Creating Inclusive Naturalized Outdoor Play Environments

Nilda Cosco, PhD, Robin Moore, MCP, HonASLA

The Natural Learning Initiative, College of Design, North Carolina State University, USA

May 2019

Introduction

Outdoor play in naturalized environments has a positive impact on children's development[1] and physical health,[2-5] including children with disabilities. Exposure to nature may strengthen the immune system[6] help decrease attention deficit disorder symptoms;[7,8] and assist all children to improve well-being.[9] These findings suggest a strong link between inclusion and biophilia (the innate human tendency to have positive feelings towards nature), recognizing that all life forms are part of the Earth's ecosystem.[10]

Biodiversity and allergies. Contact with a variety of living organisms from all sources of nature (plants, animals, insects, bacteria) is associated with the balance of microbiota (bacterial cells living in the body) boosting the immune system that may reduce allergies.[6] Contact with environments rich in microorganisms in childhood reduces the risk of developing allergies later in life.[11]

Note of caution: Parents and caregivers should evaluate if children with disabilities with weak immune systems can interact freely with these types of environments. The issue of toxic and allergy-triggering properties of plants must be carefully considered.[12,13]

Subject

According to the *Well-being of Canada's Young Children*,[14] children under 4 years of age have a low rate of disability (boys 2.1%, girls 1.2%) as compared to older children, although the report queries the identification of disabilities this early in life.

Canada ratified the UN Convention on the Rights of Persons with Disabilities in 2010 after consultation with the provinces, territories, Aboriginal self-government entities, and the Canadian public. The Indigenous Persons with Disabilities Global Network invites policy makers to "apply a rights-based framework to addressing the

need of First Nations persons with disabilities"[15] Coupled with the child's right to play (Article 31, UN Convention on the Rights of the Child)[16] all children (with and without disabilities) are recognized as full persons and are fully protected.

Based on these considerations, carefully designed natural environments can help maintain the balance necessary for the healthy growth and enjoyment of all children.[17] Nature presents the child with all life's facets: birth, growth, end of life, and metamorphosis. Observing small critters such as butterflies, amphibians, and birds can be life affirming. Cycles of life offer clear messages of hope and recovery for those suffering illnesses. The drama of meteorological phenomena (thunder, wind, rain) compels humans of all ages to re-dimension their finite human strengths in relation to the power of nature.[18]

Problems

Although play is essential for healthy child development and contact with nature is a health promotion factor, children (especially those with disabilities) do not spend enough time outdoors, neither do they find high quality, age / skill appropriate play areas easily accessible.[19,20] The need for daily outdoor play in inclusive settings should be ensured by state-of-the-art environments located where children spend most of their time that offer healthy risk opportunities.[21,22]

Research Context

Beyond the concept of accessibility, universal design— "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design"[23] is an inclusive concept that addresses the needs of all users. The concept of universal design includes children whose freedom may be constrained by environmental barriers, which they are unable to influence or redesign. However, historically most attention has been given to issues related to adult accessibility (including ageing) and to those with physical disabilities.[24]

Most topical research has been carried out using surveys and purposeful sampling (e.g., children and families attending municipal programs). Findings are relevant but of weak value for generalization.[25] Systematic research studies on the topic are needed, including larger samples under experimental, controlled conditions.

Key Research Questions

Current research questions address the need of professionals and parents looking for evidence-based guidance to create stimulating, age / skill appropriate play environments for children. They include demand for information on built environment characteristics relevant to children with differing abilities such as autism spectrum, sensory impairments, cognitive and behavioral problems, chronic diseases, and allergies. Relevant findings are needed to guide development of innovative design guidelines, municipal codes, and early childhood education policies.

Awareness of the importance of children's contact with nature has increased requests for evidence-based design of naturalized play environments. As they appear on the ground, parents are inquiring about risks and benefits of such places and providers are raising concerns about safety and exposure to liability.[26,27]

Recent Research Results

The concepts of accessibility, usability, and social interactions in play areas appear repeatedly in the latest inclusive playground studies.[28,29] Based on the concept of affordance,[30] which shows that characteristics of the environment influence behaviour, it is possible to identify and analyse similarities and differences in children's play behaviours among activity settings (e.g., manufactured play equipment compared to sand play areas, pathways, or natural settings). Research findings include:

Barriers to inclusive outdoor play:

- Inappropriate ground covers and inaccessible play equipment render it difficult for children to access and use equipment and play spaces.[25,26,31]
- Ground level components lacking diversity can reduce children's interest in play.[29]
- Highly concerned caregivers preventing children from engaging in exploratory play.[32,33]
- Planners, designers, and policy makers' insufficient knowledge about children's needs especially across developmental stages can make it difficult to develop play spaces and policies that adequately support children.[24,25,34]
- Exposure to uncomfortable weather elements (sun, wind, temperature, precipitation) may influence frequency of use.[24]
- Lack of engaging children in participatory design processes may result in inadequate play spaces.[35]

Positive aspects:

- Natural landscapes offer comfort and stimulation for children with disabilities and their companions.[24]
- Able-bodied children can play alongside peers and siblings with disabilities when diverse ground level play opportunities are available.[24,31]
- Sensory stimulation (touch, sight, sound, fragrances, vestibular) supports multiple learning abilities, sustains interest, and promotes repeat visits.[24]
- Outdoor cooperative activities can foster learning opportunities and positive social behaviours.[36]
- Play in parks supports social inclusion and joyful family time.[20,28]
- Contact with nature supports the immune system.[6,37]

Research Gaps

Research gaps include the need for studies addressing both benefits and detrimental aspects for children with disabilities interacting with naturalized environments. Aspects include potential allergies; sun exposure; special provisions for children with mental, cognitive, sensory disabilities; chronic illness; developmental and behavioral problems; dose-response to natural environment exposure; appropriate types of play components and related risk management strategies; analysis of regulations / legislation supporting evidence-based outdoor play provisions for children with disabilities; and evidence-based universal / inclusive design guidelines.[38]

Conclusions

For most children, including children with disabilities, outdoor play in naturalized environments has a salutogenic impact. Healthy environments (free of pollution, age appropriate, and with sufficient diversity to stimulate play for all ages and skills) encourage caregivers to extend time outdoors, engage children via ever changing nature / weather conditions, support social interactions and joyful family moments and, therefore, support child quality of life. Research on gaps and emerging topics may offer tools to create evidence-based design solutions, risk benefit assessments, and environmental management and programming guidance for naturalized, inclusive, outdoor environments. Participatory design processes (including children of all abilities, parents, caregivers, and community representatives), conducted by knowledgeable designers, using evidence-based indicators and tools, may ensure innovation and address the needs of young children to explore the places where they spend most of their time.

Implications for Parents, Services and Policy

Rich naturalized environments can encourage children to explore the world around them. Children with disabilities enjoy interacting socially with peers and others, exploring their surroundings, and experiencing stimulating, ever changing environments with degrees of freedom related to their own skills.

Parents

Parents should be informed of the fact that research addressing the benefits of outdoor play in naturalized environments supports the claim that most children benefit from experiences in nature. Access to reliable information about the benefits of inclusive environments for children is key. As awareness grows, the desire to protect children may become an obstacle for young children with disabilities wanting access to rich experiences. Playgrounds can be designed as special, comfortable places full of engaging choices for children of all abilities, supporting engagement in active and imaginative play.

Services

Providers and services using the latest translated research findings could create or access existing educational resources to disseminate information to parents and create awareness for general audiences. Parks and recreation, school systems, early childhood education services and interested organizations are critical to support system change and popularize the creation of naturalized inclusive play areas.

Policy

Policy makers should support research into inclusive naturalized play environments and develop evidence-

based solutions to infuse innovation into regulations and policies for early childhood inclusive environments. Innovative policies should call for universally designed, naturalized play areas for daily use.[39]

References

1. Hewes J. Let the children play: Nature's answer to early learning. Lessons in Learning. Canadian Council on Learning. 2006.
2. Finn K, Johannsen N, Specker B. Factors Associated with Physical Activity in Preschool Children. *The Journal of Pediatrics*. 2002;140(1):81-85.
3. Dyment J, O'Connell TS. The impact of playground design on play choices and behaviors of pre-school children. *Children's Geographies*. 2013;11(3):263-280. doi:10.1080/14733285.2013.812272
4. Rose KA, Morgan IG, Kifley A, Huynh S, Smith W, Mitchell P. Outdoor activity reduces the prevalence of myopia in children. *Ophthalmology*. 2008;115(8):1279-1285.
5. Wu P-C, Chen C-T, Lin K-K, et al. Myopia Prevention and Outdoor Light Intensity in a School-Based Cluster Randomized Trial. *Ophthalmology*. 2018;125(8):1239-1250. doi:10.1016/j.ophtha.2017.12.011
6. Haahtela T, Holgate S, Pawankar R, et al. The biodiversity hypothesis and allergic disease: World Allergy Organization position statement. *World Allergy Organization Journal*. 2013;6:5(Position article and guidelines).
7. Taylor AF, Kuo FM, Sullivan W. Coping with ADD: The Surprising Connecting to Green Play Settings. *Environment and Behavior*. 2001;33(1):54.
8. Taylor AF, Kuo FM. Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders*. 2009;12(5):402-409.
9. Louv R. All children need nature: 12 questions about equity and capacity. The New Nature Movement. https://www.childrenandnature.org/2018/01/16/all-children-need-nature-12-questions-about-equity-capacity/. Published January 16, 2018. Accessed April 29, 2019.
10. Wilson EO. Biophilia: The human bond with other species. Cambridge: Harvard Univeristy Press; 1984.
11. Ruokolainen L, von Hertzen L, Fyhrquist N, et al. Green areas around homes reduce atopic sensitization in children. *Allergy*. 2015;70(2):195-202. doi:10.1111/all.12545
12. Huntington L. Creating a low-allergen garden. London: Mitchell Beazley; 1998.
13. Moore R. Plants for play: a plant selection guide for children's outdoor environments. Berkeley, CA: MIG Communications; 1993.
14. Canada. The Well Being of Canada's Young Children: Government of Canada Report 2011. SP-1027-04-12E. Chapter 9: What do we know about young children with disabilities in Canada? (p.77-81). http://www.dpe-agje-ecd-elcc.ca/eng/ecd/well-being/sp_1027_04_12_eng.pdf. Published 2011. Accessed April 29, 2019.
15. First Nations and First Nations Persons with Disabilities Engagement on Federal Accessibility Legislation: Report. Assembly of First Nations (AFN). 2017.
16. World Conference on Human Rights. The rights of the child. Paper presented at the World Conference on Human Rights, Vienna. June 25, 1993.
17. Greenman J. Caring spaces, learning places: Children's environments that work. Lincoln, NE: Exchange Press; 2017.
18. Cosco N, Moore R. Playing in Place: Why the physical environment is important in playwork. Paper presented at the 14 th. PlayEducation Annual Play and Human Development Meeting: Theoretical Playwork. January 26-27, 1999.
19. Keeton VF, Kennedy C. Update on physical activity including special needs populations. *Current Opinion in Pediatrics*. 2009;21(2):262-268. doi:10.1097/MOP.0b013e3283292614
20. Horton J. Disabilities, urban natures and children's outdoor play. *Social & Cultural Geography*. 2017;18(8):1152-1174. doi:10.1080/14649365.2016.1245772
21. Moor R, Goltsman S, Iacofano D. Play for all guidelines. 2nd ed. Berkeley, CA: MIG Communications; 1992.
22. Bundy AC, Wyver S, Beetham KS, et al. The Sydney playground project--levelling the playing field: a cluster trial of a primary school-based intervention aiming to promote manageable risk-taking in children with disability. *BMC Public Health*. 2015;15:1125-1125. doi:10.1186/s12889-015-2452-4
23. Ostroff E. Universal Design: The new paradigm. In: Preiser W, Ostroff E, eds. *Universal design Handbook*. New York: McGraw Hill; 2001:1.3-1.12.

24. Moore R, Cosco N. What makes a park inclusive and universally designed? A multi-method approach. In: Ward Thompson C, Travlou P, eds. *Open Space People Space*. London: Taylor and Francis; 2007:85-110.

25. Prellwitz M, Tamm M, Lindqvist R. Are playgrounds in Norrland (Northern Sweden) accessible to children with restricted mobility? *Scandinavian Journal of Disability Research.* 2001;3(1):56-68. doi:10.1080/15017410109510768

26. Ball D. Policy issues and risk–benefit trade-offs of 'safer surfacing' for children's playgrounds. *Accident Analysis and Prevention.* 2004;36(4):661-670.

27. Brussoni M, Ishikawa T, Brunelle S, Herrington S. Landscapes for play: Effects of an intervention to promote nature-based risky play in early childhood centres. *Environmental Psychology.* 2017;(54):139-150.

28. Burke J. Just for the fun of it: making playgrounds accessible to all children. *World Leisure Journal.* 2013;55(1):83-95.

29. Moore A, Lynch H. Accessibility and usability of playground environments for children under 12: A scoping review. *Scandinavian Journal of Occupational Therapy*. 2015;22(5):331-344. doi:10.3109/11038128.2015.1049549

30. Gibson E, Pick A. *An ecological approach to perceptual learning and development.* New York: Oxford University Press; 2000.

31. Fernelius C, Christensen K. Systematic review of evidence-based practices for inclusive playground design. *Children, Youth and Environments*. 2017;27(3):78-102. doi:10.7721/chilyoutenvi.27.3.0078

32. Talay L, Akpinar N, Belkayali N. Barriers to playground use for children with disabilities: A case from Ankara, Turkey. *African Journal of Agricultural Research*. 2010;5(9):848-855.

33. Brussoni M, Olsen LL, Pike I, Sleet DA. Risky play and children's safety: Balancing priorities for optimal child development. *International Journal of Environmental Research and Public Health.* 2012;9(9):3134.

34. Olsen HM, Dieser RB. "I am hoping you can point me in the right direction regarding playground accessibility": a case study of a community which lacked social policy toward playground accessibility. *World Leisure Journal.* 2012;54(3):269-279. doi:10.1080/04419057.2012.702456

35. Wooley H. Now being social: The barrier of designing outdoor play spaces for disabled children. *Children & Society*. 2013;27(6):448-458. doi:10.1111/j.1099-0860.2012.00464.x

36. Nabors L, Willoughby J, Leff S, McMenamin S. Promoting inclusion for young children with special needs on playgrounds. *Journal of Developmental and Physical Disabilities.* 2001;13(2):170-190.

37. Gensollen T, Iyer SS, Kasper DL, Blumberg RS. How colonization by microbiota in early life shapes the immune system. *Science*. 2016;352(6285):539-544. doi:10.1126/science.aad9378

38. Cosco N. Developing evidence-based design: environmental interventions for healthy development of young children in the outdoors. In: Ward Thompson C, Travlou P, eds. *Open Space People Space*. London: Taylor and Francis; 2007:125-135.

39. Lynch H, Moore A, Prellwitz M. From policy to play provision: Universal design and the challenges of inclusive play. *Children, Youth and Environments.* 2018;28(2):12-34. doi:10.7721/chilyoutenvi.28.2.0012