at increasing equitable access to quality nature and nature experiences for at-risk communities are emerging. Research is beginning to document their effectiveness.**

### **Experiential learning through urban farming may promote school connectedness of at-risk students**

This case study explored student and parent experiences with a school-based urban farming program serving students in a high-poverty setting. Findings indicated that the program gave students rich opportunities to learn more about their own personal and career interests, to develop life skills, to help their families make healthier food choices, and to make positive changes in their community. | *Fifolt, Morgan & Burgess, 2017. Promoting school connectedness among minority youth through experience-based urban farming. [Access study](#)*

### **Pediatricians and families respond positively to a prescription program promoting outdoor physical activity for children**

Twenty-three physicians working with community health centers serving ethnically diverse, low-income, urban families reported positive results of an intervention program linking written prescriptions for increased physical activity with free, community-based outdoor activities. Families cited fun, free, local, and potential for weight loss as reasons for participating. | *James et al. 2017. Prescribing Outdoor Play: Outdoors Rx. [Access study](#)*

### **Green space initiatives promote health equity**

This commentary highlights several community initiatives addressing social concerns relating to inequitable access to green space and related health disparities. Natural Leaders, a part of the Children & Nature Network, is one example of an initiative addressing these concerns. Also presented in this paper is a conceptual model focusing on the relationship between green space and health equity. | *Jennings et al. 2017. Urban green space and the pursuit of health equity in parts of the United States. [Access study](#)*

## Promising Strategies & Initiatives *continued*

### **School gardens may help lessen race and class inequality in academic achievement**

This study included an assessment of student access to school gardens in Washington, D.C. according to race and income. Standardized test results were then used to examine differences between traditional and garden-based learning. Findings indicated that school gardens could help reduce the achievement gap between groups of students, especially groups defined by socioeconomic status and race. | Ray, Fisher & Fisher-Maltese, 2016. *School gardens in the city. Does environmental equity help close the achievement gap?* [Access study](#)

### **Garden-based intervention program promotes positive learning and behavioral outcomes for students disengaged from school**

This case study examined a garden-based learning program designed for students from disadvantaged communities who are on long suspension from their home schools. Positive outcomes included enhanced well-being, increased personal management and social skills, active engagement in the educational environment, improved connections with adults, and increased self-esteem. | Truong, Gray & Ward, 2016. "Sowing and growing" life skills through garden-based learning to reengage disengaged youth. [Access study](#)

### **Park prescription program shows promise of promoting behaviors and attitudes relating to health and physical activity with low-income families**

This article describes the development and evaluation of a park prescription program for low-income residents in Washington, DC. The program provides pediatric health providers with a user-friendly tool to facilitate park prescriptions for families. Evaluation results show that behaviors and attitudes relating to health and physical activity can change through a park prescription program. | Zarr, Cottrell & Merrill, 2017. *Park prescription (DC Park Rx): A new strategy to combat chronic disease in children.* [Access study](#)

### **School-based kitchen garden programs may positively influence individual, social and physical environmental factors contributing to obesity.**

This study examined student, parent, and teacher perceptions of a school-based kitchen program in New Orleans. The benefits of school-based kitchen garden programs are well-documented in the literature. There has been little research, however, on how people in low-income, minority communities perceive such programs. Understanding how school-based kitchen garden programs are perceived by stakeholder groups can be important for program sustainability and effectiveness. | Knapp, M.B., Hall, M.T., Mundorf, A.R., Partridge, K.L., Johnson, C.C., (2018). *Perceptions of school-based kitchen garden programs in low-income African American communities.* [Access study](#)

## Future Research Directions

### **This field of research is constantly growing; a 2017 paper identified key needs for future research and study.**

#### **Team of scholars develop a research agenda to further the evidence linking contact with nature and human health**

A multidisciplinary team identified seven principal domains of research and developed a research agenda to address unanswered questions relating to nature and human health. One domain focused specifically on diversity and equity considerations. Implementing this agenda is needed to guide interventions across a wide range of populations and settings. | Frumkin et al. 2017. *Nature contact and human health: A research agenda.* [Access study](#)

*This Literature Review is provided by the Cities Connecting Children to Nature (CCCN) initiative, a partnership of the National League of Cities and the Children & Nature Network, made possible with support from The JPB Foundation. CCCN helps city leaders and their partners ensure equitable opportunities for children to play, learn and grow in nature, from urban parks and community gardens to the great outdoors. Find more resources at the [CCCN Resource Hub](#).*

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