



Outdoor play

Last update: May 2019

Topic Editor:

Mariana Brussoni, PhD, The University of British Columbia, Canada

Table of content

Synthesis	5
<hr/>	
Building Capacity to Support Outdoor Play in Early Childhood Education	8
¹ BEVERLIE DIETZE, PHD, ² DIANE KASHIN, EDD, MAY 2019	
<hr/>	
Designing Cities for Outdoor Play	14
TIM GILL BA, MA, MAY 2019	
<hr/>	
Active Outdoor Play	20
VALERIE CARSON, PHD, MADISON PREDY, BKin, MAY 2019	
<hr/>	
Outdoor Risky Play	27
¹ ELLEN BEATE HANSEN SANDSETER, PHD, ² RASMUS KLEPPE, PHD, MAY 2019	
<hr/>	
Young Children's Outdoor Play-Based Learning	34
JANE WATERS, PHD, ANGIE REKERS, PHD STUDENT, MAY 2019	
<hr/>	
The Influence of Outdoor Play on Social and Cognitive Development	42
SHIRLEY WYVER, PHD, MAY 2019	
<hr/>	
Creating Inclusive Naturalized Outdoor Play Environments	48
NILDA COSCO, PHD, ROBIN MOORE, MCP, HONASLA, MAY 2019	
<hr/>	
Early Childhood Outdoor Play and Learning Spaces (ECOPALS): Achieving Design Quality	55
ROBIN MOORE, MCP, HONASLA, NILDA COSCO, PHD, MAY 2019	
<hr/>	
Topic Commentary: Why Outdoor Play?	62
MARIANA BRUSSONI, PHD, MAY 2019	
<hr/>	

Topic funded by:

LAWSON
FOUNDATION

Synthesis

How important is it?

Outdoor play is increasingly recognized as a foundation for children's healthy development. Children are hard-wired to need nature and to play in their natural environments. Research shows that unstructured play that takes place outdoors is vital to children's social, emotional, cognitive and physical development.

Yet it seems that in recent decades, children have been playing outside less and less. Compared to the 1970s, children today are spending fifty percent less time engaged in outdoor play. Caregiver concerns around children's safety may be one of the biggest barriers to outdoor play. Other factors include the growing presence of screen time in children's lives, as well as hurried, overscheduled and academically focused lifestyles. Some research suggests that this reduction in opportunities for unstructured outdoor play may already be responsible for declines in creative thinking, reduced ability to get along with others and increased mental disorders.

Discussions about the place of the outdoors as a site for young children's play and learning are now commonplace in reports and publications worldwide. There is also a growing desire among parents and educators to re-engage children with nature.

What do we know?

Studies have found that when children play outdoors, they are more physically active than when they play indoors. Beyond the well-known health benefits of physical activity, research has found that outdoor play and access to green space is associated with higher vitamin D levels, improved mental well-being, better attention behaviours, better self-regulation, and improved spatial memory.

Natural environments provide children with more challenge and stress-buffering conditions. Evidence suggests that repeated exposure to high-quality, unstructured outdoor play opportunities has a positive impact on social and cognitive development, including executive functions. This refers to thinking processes such as inhibitory control, working memory and cognitive flexibility. Children's outdoor play experience in the early years is linked to later

academic performance. Playing outside is important for children with disabilities, too. Natural landscapes offer comfort and stimulation. Moreover, contact with a variety of living organisms (plants, animals, insects, bacteria) helps to boost the immune system and may reduce the development of allergies. Exposure to nature may also decrease symptoms of attention deficit disorder. Outdoor play is also linked to greater environmental awareness and connections with nature, and the development of environmental stewardship. Conversely, a lack of outdoor play may undermine children's concerns for the wider environment.

Despite the benefits of outdoor play, parents around the world report that children today play outside less than previous generations. Children's access to outdoor spaces may be increasingly limited by risk aversion—a perception that children lack competency to engage with the world alone and are in danger when outside. The general trend is a decrease in children's opportunities for risk-taking in play. Yet play appears to be an ideal context to develop the ability to handle risk; children who engage in outdoor risky play learn to assess risk in a more accurate way. Evidence also suggests that allowing children a certain level of autonomy strengthens their self-awareness and ability to self-regulate. This can reduce the likelihood of anxiety, both in childhood and later in life.

What can be done?

Parents, early childhood educators and other caregivers are the gatekeepers for outdoor play opportunities in early childhood. They should aim to strike balance with scheduled activities, screen time and free time. When working with families, health care professionals should promote outdoor play across settings and weather conditions. Children should be given opportunities outdoors where they can explore the world around them, challenge themselves physically and play with others. Caregivers should try to avoid over-surveillance, which may prevent children from learning to negotiate risk and gaining physical competence.

Ideally, outdoor play should involve changing conditions, like those found in nature, to encourage children to adapt and become flexible. Some educational environments have introduced “loose parts play” onto the playground—large objects with no obvious play purpose. Versatile, complex and flexible play environments can accommodate children's diverse interests, varied competency and risk tolerance. New models of early childhood outdoor space have emerged in response to the obesity crisis and the children and nature movement. Recommended designs involve flowing and looping pathways, portable and loose part components (wheeled toys, balls and sticks), shade

trees and lots of nature.

Because children spend a large part of their time in childcare settings, improved policies may be one way to ensure that young children get more outdoor time. For example, in Canada, while all provincial regulatory bodies mandate daily outdoor play if weather conditions are appropriate, only two provinces specify the frequency or duration. Early learning educators need support to understand their role in outdoor play supervision. Currently, there is a lack of formal education and professional development related to outdoor play. A more cohesive approach to developing and implementing policies, procedures and curriculum as they relate to outdoor play would help to better promote the value of outdoor play. Indigenous philosophies and research may offer a more holistic, balanced approach to developing practices, programs and policies that impact children's growth and development in outdoor play. When time spent in nature is part of everyday living and learning, it becomes a wide-ranging and inclusive experience.

Finally, neighbourhood planning and design is important. Low traffic volumes, fewer intersections, greenness and access to a private yard are all linked to higher levels of outdoor play. Key levers for change are at the municipal level, where such decisions are usually made. Naturalized play areas should also be inclusive, so that children with disabilities and their able-bodied peers and siblings can play together.

Building Capacity to Support Outdoor Play in Early Childhood Education

¹Beverlie Dietze, PhD, ²Diane Kashin, EdD

¹Okanagan College, Kelowna, BC, Canada, ²Algonquin College, Ottawa, Ontario, Canada

May 2019

Introduction

Children's play experiences in outdoor environments are becoming increasingly recognized as essential for their healthy development.^{1,2,3,4} However, children today, compared to the 1970s, are spending 50% less time engaged in outdoor play.⁵ Reversing the indoor trend of childhood is important to children. Governments responsible for early learning programs have a variety of policies, funding levels, regulatory structures, workforce competencies, and expectations including curriculum frameworks intended to support quality play-based programs for children and families.⁶ Curriculum frameworks offer pedagogical approaches⁷ that guide the design and execution of experiences to build upon children's curiosity, exploration, thinking, and learning in indoor and outdoor environments. However, this does not mean that outdoor play is explicit in policies and frameworks. Early learning teachers do not focus enough on outdoor play, due in part, to a lack of accessible training on outdoor play pedagogy.

With researchers such as Pacini-Ketchabaw & Nxumalo⁸ and Shanker⁹ identifying a correlation between children's outdoor play experiences during their early years with later academic performance and others identifying the connection between outdoor play and the development of environmental stewardship,^{1,10,11} there is an urgent need to emphasize outdoor play in policies and early learning teacher preparation.¹² Curriculum frameworks and in turn government policies, funding levels, regulatory structures, workforce competencies and expectations need to emphasize its importance.⁷

Subject relevance

Play that occurs in outdoor environments is increasingly recognized as a foundation for children's healthy development.¹ Ideally, early learning curriculum should embody outdoor play, as it is vital to children's social, emotional, cognitive, and physical development and their learning.⁵ Children

are hard-wired to need nature and to play in their natural environments.¹³

The outdoor play experiences extended to children are influenced by the pedagogical interactions exchanged between the early learning teachers and children.¹⁴ Early learning teachers require support to understand their role in outdoor play provision.

Problem

The knowledge, skills, and practices that early learning teachers bring to their workplace are important factors in determining the strengths and gaps in knowledge, that if addressed would enhance the outdoor play experiences of children in early learning programs.¹⁵ In Canada, this is challenging because of the varying provincial and territorial government policies and departments that guide early learning programs, post-secondary programs, and the differing provincial and territorial professional development requirements of early learning teachers. For example, specific competencies delivered in college early childhood education programs may be at the discretion of professors, programs or institutions rather than defined by government policy.¹⁶ Some critics suggest the coursework may not necessarily be based on latest research nor is there guarantee that the practice-based learning is connected to the theory presented.¹⁷

Research Context

Play has long been identified as the way children learn best.^{6,7,18} Yet, with the varying educational levels and backgrounds of early learning teachers, compounded with diverse guidelines and standards for children's daily access to outdoor play, this knowledge may not be explicit in practice. Professional development is highly influenced by employers, provincial funding models, and individual early learning teacher motivation, which adds to the problem.¹⁹ There is limited peer-reviewed research that provides insight into the depth and breadth of early learning teachers' outdoor play pedagogy or competencies in planning or implementing intriguing outdoor play experiences with children, or their receptivity and attitudes toward outdoor play. This area is of importance as their pedagogical approach to outdoor play influences children's outdoor play time, experiences, opportunities and attitudes toward outdoor play.²⁰

Key Research Questions

What is the impact of the lack of formal education and professional development related to outdoor play on the practice of early learning teachers? What are the barriers to overcome to

change the practice and therefore, to increase children's access to outdoor play? Exploring the voices of early learning teachers engaged in discussions in an on-line outdoor play and nature pedagogy course, the authors examined data related to early learning teachers' practices. In the narratives shared, the barriers reveal a need to emphasize pre and post service training to early learning teachers on outdoor play.²¹

Recent Research Results

The research results provide insight into how early learning teachers describe their educational preparation for outdoor play pedagogy and practice. Eight hundred and ninety-six early learning teachers who enrolled in a professional development course on outdoor play were asked at the onset of the course to identify how they would assess their knowledge and skills related to outdoor play. Seventy-two percent of the respondents indicated that they had limited knowledge about outdoor play theory or how to implement outdoor play pedagogy in early learning programs. Eighty-nine percent of the individuals indicated that this course was their first exposure to studying outdoor play pedagogy, while 11% indicated that they acquired their knowledge through workshops.²¹

Another study explored whether the current nature-based learning and forest and nature school movements were influencing programs or practice. A movement is characterized by a group of people who collectively work together to advance their shared ideas intended to bring about change to a social issue, such as outdoor play. Across Canada, the growing interest in outdoor play has resulted in the growth of these movements designed to provide more outdoor play experiences for children.¹ Of the 212 early learning teachers who participated, 61% of the respondents identified that these movements were not influencing their practice. Many participants suggested that their childhood experiences were more influential than these movements. More than 20% of the participants indicated that the attitudes of their fellow teachers determined how outdoor play was positioned within their programs. The lack of outdoor play space and materials were noted as contributing to early learning teachers not wanting to be outdoors. More than half of the respondents identified the need to support families in understanding the benefits to children in having access to and opportunities for daily outdoor play. These findings support the debates about how early learning teachers' competencies are influenced by exposure to outdoor play pedagogy both in their formal schooling and as part of their professional development options.²²

Currently, a third study is being conducted examining 98 Canadian publicly-funded college early childhood education programs for calendar descriptions of courses on outdoor play or for explicit content related to outdoor play within other courses. Three have explicit courses and 39 identified outdoor play in descriptions leaving more than half without reference to this important curriculum area for early learning teachers. The extreme diversity among college programs combined with differing provincial and territorial policies and regulations for outdoor play raises the question if these are obstacles in advancing children's access to quality outdoor play experiences.

Research Gaps

The research needed to support advancing children's outdoor play is multifaceted due in part to the various government and territorial departments and jurisdictions that influence early learning programs. Research is needed that examines how leaders of early learning environments position outdoor play in their policies, practices, staff professional development, family orientation, and family education. Further research is required to determine the depth and breadth of outdoor play pedagogy being implemented in college programs. Ideally, a participatory research approach would be utilized to investigate the interactions among government policies and post-secondary curriculum. This approach would create synergies and gaps in theories and approaches.

Conclusion

This article identifies that across Canada there are various provincial and territorial jurisdictions responsible for the development and implementation of policies, procedures, and curriculum in publicly funded post-secondary early childhood education programs that influence children's outdoor play experiences. Without a cohesive approach to the development and implementation of policies, procedures, and post-secondary curriculum, as it relates to outdoor play and pedagogy, the opportunities for children to be in outdoor play environments that honours their right to play is diminished. Co-constructing policies, procedures, curriculum and action plans has the potential to 'raise the bar' in promoting the value and influence of outdoor play and pedagogy in children's development and thus contributing to establishing healthy communities.

Implications for Parents, Services and Policy

With expansion of services and corresponding policies that support outdoor play, early learning programs, post-secondary institutions and governments can increase children's access to environments that contribute to the developmental benefits that outdoor play has to offer. As

families become more aware of the importance of outdoor play to children's healthy development and later academic success, they can become informed consumers and advocates for their children. Change to the current state of outdoor play requires engagement among families, government, community, administrators and early learning teachers in early learning programs. Working collaboratively can inform key stakeholders to bring the knowledge and skills from research and theory to practice in support of children's outdoor play experiences.

References

1. Dietze B, Kashin D. *Outdoor and nature play in early childhood education*. Toronto: Pearson Canada; 2019.
2. Dietze B, Kashin D. *Playing and learning in early childhood education*. Toronto: Pearson Canada; 2019.
3. Leggett N, Newman L. Play: Challenging educators' beliefs about play in the indoor and outdoor environment. *Australasian Journal of Early Childhood*. 2017;42(1):24.
4. Torkar G, Rejc A. Children's play and physical activity in traditional and forest (natural) playgrounds. *International Journal of Educational Methodology*. 2017;3(1):25-30.
5. Chiao J, Li S, Seligman R, Turner R, eds. *The Oxford handbook of cultural neuroscience*. New York, NY: Oxford University Press; 2016.
6. Bassok D, Magouirk P, Markowitz A.J, Player D. Are there differences in parents' preferences and search processes across preschool types? *Evidence from Louisiana. Early Childhood Research Quarterly*. 2018;44:43-54.
7. Stabback P. *What makes a quality curriculum? Current critical issues in curriculum and learning*. United Nations Educational, Scientific and Cultural Organization. 2016:1-41.
8. Pacini-Ketchabaw V, Nxumalo F. Unruly raccoons and troubled educators: Nature/culture divides in a childcare centre. *Environmental Humanities*. 2016;7(1):151-168.
9. Shanker S. *Self-reg: How to help your child (and you) break the stress cycle and successfully engage with life*. Toronto, Ontario: Penguin; 2016.
10. Connors M, Morris, P. Comparing state policy approaches to early care and education quality: A multidimensional assessment of quality rating and improvement systems and child care licensing regulations. *Early Childhood Research Quarterly*. 2015;30:266-279.
11. Talan TN, Bloom, PJ. *Business Administration Scale for Family Child Care (BAS)*. New York, NY; Teachers College Press: 2018.
12. Li J, Hestenes L, Wang Y. Links between preschool children's social skills and observed pretend play in outdoor childcare environments. *Early Childhood Education Journal*. 2016;44(1):61-68.
13. Smirnova E, Riabkova, I. Psychological features of the narrative-based play of preschoolers today. *Journal of Russian & East European Psychology*. 2018;53(2):40-55.
14. Wall S, Litjens I, Taguma M. Early childhood education and care pedagogy review: England. <https://www.oecd.org/education/early-childhood-education-and-care-pedagogy-review-england.pdf>. Published 2015. Accessed January 17, 2019.
15. Sheridan S, Edwards C, Marvin C, Knoche, L. Professional development in early childhood programs: process issues and research needs. *Early Education and Development*. 2009;20(3):377-401.
16. Phillips D, Austin L, Whitebook M. The early care and education workforce. *The Future of Children*. 2016;26(2):139-158.

17. Martin C, Drasgow E, Halle J. Training teachers to enhance the play skills of young children with developmental disabilities during outdoor time by embedding instructional interactions. *Journal of Early Intervention*. 2015;37(4):247-269.
18. Waters J, Rekers A. Young Children's Outdoor Play-Based Learning. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/young-childrens-outdoor-play-based-learning>. Published May 2019. Accessed May 2, 2019.
19. Becker D, Grist C, Caudle L, Watson M. Complex physical activities, outdoor play, and school readiness among preschoolers. *Global Education Review*. 2018;5(2):110-122.
20. Tandon P, Walters K, Igoe B, Payne E, Johnaon D. Physical activity practices, policies and environments in Washington state child care settings: results of a statewide survey. *Maternal and Child Health Journal*. 2017;21(3):571-582.
21. Dietze B, Kashin D. Perceptions early learning teachers have about outdoor play and nature. *Learning Landscapes Journal*. In press.
22. Royer N, Moreau C. A survey of canadian early childhood educators' psychological wellbeing at work. *Early Childhood Education Journal*. 2016;44(2):135-146.

Designing Cities for Outdoor Play

Tim Gill BA, MA

Independent Researcher, United Kingdom

May 2019

Introduction and Subject

Children's right to play is enshrined in international conventions.¹ Moreover, the importance of outdoor play for children's health and well-being is well established.²⁻⁵ Yet around the world, opportunities for outdoor play are declining.⁶

This chapter reviews evidence and arguments on the relationship between children's outdoor play and urban planning and design. It focuses on 'neighbourhood built environment attributes'⁷ such as yards, housing typologies, streets and public open spaces, and how these are arranged in residential neighbourhoods, rather than just playgrounds (the most obvious built environment intervention).

This review does not examine design features within play spaces (e.g., landscaping, play equipment) as this topic is covered elsewhere.⁸ It also does not examine toxic or hazardous environmental features. Finally, it does not examine social, cultural and economic factors (which may have a greater influence on children's outdoor play experiences than built environment factors⁷).

Problems

Poor outdoor play opportunities have health and well-being consequences for children.^{4,5} Families, communities and wider society also have much to lose. What is more, outdoor play is linked to greater environmental awareness and connections with nature⁹ and to adult use of public space.¹⁰ This suggests that a lack of outdoor play may undermine children's concern for the wider environment, and lead to lower levels of engagement with their community.¹¹

Despite this, in most cities, planning and design decisions take limited account of their impact on children.^{12,13} The challenges are greater in low and middle income country contexts due to rapid, often unplanned growth.^{14,15}

Research Context

The evidence base on the influence of neighbourhood-built environment features on outdoor play is slim. Two systematic reviews found 51 relevant quantitative studies.^{7,16} However, only a minority of these use robust methodologies. Moreover, the studies are highly heterogeneous, including a diverse set of interventions, population groups, urban contexts, and outcome measures. Outcome data are often based on parental responses rather than more direct measures, leading to a risk of bias. Many studies focus on physical activity, rather than on outdoor play (although in street and public space contexts, physical activity levels may serve as a reasonable proxy indicator for outdoor play activity).

Key Research Questions

The central question for research is how the planning and design of neighbourhood housing, streets and public spaces shape children's play opportunities. Given the growth of cities worldwide, one priority for research should be informing the master planning of new residential developments. Economic, cultural and geographical contexts need to be explored, as well as issues for children and families of different ages, abilities and backgrounds.

Planning and design factors that could be studied include:

- Neighbourhood population density;
- Size, distribution and accessibility of parks, playgrounds and other public open spaces;
- Proximity and ease of access to local services and facilities including schools, childcare, shopping and health services;
- Housing densities, typologies and tenure patterns;
- Access to private and semi-private outdoor space;
- The relationship between housing and the surrounding public realm;
- Design and layout of walking and cycling paths and networks;
- Traffic flows and speeds;
- Street grid patterns;
- Street designs, including traffic calming and other street features;

- Detailed design features of public open spaces.

Recent Research Results

Low traffic volumes, fewer intersections, neighbourhood greenness and access to a private yard are all linked to greater levels of outdoor play. Features including pedestrian infrastructure and traffic calming are linked to greater levels of outdoor play in girls, but not boys. More limited evidence suggests that low residential density, living in rented/public housing, not living in an apartment and higher physical disorder are linked with greater outdoor play.⁷

Perhaps surprisingly, evidence is mixed on the importance of public open space. Two reviews have found no effect on outdoor play.^{7,16} However, reviews with an explicit focus on physical activity (rather than outdoor play) have reached different conclusions.^{17,18}

One further noteworthy observational study of newly-built English suburban housing developments suggests that residential urban design features including direct, traffic-free access from homes to green spaces, good oversight of outdoor space and good walking networks are all associated with a greater presence of people, including children playing, in public open space.¹⁰

Research Gaps

The empirical research literature is not only heterogeneous; it also shows significant gaps. As already noted, few studies use robust intervention methodologies, limiting the scope for making claims of cause and effect. Further research clarifying the importance of public open space would be particularly helpful, as the existing evidence is contradictory.

While some findings do distinguish between girls and boys, and some between different forms of housing tenure, little is understood about the influence of socio-economic or ethnic/cultural background.

A broader age focus is needed; only a handful of studies included in the literature reviews encompass children under three. Likewise, more research is needed on low and middle income country contexts.^{7,16} Globally, this is where the urban child population is set to grow the most.¹⁴

Research could help to explore long-term trends. Studies in several countries show generational declines in children's independent mobility and 'roaming range',¹⁹ which is linked to outdoor play.⁷

What is more, levels of physical activity in childhood may influence activity patterns later in life.^{20,21}

Finally, children's levels of physical activity are influenced by parental factors.^{22,23} This raises the prospect of spiralling declines in outdoor play as adults with limited experiences of outdoor play become parents.

An authoritative review of qualitative studies and grey literature would be helpful, to add to the quantitative evidence base and shed light on possible causal mechanisms.

Finally, up-to-date studies are needed to explore the rapidly growing role of technology on children's lives,²⁴ which is likely to influence their outdoor play.²⁵

Conclusions

Given the limitations of the literature, the conclusions offered here are contingent. However, empirical research suggests that residential built environment features do have an impact on outdoor play. The most robust finding is that play-friendly neighbourhoods are ones that are not dominated by vehicle traffic. Hence measures that reduce traffic flows within neighbourhoods are likely to be effective in increasing levels of outdoor play.

Private or semi-private outdoor space for play - in the form of gardens, yards or courtyard space - is likely to lead to increased outdoor play, especially where children and families have unmediated, traffic-free access to these spaces. There are also likely to be links between making neighbourhoods more play-friendly and making them more walkable and cyclable.¹⁰

One review concludes that a playable neighbourhood looks like "a rural or suburban neighbourhood, with limited traffic, large yards, and extensive greenery".⁷ The same review notes that "ready access to parks and accessible school grounds may be less important to outdoor play" (although as noted above, other reviews have reached a different conclusion).

Implications for Parents, Services and Policy

The key levers for change are at the municipal level, where decisions about urban planning and design typically reside. Some broad play-friendly principles, such as the need to tame vehicle traffic in residential areas, are likely to apply in all cities.

The research findings about the value of private green space fit with conventional views of parental aspirations,^{26,27} though these may be changing.^{26,27} Such aspirations are in tension with changes underway or in prospect in many cities. One response to this tension is to advocate for

compact, green urban neighbourhoods with features that echo those found in more suburban contexts, including street layouts that reduce traffic speeds and volumes, and features in the public realm that encourage social encounters.⁷

Policy decisions about transport, land uses, housing design, streets, schools and services are intimately linked, highlighting the need for cross-disciplinary work.¹⁶ The creation of a strategic municipal focus, in the form of a well-placed official with an explicit child-friendly planning brief, may be a key step.²⁸

The engagement of children and their caregivers will help to gain insights and bring their experiences and concerns to the direct attention of decision makers. ‘Smart city’ initiatives may allow policy makers to better explore the impact of their planning and design decisions on children.²⁹

Ultimately children’s entitlement to space and time for outdoor play is a matter of values, not just evidence. It is one example of what has been called spatial justice, or “the fair and equitable distribution in space of socially valued resources and the opportunities to use them”.³⁰

References

1. United Nations General Assembly. Convention on the Rights of the Child, 20 November 1989. United Nations. Treaty Series, vol. 1577:3.
2. Yogman M, Garner A, Hutchinson J, Hirsh-Pasek K, Golinkoff RM. The power of play: A pediatric role in enhancing development in young children. *Pediatrics*. 2018;142(3):e20182058. doi:10.1542/peds.2018-2058
3. Tremblay MS, Gray C, Babcock S, et al. Position statement on active outdoor play. *International Journal of Environmental Research And Public Health*. 2015;12(6):6475-6505. doi:10.3390/ijerph120606475
4. Wyver S. The Influence of Outdoor Play on Social and Cognitive Development. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/influence-outdoor-play-social-and-cognitive-development>. Published May 2019. Accessed May 2, 2019.
5. Carson V, Predy M. Active Outdoor Play. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/active-outdoor-play>. Published May 2019. Accessed May 2, 2019.
6. Lester S, Russell W. Children's right to play: An examination of the importance of play in the lives of children worldwide. *Working papers in early childhood development*, No. 57. The Hague, The Netherlands: Bernard van Leer Foundation; 2010.
7. Lambert A, Vlaar J, Herrington S, Brussoni M. What is the relationship between the neighbourhood built environment and time spent in outdoor play? A systematic review. Manuscript submitted for publication. 2018.
8. Moore R, Cosco N. Early Childhood Outdoor Play and Learning Spaces (ECOPALS): Achieving Design Quality. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/early-childhood-outdoor-play-and-learning-spaces-ecopals-achieving>. Published May 2019. Accessed May 2, 2019.

9. Gill T. The benefits of children's engagement with nature: A systematic literature review. *Children, Youth and Environments*. 2014;24(2):10-34. doi:10.7721/chilyoutenvi.24.2.0010
10. Bornat D. *Housing design for community life*. In: London: ZCD Architects; 2016.
11. Jacobs J. *The Death and Life of Great American Cities*. New York, NY: Vintage Books; 1961.
12. Freeman C, Tranter P. *Children and their urban environment*. London: Routledge; 2011. doi:10.4324/9781849775359
13. Bishop K, Corkery L. *Designing cities with children and young people: Beyond playgrounds and skateparks*. New York, NY: Routledge; 2017.
14. UN-Habitat. *Cities of youth: Cities of prosperity*. Nairobi: UN-Habitat; 2013.
15. Aerts J. *Shaping urbanization for children: A handbook on child-responsive urban planning*. New York, NY: UNICEF; 2018.
16. Audrey S, Batista H. Healthy urban environments for children and young people: A systematic review of intervention studies. *Journal of Transport & Health*. 2017;5:S64. doi:10.1016/j.jth.2017.05.208
17. Oliveira AF, Moreira C, Abreu S, Mota J, Santos R. Environmental determinants of physical activity in children: A systematic review. *Archives of Exercise in Health and Disease*. 2014;4(2):254-261.
18. de Vet E, de Ridder DT, de Wit JB. Environmental correlates of physical activity and dietary behaviours among young people: A systematic review of reviews. *Obesity Reviews*. 2011;12(5):e130-e142. doi:10.1111/j.1467-789X.2010.00784.x
19. Shaw B, Watson B, Frauendienst B, Redecker A, Jones T, Hillman M. *Children's independent mobility: A comparative study in England and Germany (1971-2010)*. London: Policy Studies Institute; 2013.
20. Telama R. Tracking of physical activity from childhood to adulthood: A review. *Obesity Facts*. 2009;2(3):187-195. doi:10.1159/000222244
21. Biddle SJH, Pearson N, Ross GM, Braithwaite R. Tracking of sedentary behaviours of young people: A systematic review. *Preventive Medicine*. 2010;51(5):345-351. doi:10.1016/j.ypmed.2010.07.018
22. Xu H, Wen LM, Rissel C. Associations of parental influences with physical activity and screen time among young children: A systematic review. *Journal of Obesity*. 2015;2015:1-23. doi:10.1155/2015/546925
23. Edwardson CL, Gorely T. Parental influences on different types and intensities of physical activity in youth: a systematic review. *Psychology of Sport and Exercise*. 2010;11(6):522-535. doi:10.1016/j.psychsport.2010.05.001
24. Holloway D, Green L, Livingstone S. *Zero to eight: Young children and their Internet use*. London: EU Kids Online; 2013. http://eprints.lse.ac.uk/52630/1/Zero_to_eight.pdf.
25. Larouche R, Garriguet D, Tremblay MS. Outdoor time, physical activity and sedentary time among young children: The 2012-2013 Canadian Health Measures Survey. *Canadian Journal of Public Health*. 2017;107(6):e500-e506. doi:10.17269/cjph.107.5700
26. Pisman A, Allaert G, Lombaerde P. Urban and suburban lifestyles and residential preferences in a highly urbanized society. *Belgeo*. 2011;(1-2):89-104. doi:10.4000/belgeo.6394
27. Boterman WR, Karsten L, Musterd S. Gentrifiers settling down? Patterns and trends of residential location of middle-class families in Amsterdam. *Housing Studies*. 2010;25(5):693-714. doi:10.1080/02673037.2010.483586.
28. Gill T. *Reviving Neighbourhoods: Case Studies of Child-Friendly Urban Planning and Design in Europe and Canada*. Forthcoming 2019.
29. Smith F, Martinho-Truswell E, Rice O, Weeraratne J. *How dashboards can help cities improve early childhood development*. The Hague, The Netherlands: Bernard van Leer Foundation; 2017.
30. Soja EW. The city and spatial justice. *Justice Spatiale | Spatial Justice*. 2009;1.

Active Outdoor Play

Valerie Carson, PhD, Madison Predy, BKin

University of Alberta, Canada

May 2019

Introduction

Play is a fundamental part of childhood and is typically defined as a spontaneous, enjoyable, and self-directed activity with no external goal.¹ Active play is one main type of play.¹ Active play can occur indoors and outdoors but this section will focus on active outdoor play.

Subject

Definition: A recent scientific review on active play in early childhood identified common terms used in definitions of active play including, increased energy exerted, rough and tumble, gross motor movement, unstructured, freely chosen, and fun.² Furthermore, common examples of active play were also identified, including swinging, climbing, pulling, balancing, jumping, rolling, running, and skipping.² Based on this current research a working definition of active play was created: “A form of gross motor or total body movement in which young children exert energy in a freely chosen, fun, and unstructured manner.”² (pg. 164)

Settings: Active outdoor play in early childhood is typically supported by parents in the home (e.g., back-yard) and surrounding neighbourhood (e.g., park) settings.³ However, since the number of children attending childcare outside the home is increasing,⁴ the importance of the childcare setting for supporting outdoor play opportunities is increasingly being recognized.⁵⁻⁷

Prevalence: Information on how much time young children currently spend in active outdoor play is limited to a small number of studies. For example, in a representative sample of Canadian children (3-4 years), parents reported an average of 1.6 (children cared for at home) to 2.1 (children cared for outside of home) hours of outdoor time per day.⁸ Conversely, in relatively large samples of young children from Australia (2-5 years) and the United States (3 years), parents reported average outdoor play time as 3.1 hours a day and 2.6 (weekday) to 3.8 (weekend) hours a day, respectively.^{9,10} Bigger day of the week differences were observed in a large representative sample of Swedish 4-year-olds, with parents reporting double the amount of daily outdoor play

time on weekend days (3 hours) compared to weekdays (1.5 hours).¹¹ Cultural differences have been noted in outdoor play time.¹² For example, in a small sample, it was observed that outdoor time was significantly higher in a Swedish preschool setting compared to a United States preschool setting (211 versus 91 minutes per day).¹³ It is important to note that this body of evidence likely overestimates active outdoor play because not all outdoor play time is active.¹⁴

Problems

In some countries, there is evidence to suggest that children's outdoor play has been declining in recent decades.¹⁵⁻¹⁷ This decline has been attributed to various cultural changes including the increase of perceived safety risks by parents,¹⁸⁻²¹ the growing presence of sedentary screen time in children's lives,^{18,21,22} and the hurried, overscheduled, and academically focused lifestyle.^{19,20,23} Parental concerns around children's safety is thought to be one of the biggest barriers to active outdoor play.^{22,24} Commonly perceived safety risks include stranger abduction, bullies/teenagers, child pedestrian collisions, and injuries.^{21,24} Despite findings that the frequency and seriousness of these risks are quite low, parents are increasingly monitoring their children's play, enrolling children in more structured activities, and keeping children indoors.^{20,21,24}

Research Context and Key Research Questions

The majority of research on active outdoor play in early childhood has been published in the last 10 years.² Existing evidence is primarily observational using cross-sectional designs, and therefore of lower quality.² Consequently, there are a number of research questions to be answered in this area. Three key research questions that are gaining increasing attention include: 1) What are the unique benefits of active outdoor play? 2) What is the role of the child care setting in promoting active outdoor play? 3) How do we accurately measure active outdoor play?

Recent Research Results

Benefits: Studies have found that when children play outdoors they are more physically active than when they play indoors,^{20,21} likely due to less space and equipment restrictions.²⁵ Therefore, active outdoor play is associated with healthy physical, social, emotional, and cognitive development due to the increased engagement in physical activity.²⁶ However, the benefits of active outdoor play extend beyond the well-known health benefits of physical activity. For instance, research has found that active outdoor play and access to green space is associated with higher vitamin D levels,²⁷ improved mental wellbeing,²⁸ better attention behaviours,²⁹ better

self-regulation,³⁰ and improved spatial working memory.³¹

Child care setting: Child care represents an important setting for a large proportion of children to engage in active outdoor play during the day time.^{32,33} Policies at the national, state/provincial, local or centre level may be one potential strategy to ensure young children have adequate active outdoor play opportunities when cared for outside of the home.^{34,35} Recent research has examined provincial/state policy.^{36,37,38} For example, in Canada, all provincial regulatory bodies mandate daily outdoor play if weather conditions are appropriate but only two provinces specify the frequency or time for outdoor play.³⁶ Similarly in the United States, most States (86%) recommend daily outdoor time³⁷ but few (n=9) provide minimum lengths.³⁸ Several studies have also examined outdoor play policies at the child care centre level.³⁹⁻⁴² Overall, these studies have highlighted the importance of policies being translated into practice³⁹ and ensuring the content of policies are not restrictive to outdoor active play (e.g., weather-related policies).⁴⁰

Research Gaps

Given the infancy of research on active outdoor play in early childhood a number of research gaps exist. One key gap involves the current measurement of active outdoor play.^{2,43} Questionnaires administered to parents or educators, are prone to measurement error, and activity monitors typically lack the contextual information needed to identify active outdoor play. However, an accurate measure of active outdoor play that combines activity monitors, global positioning systems (GPS), and log books has recently been introduced in older children.⁴⁴ Future research should determine if a similar technique can be used in early childhood to improve our understanding of active outdoor play. It is also unclear how much active outdoor play is needed daily for optimal growth and development.⁸ Therefore, future research should examine different amounts of active outdoor play with a variety of health indicators in early childhood to inform an evidence-based benchmark that can be promoted.

Conclusions

According to the United Nations High Commission for Human Rights, play is a fundamental right for every child.⁴⁵ Several organizations worldwide have endorsed the importance of active outdoor play and have encouraged future research in this area.^{21,46,47} However, parents from around the world have reported that children today play outside less compared to previous generations,^{15,18,48} largely due to cultural changes around parenting and technology.^{18,20,21} This decline is a major

concern as active outdoor play is strongly related to physical activity in children,²⁰ an important behaviour in healthy growth and development.²⁶ Furthermore, active outdoor play is associated with unique health benefits above and beyond those of physical activity.²⁷⁻³¹ Efforts to reverse the trend of declining active outdoor play in early childhood should consider home, neighbourhood, and child care settings. There are several relevant stakeholders across these settings that can play an important role in increasing active outdoor play in early childhood.²¹

Implications for Parents, Services and Policy

Despite the research gaps in active outdoor play, recommendations for relevant stakeholders can still be made based on current evidence. Young children have limited autonomy from adults. Therefore, parents, early childhood educators, and other caregivers are the gatekeepers for outdoor active play opportunities in early childhood. To encourage healthy growth and development, these individuals should aim to strike a balance with scheduled activities, screen time, and free time so children have ample opportunities to engage in active outdoor play.⁴⁹ Health care professionals and policymakers also play key roles in supporting outdoor active play in early childhood. Where policy does not already exist, regulatory bodies should add policy in child care settings around minimum frequency and duration of daily outdoor time, and policy should be updated as evidence evolves. Additionally, health care professionals should promote active outdoor play to families across settings and weather conditions as an important component of healthy growth and development.²³ Emphasis should be placed on the feasibility of facilitating outdoor active play opportunities for children, given specific programming or equipment is not required.² Though research is needed to continue to advance knowledge in this area, these collective efforts are a starting point to ensure all children regularly experience the joy of playing in the great outdoors.

References

1. Smith PK. *Children and play*. Chichester, West Sussex: Wiley-Blackwell; 2010.
2. Truelove S, Vanderloo LM, Tucker P. Defining and measuring active play among young children: A systematic review. *Journal of Physical Activity & Health*. 2017;14(2):155-166.
3. Veitch J, Bagley S, Ball K, Salmon J. Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health & Place*. 2006;12(4):383-393.
4. OECD. Family Database. PF3.2. Enrollment in childcare and preschools. 2016. http://www.oecd.org/els/soc/PF3_2_Enrolment_childcare_preschool.pdf. Accessed September 17, 2018.
5. Tandon PS, Zhou C, Christakis DA. Frequency of parent-supervised outdoor play of us preschool-aged children. *Archives of Pediatrics & Adolescent Medicine*. 2012;166(8):707-712.

6. Razak LA, Yoong SL, Wiggers J, et al. Impact of scheduling multiple outdoor free-play periods in childcare on child moderate-to-vigorous physical activity: A cluster randomised trial. *International Journal of Behavioral Nutrition and Physical Activity*. 2018;15(1):34.
7. Mazzucca S, Hales D, Evenson KR, et al. Physical activity opportunities within the schedule of early care and education centers. *Journal of Physical Activity & Health*. 2017;15(2):73-81.
8. ParticipACTION. The brain + body equation: Canadian kids need active bodies to build their best brains. The 2018 ParticipACTION Report Card on Physical Activity for Children and Youth. 2018; https://www.participation.com/sites/default/files/downloads/the_participation_report_card_on_physical_activity_for_children_and_youth_2018.pdf. Accessed September 17, 2018.
9. Hinkley T, Brown H, Carson V, Teychenne M. Cross sectional associations of screen time and outdoor play with social skills in preschool children. *PLOS ONE*. 2018;13(4):e0193700.
10. Burdette HL, Whitaker RC. A national study of neighborhood safety, outdoor play, television viewing, and obesity in preschool children. *Pediatrics*. 2005;116(3):657.
11. Berglind D, Tynelius P. Objectively measured physical activity patterns, sedentary time and parent-reported screen-time across the day in four-year-old Swedish children. *BMC Public Health*. 2018;18:69.
12. Waller T, Sandseter EBH, Wyver S, Ärlemalm-Hagsér E, Maynard T. The dynamics of early childhood spaces: Opportunities for outdoor play? *European Early Childhood Education Research Journal*. 2010;18(4):437-443.
13. Raustorp A, Pagels P, Boldemann C, Cosco N, Söderström M, Mårtensson F. Accelerometer measured level of physical activity indoors and outdoors during preschool time in Sweden and the United States. *Journal of Physical Activity & Health*. 2012;9(6):801-808.
14. Vanderloo LM, Tucker P, Johnson AM, Holmes JD. Physical activity among preschoolers during indoor and outdoor childcare play periods. *Applied Physiology, Nutrition, and Metabolism*. 2013;38(11):1173-1175.
15. Karsten L. It all used to be better? Different generations on continuity and change in urban children's daily use of space. *Children's Geographies*. 2005;3(3):275-290.
16. Hofferth SL. Changes in American children's time – 1997 to 2003. *Electronic International Journal of Time Use Research*. 2009;6(1):26-47.
17. Singer DG, Singer JL, D'Agostino H, DeLong R. Children's pastimes and play in sixteen nations: Is free-play declining? *American Journal of Play*. 2009;1(3):283-312.
18. Clements R. An investigation of the status of outdoor play. *Contemporary Issues in Early Childhood*. 2004;5(1):68-80.
19. Gray P. The decline of play and the rise of psychopathology in children and adolescents. *American Journal of Play*. 2011;3(4):443-463.
20. Gray C, Gibbons R, Larouche R, et al. What is the relationship between outdoor time and physical activity, sedentary behaviour, and physical fitness in children? A systematic review. *International Journal of Environmental Research and Public Health*. 2015;12(6): 6455-6474.
21. Tremblay MS, Gray C, Babcock S, et al. Position statement on active outdoor play. *International Journal of Environmental Research and Public Health*. 2015;12(6):6475-6505.
22. Lee H, Tamminen KA, Clark AM, Slater L, Spence JC, Holt NL. A meta-study of qualitative research examining determinants of children's independent active free play. *International Journal of Behavioral Nutrition and Physical Activity*. 2015;12(1):5.
23. Ginsburg KR. The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics*. 2007;119(1):182.
24. Carver A, Timperio A, Crawford D. Playing it safe: The influence of neighbourhood safety on children's physical activity: A review. *Health & Place*. 2008;14(2):217-227.

25. Tonge KL, Jones RA, Okely AD. Correlates of children's objectively measured physical activity and sedentary behavior in early childhood education and care services: A systematic review. *Preventive Medicine*. 2016;89:129-139.
26. Carson V, Lee E-Y, Hewitt L, et al. Systematic review of the relationships between physical activity and health indicators in the early years (0-4 years). *BMC Public Health*. 2017;17(5):854.
27. Absoud M, Cummins C, Lim MJ, Wassmer E, Shaw N. Prevalence and predictors of vitamin D insufficiency in children: A Great Britain population based study. *PLOS ONE*. 2011;6(7):e22179.
28. McCormick R. Does access to green space impact the mental well-being of children: A systematic review. *Journal of Pediatric Surgical Nursing*. 2017;37:3-7.
29. Mårtensson F, Boldemann C, Söderström M, Blennow M, Englund JE, Grahn P. Outdoor environmental assessment of attention promoting settings for preschool children. *Health & Place*. 2009;15(4):1149-1157.
30. Becker DR, McClelland MM, Loprinzi P, Trost SG. Physical activity, self-regulation, and early academic achievement in preschool children. *Early Education and Development*. 2014;25(1):56-70.
31. Schutte AR, Torquati JC, Beattie HL. Impact of urban nature on executive functioning in early and middle childhood. *Environment and Behavior*. 2015;49(1):3-30.
32. Tandon PS, Saelens BE, Christakis DA. Active play opportunities at child care. *Pediatrics*. 2015;135(6):e1425.
33. Tandon PS, Walters KM, Igoe BM, Payne EC, Johnson DB. Physical activity practices, policies and environments in Washington state child care settings: Results of a statewide survey. *Maternal and Child Health Journal*. 2017;21(3):571-582.
34. Pate RR, O'Neill JR, Brown WH, McIver KL, Howie EK, Dowda M. Top 10 research questions related to physical activity in preschool children. *Research Quarterly for Exercise and Sport*. 2013;84(4):448-455.
35. Stacey FG, Finch M, Wolfenden L, et al. Evidence of the potential effectiveness of centre-based childcare policies and practices on child diet and physical activity: Consolidating evidence from systematic reviews of intervention trials and observational studies. *Current Nutrition Reports*. 2017;6(3):228-246.
36. Vanderloo LM, Tucker P. Physical activity and sedentary behavior legislation in Canadian childcare facilities: an update. *BMC Public Health*. 2018;18(1):475.
37. Duffey KJ, Slining MM, Benjamin Neelon SE. States lack physical activity policies in child care that are consistent with national recommendations. *Childhood Obesity*. 2014;10(6):491-500.
38. Kaphingst KM, Story M. Child care as an untapped setting for obesity prevention: State child care licensing regulations related to nutrition, physical activity, and media use for preschool-aged children in the United States. *Preventing Chronic Disease*. 2009;6(1):A11.
39. Erinosh T, Hales D, Vaughn A, Mazzucca S, Ward DS. Impact of policies on physical activity and screen time practices in 50 child-care centers in North Carolina. *Journal of Physical Activity & Health*. 2016;13(1):59-66.
40. Copeland KA, Sherman SN, Khoury JC, Foster KE, Saelens BE, Kalkwarf HJ. Wide variability in physical activity environments and weather-related outdoor play policies in child care centers within a single county of Ohio. *Archives of Pediatrics & Adolescent Medicine*. 2011;165(5):435-442.
41. Wolfenden L, Neve M, Farrell L, et al. Physical activity policies and practices of childcare centres in Australia. *Journal of Paediatrics and Child Health*. 2011;47(3):73-76.
42. Gerritsen S, Morton SMB, Wall CR. Physical activity and screen use policy and practices in childcare: Results from a survey of early childhood education services in New Zealand. *Australian and New Zealand Journal of Public Health*. 2016;40(4):319-325.
43. Bates B, Stone MR. Measures of outdoor play and independent mobility in children and youth: A methodological review. *Journal of Sports Science & Medicine*. 2015;18(5):545-552.

44. Borghese MM, Janssen I. Development of a measurement approach to assess time children participate in organized sport, active travel, outdoor active play, and curriculum-based physical activity. *BMC Public Health*. 2018;18(1):396.
45. Office of the United Nations High Commissioner for Human Rights. Convention on the rights of the child. Geneva, Switzerland: United Nations;1989.
46. Yogman M, Garner A, Hutchinson J, Hirsh-Pasek K, Golinkoff RM. The power of play: A pediatric role in enhancing development in young children. *Pediatrics*. 2018.
47. Play Safety Forum. Managing risk in play provision: A position statement. 2008; <http://www.playengland.org.uk/media/120462/managing-risk-play-safety-forum.pdf>. Accessed September 17, 2018.
48. Valentine G, McKendrick J. Children's outdoor play: Exploring parental concerns about children's safety and the changing nature of childhood. *Geoforum*. 1997;28(2):219-235.
49. Active Healthy Kids. Is Canada in the running? The 2014 Active Healthy Kids Canada report card on physical activity for children and youth. 2014; https://www.participaction.com/sites/default/files/downloads/Participaction-2014FullReportCard-CanadaInTheRunning_0.pdf. Accessed September 17, 2018.

Outdoor Risky Play

¹Ellen Beate Hansen Sandseter, PhD, ²Rasmus Kleppe, PhD

¹Queen Maud University College of Early Childhood Education, Norway

²Kanvas Foundation and Oslo Metropolitan University, Norway

May 2019

Introduction

Risky play has emerged as a topic of interest for researchers, parents, early childhood education and care (ECEC) practitioners/teachers and policymakers and authorities over the last twenty years. The reason for the emergence is manifold, but one point of departure might be the ambivalent wording of mixing the positive connotation of “play” with the more negative intuitive connotations attached to “risk.” Nevertheless, a growing body of research investigates various aspects of risk taking, including playful activities, indicating that the concept reflects a basic aspect of human life.

Subject

What is Risky Play?

Risky play shares some characteristics with various play types included in prior categorizations of play. For example, it could involve elements from locomotor¹ and physically activity play,² rough-and-tumble play,²⁻⁴ as well as play with objects.² It also shares characteristics with deep play (confronting risks and fears and interfacing mortality/death), exploratory play (exploration of the unknown) and mastery play (testing own physical and psychic abilities).⁵

A common definition of risky play is: “thrilling and exciting forms of physical play that involve uncertainty and a risk of physical injury.”⁶ Eight categories of risky play have been identified through observations and interviews with children and ECECs:⁷⁻⁹ 1) Play with great heights – danger of injury from falling, such as all forms of climbing, jumping, hanging/dangling, or balancing from heights; 2) Play with high speed – uncontrolled speed and pace that can lead to a collision with something (or someone), for instance bicycling at high speeds, sledging (winter), sliding, running (uncontrollably); 3) Play with dangerous tools – that can lead to injuries, for instance axe, saw, knife, hammer, or ropes; 4) Play near dangerous elements – where you can fall

into or from something, such as water or a fire pit, 5) Rough-and-tumble play – where children can harm each other, for instance wrestling, fighting, fencing with sticks; 6) Play where children go exploring alone, for instance without supervision and where there are no fences, such as in the woods; 7) Play with impact – children crashing into something repeatedly just for fun; and 8) Vicarious play – children experiencing thrill by watching other children (most often older) engaging in risk.¹

Research Context and Results

Initial research on children's risky play was situated mostly within ECEC contexts (preschool, kindergarten, child care centers etc.). Smith,¹⁰ Greenfield^{11,12} and Stephenson¹³ were early in pointing out how children sought risk in their play; how staff handled the risk in children's play and what benefits this kind of play might have for children. Building on this research, Sandseter⁶⁻⁸ explored the phenomena of four to six-year-old children's risky play and how it can be defined and categorized. Recently, Kleppe et al.^{9,14} identified such play among even younger children, down to one year old. Overall, the existing research shows that children between the age of one and six years all are engaged in risky play in some way, and on a level that suits their individual competence and courage. The concept of risky play is studied in a range of countries, indicating some cross-cultural commonalities of this type of play.^{15,16}

Both observations and interviews reveal that children's emotional experiences in risky play range from pure exhilaration, through exhilaration and fear at the same time (exhilaration bordering fear), to pure fear. This ambiguous feeling is probably what makes this type of play attractive to children.^{6,13,17} The highly aroused feeling children have when engaging in risky play is expressed by joyful, happy and enthusiastic facial expressions, children looking ecstatic and verbal expressions, such as laughing, shrieking, showing their exhilaration and expressions of fearful joy.^{13,18} However, these typical expressions are individual and suggested to be partly related to age, as young children's risky play might appear subtler and less exhilarated.⁹ Regardless of age or level of expressed arousal, such activity seems to be repetitive and induce deep engagement.^{18,19}

Despite this well-documented interest and willingness among children towards risky play, there are indications that this type of play is being restricted in ECEC settings.^{20,21} There are probably several reasons for this, but, first of all, restrictions are affected by ECEC practitioners' perceptions, attitudes and practices, which often are influenced by societal factors, not least parents' opinions.^{22,23} Although some research indicates that ECEC practitioners allow children to

test their abilities, thereby developing necessary skills to cope with real-life challenges,²³⁻²⁷ practitioners face an obvious balancing act between the potential short- and long-term benefits of such play and the cost of injuries. This balancing act is not an easy task, and it is understandable that both ECEC practitioners and parents want to avoid injuries. However, the trend of a general decrease in children's opportunities for risk-taking in play,^{28,29} might have wider negative consequences. First, it is already documented that an increased safety focus has resulted in more restricted freedom of movement, but also, more specifically, in more boring playgrounds.^{21,30-36} Second, albeit less documented, there is a worry that this lack of play opportunities might result in negative long-term consequences such as reduced well-being, excessive risk taking or, on the other hand, increased anxiety.^{37,38} In many ways, the growing research on children's risky play, and its possible benefits, might be seen as a reaction to the safety discourse.

Saliently, there is not one similar way that the safety discourse has been noticeable in different cultural contexts. How to handle and practice risk in children's play seems to be highly culturally dependent. Studies from central Africa describe common child-rearing practices with risk levels that would be unacceptable in the present Western context, such as eight-months-old infants playing with knives, helping to chop tinder for the household fire³⁹ or two-year-olds independently roaming the village and the surrounding forests and fields.⁴⁰ However, comparative studies indicate variations also between Western countries. New, Mardell and Robinson⁴¹ compared Norwegian, Swedish, Danish, Italian and American ECEC-teachers and found that the European teachers are less worried about children's risk-taking than are their American colleagues. Similarly, Little, Sandseter and Wyver²³ found that Scandinavian, and particularly Norwegian ECEC practitioners are more liberal towards children's risky play than practitioners in Australia. Explanations might be found in different theoretical-pedagogical approaches,⁴² but certainly also rooted in cultural beliefs and values, often related to varying emphasis on outdoor play and learning between countries.^{41,43}

However, regardless of cultural context, play appears to be an ideal context to develop the ability to assess and handle risk, where the pretend- or nonliteral aspect allows the players to test out behaviour, situations or actions without the severe consequences of real-life. With this as a backdrop, studies have argued that the ability to handle risk has been a favorable evolutionary trait.³⁸ Additionally, it is found that experience from risky play will result in children being able to assess risk in a better and more accurate way,⁴⁴ and that outdoor risky play have several positive health effects among children.⁴⁵ From a different angle, there are indications of negative effects of

children being overly protected; that curbing risky play and autonomy will increase the likelihood of anxiety, both in childhood^{37,46} and in adolescence and adulthood.^{38,47-51}

Key Research Questions and Gaps

The existing research is largely descriptive and less is documented regarding actual benefits of risky play. This knowledge gap invites further investigations, particularly regarding benefits to health, development and learning. We assume that engagement in risky play in childhood protects against anxiety, faulty decisions and/or excessive risk taking later in life. However, most studies consist of small samples and/or lack the appropriate longitudinal design, randomization and control groups, rendering them unfit to properly address this assumption. Not least, this assumption is difficult to test empirically. There are obvious ethical issues with conducting studies designed to let children take risk (with the potential of injury), while restricting children from playing freely and thereby assessing long-term effects of play deprivation would be equally problematic. Creative methods such as Kretch and Adolph's^{52,53} experiments with the visual cliff (allowing children to cross narrow bridges without the real possibility of falling) should be further developed, suggestively with virtual reality as a promising methodological field. However, transferability of results from laboratory conditions or controlled environments to real life contexts will be an apparent issue. There are also challenges in finding appropriate ways of measuring long term effects of risky play considering what to measure in adolescence and/or adulthood, and finally, to have comparable control groups. Notwithstanding, research on risky play is a rather new and promising field, but future projects need to handle these methodological issues to move the field forward.

Implications for Parents, Services and Policy

The existing research base could be used to guide both parents and ECEC practitioners in how to appropriately support children engaged in risky play. The best available evidence suggests that allowing children a certain level of autonomy strengthens children's self-awareness and ability to self-regulate and reduces the likelihood of anxiety – present and later in life.

ECEC owners, playground developers and policymakers should include knowledge of risky play in the development of play environments.⁵⁴ Research suggests versatile, complex and flexible play environments to accommodate children's diverse interests, varied competence and risk tolerance.

References

1. Sawyers JK. The preschool playground. Developing skills through outdoor play. *Journal of Physical Education, Recreation & Dance*. 1994;65(6):31-33.
2. Smith PK. Play. Types and functions in human development. In: Ellis BJ, Bjorklund DF, eds. *Origins of the social mind Evolutionary psychology and child development*. New York: Guilford; 2005:271-91.
3. Blurton Jones N. Rough-and-tumble play among nursery school children. In: Bruner JS, Jolly A, Sylva K, eds. *Play: It's role in development and evolution*. Harmondsworth: Penguin Books; 1976:352-63.
4. Humphreys AP, Smith PK. Rough and tumble, friendship, and dominance in schoolchildren: Evidence for continuity and change with age. *Child Development*. 1987;58:201-212.
5. Hughes B, Sturrock G. *Playtypes: Speculations and possibilities*. London: London Centre for Playwork, Education and Training; 2006.
6. Sandseter EBH. Scaryfunny: A qualitative study of risky play among preschool children. Norwegian University of Science and Technology, 2010.
7. Sandseter EBH. Categorizing risky play - How can we identify risk-taking in children's play? *European Early Childhood Education Research Journal*. 2007;15(2):237-252.
8. Sandseter EBH. Characteristics of risky play. *Journal of Adventure Education and Outdoor Learning*. 2009;9(1):3-21. doi: <http://dx.doi.org/10.1080/14729670802702762>
9. Kleppe R, Melhuish E, Sandseter EBH. Identifying and characterizing risky play in the age one-to-three years. *European Early Childhood Education Research Journal* 2017;25(3):370-385. doi: <http://dx.doi.org/10.1080/1350293X.2017.1308163>
10. Smith SJ. *Risk and our pedagogical relation to children: On playground and beyond*. New York: State University of New York Press; 1998.
11. Greenfield C. Outdoor play - The case of risks and challenges in children's learning and development. *Safekids News*. 2003(21):5.
12. Greenfield C. 'Can run, play on bikes, jump the zoom slide, and play on the swings': Exploring the value of outdoor play. *Australian Journal of Early Childhood*. 2004;29(2):1-5.
13. Stephenson A. Physical risk-taking: Dangerous or endangered? *Early Years*. 2003;23(1):35-43.
14. Kleppe R. One-to-three-year-olds' risky play in early childhood education and care [Doctoral thesis]. Oslo Metropolitan University; 2018.
15. Little H. Young children's physical risk-taking behaviour during outdoor play: The influence of individual, social and environmental factors [Doctoral thesis]. Macquarie University, 2010.
16. Sandseter EBH, Little H, Ball D, et al. Risk and safety in outdoor play. In: Waller T, Årlemalm-Hagsér E, Sandseter EBH, et al, eds. *The SAGE Handbook of Outdoor Play and Learning* London, UK: SAGE Publications Ltd; 2017.
17. Coster D, Gleave J. Give us a go! Children and young people's views on play and risk-taking. <http://playday.gn.apc.org/resources/research/2008-research/>. Published July 2008. Accessed April 30, 2019.
18. Sandseter EBH. *Children's expressions of exhilaration and fear in risky play. Contemporary Issues in Early Childhood*. 2009;10(2):92-106.
19. Sutton-Smith B. *The ambiguity of play*. Cambridge, Massachusetts: Harvard University Press; 1997.
20. Ball D, Gill T, Spiegel B. Managing risk in play provision: Implementation guide: Play England for the Play Safety Forum, 2012.

21. Sandseter EBH, Sando OJ. "We Don't Allow Children to Climb Trees": How a focus on safety affects Norwegian children's play in early-childhood education and care settings. *American Journal of Play*. 2016;8(2):178-200.
22. Little H, Eager D. Risk, challenge and safety: implications for play quality and playground design. *European Early Childhood Education Research Journal*. 2010;18(4):497-513. doi: <http://dx.doi.org/10.1080/1350293X.2010.525949>
23. Little H, Sandseter EBH, Wyver S. Early childhood teachers' beliefs about children's risky play in Australia and Norway. *Contemporary Issues in Early Childhood*. 2012;13(4):300-316. doi: <http://dx.doi.org/10.2304/ciec.2012.13.4.300>
24. Greator P. Risk and play: Play providers' experience and views on adventurous play. <http://playday.gn.apc.org/resources/research/2008-research/>. Published July 2008. Accessed April 30, 2019.
25. Sandseter EBH. Restrictive safety or unsafe freedom? Norwegian ECEC practitioners' perceptions and practices concerning children's risky play. *Childcare in Practice*. 2012;18(1):83-101.
26. Little H, Wyver S, Gibson F. The influence of play context and adult attitudes on young children's physical risk-taking during outdoor play. *European Early Childhood Education Research Journal*. 2011;19(1):113-131.
27. Kleppe R. Characteristics of staff-child interaction in 1-3-year-olds' risky play in early childhood education and care. *Early Child Development and Care*. 2017;188(10):1487-501. doi: <http://dx.doi.org/10.1080/03004430.2016.1273909>
28. UN Committee on the Rights of the Child U. General comment No. 17 on the right of the child to rest, leisure, play, recreational activities, cultural life and the arts (art. 31). UN Committee on the Rights of the Child. Geneva: United Nations, 2013.
29. Ball DJ, Ball-King L. *Public safety and risk assessment*. London/New York: Routledge; 2011.
30. Wyver S, Bundy A, Naughton G, et al. Safe outdoor play for young children: Paradoxes and consequences. In: Howard S, ed. *Proceedings of the AARE International Education Research Conference: AARE*; 2010.
31. Wyver S, Tranter P, Naughton G, et al. Ten ways to restrict children's freedom to play: the problem of surplus safety. *Contemporary Issues in Early Childhood*. 2010;11(3):263-277.
32. Brussoni M, Olsen LL, Pike I, et al. Risky play and children's safety: Balancing priorities for optimal child development. *International Journal of Environmental Research and Public Health*. 2012;9(9):3134-3148.
33. Ball DJ. *Playgrounds - Risks, benefits and choices*. London: Health and Safety Executive (HSE) contract research report, Middlesex University; 2002.
34. Herrington S, Nicholls J. Outdoor play spaces in Canada: The safety dance of standards as policy. *Critical Social Policy*. 2007;27(1):128-38. doi: <http://dx.doi.org/10.1177/0261018307072210>
35. Spiegel B, Gill TR, Harbottle H, Ball DJ. Children's play space and safety management: Rethinking the role of play equipment standards. *SAGE Open*. 2014;4(1):1-11.
36. Gill T. The evolution of policy on risk management in outdoor play. In: Waller T, Årlemalm-Hagsér E, Sandseter EBH, et al, eds. *The SAGE Handbook of Outdoor Play and Learning London*. UK: SAGE Publications Ltd; 2017.
37. Affrunti NW, Ginsburg GS. Maternal overcontrol and child anxiety: the mediating role of perceived competence. *Child Psychiatry and Human Development*. 2012;43(1):102-112. doi: <http://dx.doi.org/10.1007/s10578-011-0248-z>
38. Sandseter EBH, Kennair LEO. Children's risky play from an evolutionary perspective: The anti-phobic effects of thrilling experiences. *Evolutionary Psychology*. 2011;9(2):257-284.
39. Hewlett BS. *Intimate fathers: The nature and context of Aka Pygmy paternal infant care*. Ann Arbor: University of Michigan Press; 1991.
40. Gottlieb A. *The afterlife is where we come from : the culture of infancy in West Africa*. Chicago: University of Chicago Press; 2004.

41. New RS, Mardell B, Robinson D. Early childhood education as risky business: Going beyond what's "safe" to discovering what's possible. *Early Childhood Research and Practice*. 2005;7(2):1-21.
42. Sandseter EBH, Little H, Wyver S. Does theory and pedagogy have an impact on provisions for outdoor learning? A comparison of approaches in Australia and Norway. *Journal of Adventure Education and Outdoor Learning*. 2012;12(3):167-182. doi: <http://dx.doi.org/10.1080/14729679.2012.699800>
43. Guldberg H. *Reclaiming childhood. Freedom and play in an age of fear*. Oxon: Routledge; 2009.
44. Lavrysen A, Bertrands E, Leyssen L, et al. Risky-play at school. Facilitating risk perception and competence in young children. *European Early Childhood Education Research Journal*. 2015:1-17. doi: <http://dx.doi.org/10.1080/1350293X.2015.1102412>
45. Brussoni M, Gibbons R, Gray C, et al. What is the relationship between risky outdoor play and health in children? A systematic review. *International Journal of Environmental Research and Public Health*. 2015;12(6):6423-6454. doi: <http://dx.doi.org/10.3390/ijerph120606423>
46. Bayer JK, Hastings PD, Sanson AV, et al. Predicting mid-childhood internalising symptoms: a longitudinal community study. *International Journal of Mental Health Promotion*. 2010;12(1):5-17. doi: <http://dx.doi.org/10.1080/14623730.2010.9721802>
47. Segrin C, Woszidlo A, Givertz M, et al. The association between overparenting, parent-child communication, and entitlement and adaptive traits in adult children. *Family Relations*. 2012;61(2):237-252. doi: <http://dx.doi.org/10.1111/j.1741-3729.2011.00689.x>
48. Segrin C, Woszidlo A, Givertz M, et al. Parent and child traits associated with overparenting. *Journal of Social and Clinical Psychology*. 2013;32(6):569-595. doi: <http://dx.doi.org/10.1521/jscp.2013.32.6.569>
49. LeMoyné T, Buchanan T. Does "hovering" matter? Helicopter parenting and its effect on well-being. *Sociological Spectrum*. 2011;31(4):399-418. doi: <http://dx.doi.org/10.1080/02732173.2011.574038>
50. Schiffrin HH, Liss M, Miles-McLean H, et al. Helping or hovering? the effects of helicopter parenting on college students' well-being. *Journal of Child and Family Studies*. 2013;23(3):548-557. doi: <http://dx.doi.org/10.1007/s10826-013-9716-3>
51. Perry NB, Dollar JM, Calkins SD, et al. Childhood self-regulation as a mechanism through which early overcontrolling parenting is associated with adjustment in preadolescence. *Developmental Psychology*. 2018;54(8):1542-1554. doi: <http://dx.doi.org/10.1037/dev0000536>
52. Kretch KS, Adolph KE. No bridge too high: Infants decide whether to cross based on the probability of falling not the severity of the potential fall. *Developmental Science*. 2013;16(3):336-351. doi: <http://dx.doi.org/10.1111/desc.12045>
53. Adolph KE, Kretch KS. *Infants on the edge: Beyond the visual cliff*. In: Slater A, Quinn P, eds. *Developmental psychology: Revisiting the classic studies*. London: SAGE Publishing; 2012:36.
54. Dietze B, Kashin D. Building Capacity to Support Outdoor Play in Early Childhood Education. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/building-capacity-support-outdoor-play-early-childhood-education>. Published May 2019. Accessed May 2, 2019.

Young Children's Outdoor Play-Based Learning

Jane Waters, PhD, Angie Rekers, PhD Student

University of Wales Trinity Saint David, United Kingdom

May 2019

Introduction

In this chapter, we consider current thinking about young children's learning when they engage in outdoor play. The role of the teacher, parent and/or caregiver (hereafter 'adult') and the importance of cultural context in relation to the learning that takes place outside is explored. Recent research, noting the reduced opportunities for unsupervised outdoor play, centres upon:

- The child's developmental outcomes, e.g., physical, socio-emotional, cognitive, creativity and imagination; as well as connections with the non-human natural world.
- The adult's role in children's play, learning, access to and engagement with the outdoors.
- The setting, i.e., urban spaces, natural/non-built spaces, pedagogical spaces.

Subject

Young children's learning is the focus of attention globally and is seen as the route by which countries can invest in their futures¹ as part of Sustainable Development Goals.² Within this global conversation, the position of play in young children's learning, the forms of play that support learning and 'effective' provision for young children's playful activity as a part of their care/education experiences are debated and contested.³⁻⁷ Discussions about the place of the outdoors as a site for young children's play and learning are now commonplace in international literature.⁸⁻¹³

The content of research and literature relating to children's learning outside is wide ranging, and includes, for example:

- the impact of outdoor play provision on children's motor skills development, health and fitness;¹⁴
- risk negotiation skills;^{15,16,17}

- early scientific enquiry through hands-on engagement with the natural world;¹⁸
- participation and sense of self through playful experiences in the outdoors;¹⁹
- the attunement of young children with the physical world around them in order that they are ‘at home in the world’^{20,21} and
- post-humanist and post-colonist ‘common world’ understandings which take account of children's relations with all living and non-living others in their worlds.²²

Problems

An essential feature in the field of outdoor play provision is the orientation of the adult, since this will shape the learning experiences of the child. Key issues are:

- Adult understandings of and orientations toward play, children’s competencies and the outdoor space;
- Tensions between ‘free play’ and play as a directed learning activity, between structured curriculum goals and play-based approaches;
- Availability and quality of outdoor play spaces;
- Decreased opportunities for outdoor play, the causes of which are socially, culturally and historically situated.

Research

The issues above are addressed across a range of research paradigms, often through small scale qualitative studies and, increasingly, through interdisciplinary research which can be influenced by turns in philosophical thinking. This includes, for example, children’s geographies;^{23,24} early childhood education considering children’s inter/intra-activity with materials;^{25,26} ecological and environmental psychology;²⁷ and socio-cultural perspectives within the field of education.²⁸

Key Research Questions

Research questions in the area of outdoor play and learning are similarly wide-ranging. Some key questions include:

1. How does outdoor learning take place? What is the role of the adult and peers?

2. How do we understand children's engagement with their surroundings, adopting a 'common worlds' approach?²⁹
3. What is the contribution of play in nature to children's development?
4. How do children participate in different spaces? How is their participation related to the adult conceptualizations and intended purposes of the space?^{30,31}

Recent Research Results

The results of the small-scale qualitative studies typical of the field are localized to specific contexts. The evidence base includes few larger scale quantitative studies, and those available tend to relate to physical health and activity.³²⁻³⁵ However, children's experiences in the outdoors are shaped by their specific social-cultural context, the perceptions and attitudes of adults towards their competencies and the specific affordances of the outdoor space. Therefore, the existing evidence base can provide some relatable insights for planning for children's outdoor play-based learning.

The orientation of adults who provide access to, and shape interaction with, the outdoor space is emphasized throughout the literature.³⁶ If adults are risk averse, or underestimate children's competencies, then children can be deterred from overcoming fear of new challenges;³⁷ conversely, adults can support children's engagement in risk-taking to gain mastery over challenges and adjust understandings of their own competencies.³⁸⁻⁴⁰

Children's access to outdoor spaces may be increasingly limited as a result of risk aversion, the perception that children lack competency to engage with the world alone, and are in danger when outside.^{13,24,41-43} The corollary to such cultural understandings is that those providing care and education for young children may be risk averse and fear litigation.⁴⁴ Similarly, those designing play equipment for young children can create unappetizing play spaces lacking challenge.⁴⁵ Such adult orientation can mean that children's play, if understood as being freely chosen, personally directed and intrinsically motivated,^{46,47} may be severely curtailed, especially outdoors.⁴⁸ Cultural aversions to inclement weather can also limit children's access to outdoor play,⁴⁹ rather than expecting children to experience weather conditions as part of their development as capable citizens.⁵⁰

The conflict between child-directed activity and adult-driven agendas and interpretations are evident.^{46,51,52} Children's playful activity may contrast with adults' expectations as children interact

⁵³ with materials and concepts. Importantly, playful activity does not necessarily only happen within the allotted time,⁵⁴ or within the allocated spaces.⁵⁵

Adults adopting a ‘playful pedagogy approach’⁵⁶⁻⁵⁸ in which interactions are directed responsively toward the interests and activity of the child appears to enhance opportunities for learning,⁵⁹⁻⁶¹ including increased responsive communication between adults and children, opportunities for joint attention and depth of engagement.^{36,62}

Research Gaps

Further empirical work would benefit our understanding of the impact of professional learning, and differing employment routes into the early years education-care sector, on the provision for, and outcomes of, children’s playful engagement in the outdoors.

While the value of large-scale quantitative studies in the area of early childhood is contested;⁶³ there is a gap in the empirical evidence base which lacks systematic large-scale studies comparing children’s learning for those engaging in regular outdoor play compared to no such engagement.

There are also research gaps pertaining to the impact of, and mechanisms by which, children with multiple needs engage and learn through play in the outdoors.

Conclusions

The literature related to children’s outdoor play and learning suggest that children benefit from opportunities to regularly engage in playful activity in a variety of outdoor spaces. It also demonstrates the relationships between adults’ attitudes and actions and the learning outcomes of children resulting from playful engagement in the outdoors. Children’s learning outside is supported by adults who are responsive to the child’s interests and can support the development of them, without taking control of the activity.

This evidence base is not conclusive; however, play in varied outdoor spaces that is exploratory, includes opportunities to be social, and is supported by responsive adults appears to support children’s enquiry skills, sense of self-efficacy, well-being, connections in the world, and their all-round physical competency. These benefits seem to be enhanced when adults are oriented towards and responsive to children’s enquiries and interests, supportive of children’s managed risk-taking and mastery of physical challenges, and feel confident enough to not restrict children’s

activity unless their safety is genuinely threatened.

Implications for Parents, Services and Policy

The implications of the above are wide ranging. Parents may want to consider providing experiences outdoors in which children can explore the world around them, challenge themselves physically and play with others, without overt and limiting surveillance that restricts opportunities to successfully negotiate risk and gain physical competence. Parents may wish to consider children's opportunities for playful engagement in varied natural and built outdoor spaces balancing concerns about risk with opportunities for learning and exploring. Those providing early childhood services should equally consider these issues. Policy providers should consider whether regulatory requirements or guidelines for early years' service providers should include an explicit expectation for children's outdoor play. Those who regulate, inspect or assess such provision should be mindful of what appears to benefit children when they engage in outdoor play and learning, as set out above, supported by adults attuned to, and responsive to, children's interests. Those providing professional learning for the education-care workforce should consider their provision in the light of the above.⁶⁴

References

1. OECD. Starting Strong: Key OECD indicators on early childhood education and care. 2017. doi: <http://dx.doi.org/10.1787/9789264276116-en>
2. United Nations. Transforming our world: The 2030 Agenda for Sustainable Development. A/RES/70/1. October 2015.
3. Fler M. *Early learning and development. Cultural-historical concepts in play*. New York: Cambridge University Press; 2010.
4. Isenberg JP, Quisenberry N. A position paper of the association for childhood education international play: essential for all children. *Childhood Education*. 2012;79(1):33-39. doi:10.1080/00094056.2002.10522763.
5. Leggett N, Newman L. Play: Challenging educators' beliefs about play in the indoor and outdoor environment. *Australasian Journal of Early Childhood*. 2017;42(1):24-32. doi:10.23965/AJEC.42.1.03.
6. Moss P. Why can't we get beyond quality? *Contemporary Issues in Early Childhood*. 2016;17(1):8-15. doi: 10.1177/1463949115627895.
7. Wood E. Free choice and free play in early childhood education: troubling the discourse. *International Journal of Early Years Education*. 2014;22(1):4-18. doi.org/10.1080/09669760.2013.830562.
8. Coates JK, Pimlott-Wilson H. Learning while playing: children's forest school experiences in the UK. *British Educational Research Journal*. 2018;45(1):21-40. doi:10.1002/berj.3491
9. Grindheim LT, Ødegaard EE. What is the state of play? *International Journal of Play*. 2013;2(1):4-6. doi:10.1080/21594937.2013.769819.
10. Maynard T. Forest Schools in Great Britain: an initial exploration. *Contemporary Issues in Early Childhood*. 2007;8(4):320-331. doi.org/10.2304/ciec.2007.8.4.320.

11. Pacini-Ketchabaw V, Taylor A, eds. Unsettling the colonial places and spaces of early childhood education in settler colonial societies. New York, NY: Routledge; 2015.
12. Somerville M, Powell SJ. Thinking posthuman with mud and children of the Anthropocene. *Educational Philosophy and Theory*. 2018;1-12. doi:10.1080/00131857.2018.1516138
13. Waller T, Sandseter EBH, Wyver S, Årlemalm-Hagsér E, Maynard T. The dynamics of early childhood spaces: opportunities for outdoor play? *European Early Childhood Education Research Journal. Outdoor play and learning special issue*. 2010;18(4):437-443. doi:10.1080/1350293X.2010.525917
14. Bjørgen K. Physical activity in light of affordances in outdoor environments: qualitative observation studies of 3-5 year olds in kindergarten. *Springer Plus*. 2016;(5):950-961.
15. Sandseter EBH. Affordances for risky play in preschool: the importance of features in the play environment. *Early Childhood Education Journal*. 2009;36(5):439-446.
16. Sandseter EBH. Restrictive safety or unsafe freedom? Norwegian ECEC practitioners' perceptions and practices concerning children's risky play. *Child Care in Practice*. 2012;18(1):83-101. doi:10.1080/13575279.2011.621889.
17. Sandseter EBH, Kleppe R. Outdoor Risky Play. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/outdoor-risky-play>. Published May 2019. Accessed May 2, 2019.
18. Waters J, MacDonald N. Using 'quality' measures of children's learning experiences to target professional learning in early years pre-school staff: the experience of one local authority in Wales. European Early Childhood Education Research Association (EECERA) annual conference: Budapest, August 2018.
19. Rekers A. Affordances for children's participation within the reception year classroom and at forest school, PhD thesis. University of Wales Trinity Saint David; Feb 2019.
20. Chawla L. Childhood place attachments. In: Altman I, Low SM, eds. *Place Attachment. Human Behavior and Environment (Advances in Theory and Research)*. Vol.12. Boston, MA: Springer; 1992:63-68.
21. Waite S. Knowing your place in the world: how place and culture support and obstruct educational aims. *Cambridge Journal of Education*. 2013;43(4):413-433. doi:10.1080/0305764X.2013.792787
22. Pacini-Ketchabaw V, Clark V. Following watery relations in early childhood pedagogies. *Journal of Early Childhood Research*. 2016;14(1):98-111. doi:10.1177/1476718X14529281
23. Holloway SL, Pimlott-Wilson H. Enriching children, institutionalizing childhood? Geographies of play, extracurricular activities, and parenting in England. *Annals of the Association of American Geographers*. 2014;104(3):613-627. doi:10.1080/00045608.2013.846167.
24. Horton J, Kraftl P. Three playgrounds: Researching the multiple geographies of children's outdoor play. *Environment and Planning A: Economy and Space*. 2018;50(1):214-235. doi: 10.1177/0308518X17735324.
25. Lenz Taguchi H. *Going beyond the theory/practice divide in early childhood education: Introducing an intra-active pedagogy*. London and New York: Routledge; 2010.
26. Lester S, Russell W. Turning the world upside down: playing as the deliberate creation of uncertainty. *Children*. 2014;1:241-260. doi:10.3390/children1020241
27. Kytta M. The extent of children's independent mobility and the number of actualized affordance as criteria for child-friendly environments. *Journal of Environmental Psychology*. 2004;24:179-198.
28. Waller T, Sandseter EBH, Wyver S, Årlemalm-Hagsér E, Maynard T. The dynamics of early childhood spaces: opportunities for outdoor play? *European Early Childhood Education Research Journal, Outdoor play and learning special issue*. 2010;18(4):437-443. doi:10.1080/1350293X.2010.525917
29. Taylor A. *Reconfiguring the Natures of Childhood*. London & New York: Routledge; 2013.

30. Holloway SL, Valentine G, eds. *Children's Geographies: playing, living and learning*. London and New York: Routledge; 2000.
31. Rekens A. Exploring children's participation and motive orientation in the reception year classroom and at forest school, PhD thesis. University of Wales Trinity Saint David; Feb 2019.
32. 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. doi:10.1186/s12889-015-2452-4
33. Bundy A, Engelen L, Wyver S, et al. Sydney playground project: a cluster-randomized trial to increase physical activity, play, and social skills. *Journal of School Health*. 2017; 87(10):751-759. doi:10.1111/josh.12550
34. Barber SE, Jackson C, Akhtar S, Bingham DD, et al. "Pre-schoolers in the playground": an outdoor physical activity intervention for children aged 18 months to 4 years old: Study protocol for a pilot cluster randomised controlled trial. *Trials*. 2013;14:326. doi:10.1186/1745-6215-14-326.
35. Gray C, Gibbons R, Larouche R, et al. What is the relationship between outdoor time and physical activity, sedentary behaviour, and physical fitness in children? A systematic review. *International Journal of Environmental Research and Public Health*. 2015;12(6): 6455-6474. doi:10.3390/ijerph120606455
36. Waters J, Bateman A. Revealing the interactional features of learning and teaching moments in outdoor activity. *European Early Childhood Education Research Journal*. 2015;23(2):264-276. doi:10.1080/1350293X.2013.798099
37. Little H, Wyver S, Gibson F. The influence of play context and adult attitudes on young children's physical risk-taking during outdoor play. *European Early Childhood Education Research Journal*. 2011;19(1):113-131. doi:10.1080/1350293X.2011.548959.
38. Sandseter EBH. Restrictive safety or unsafe freedom? Norwegian ECEC practitioners' perceptions and practices concerning children's risky play. *Child Care in Practice*. 2012;18(1):83-101 doi:10.1080/13575279.2011.621889.
39. Little H, Wyver S. Individual differences in children's risk perception and appraisals in outdoor play environments. *International Journal of Early Years Education*. 2010;18(4):297-313. doi:10.1080/09669760.2010.531600.
40. Bateman A., Waters J. Risk-taking in the New Zealand bush: Issues of resilience and wellbeing. *Asia-Pacific Journal of Research in Early Childhood Education; Special issue*. 2018;12(2):7-29. doi:10.17206/apjrece.2018.12.2.7
41. Little H. Children's risk-taking behaviour: implications for early childhood policy and practice. *International Journal of Early Years Education*. 2006;14(2):141-154. doi:10.1080/09669760600661427.
42. Gill T. No fear: growing up in a risk adverse society. London: Caloustie Gulbenkian Foundation; 2007.
43. Wyver S, Tranter P, Naughton G, Little H, Sandseter EBH, Bundy A. Ten ways to restrict children's freedom to play: the problem of surplus safety. *Contemporary Issues in Early Childhood*. 2010;11(3):263-277. doi:10.2304/ciec.2010.11.3.263.
44. Gill T. Nothing ventured: balancing risks and benefits in the outdoors. Nottingham, UK: English Outdoor Council; 2010.
45. Little H, Eager D. Outdoor play and learning risk, challenge and safety: implications for play quality and playground design. *European Early Childhood Education Research Journal*. 2010;18(4): 497-513. doi:10.1080/1350293X.2010.525949
46. Else P. Making sense of play: supporting children in their play. Maidenhead: Open University Press; 2013.
47. Playwork Principles Scrutiny Group (PPSG) Playwork Principles, Cardiff: Play Wales; 2015.
<http://www.playwales.org.uk/login/uploaded/documents/INFORMATION%20SHEETS/The%20Playwork%20Principles%20-%20an%20overview.pdf>. Accessed April 30, 2019.
48. Waite S. Teaching and learning outside the classroom: personal values, alternative pedagogies and standards. *Education 3-13: International Journal of Primary, Elementary and Early Years Education*. 2011;39(1):65-82. doi:10.1080/03004270903206141

49. Maynard T, Waters J. Learning in the outdoor environment: a missed opportunity? *Early Years: An International Research Journal*. 2007;27(3):255-265. doi:10.1080/09575140701594400.
50. Einarsdottir J, Wagner JA. *Nordic childhoods and early education: Philosophy, research, policy and practice in Denmark, Finland, Iceland, Norway, and Sweden*. Greenwich: Information Age Publishing; 2006.
51. King P, Howard J. Free choice or adaptable choice: Self-determination theory and play. *American Journal of Play*. 2016;9(1):56-70.
52. Rekers A. The nature of children's participation within the reception year classroom and at forest school, PhD thesis. February 2019. University of Wales Trinity Saint David.
53. Lenz Taguchi H. *Going beyond the theory/practice divide in early childhood education: Introducing an intra-active pedagogy*. London and New York: Routledge; 2010.
54. Rekers A. Exploring children's participation and motive orientation in the reception year classroom and at forest school, PhD thesis. February 2019. University of Wales Trinity Saint David.
55. Ingold T. Bindings against boundaries: entanglements of life in an open world. *Environment and Planning*. 2008;1-16. doi:10.1068/a40156.
56. Goouch K. Understanding playful pedagogies, play narratives and play spaces. *Early Years*. 2008;28(1):93-102. doi:10.1080/09575140701815136.
57. Goouch K. Forging and fostering relationships in play. Whose zone is it anyway? In: Papatheodorou T, Moyles J, eds. *Learning together in the early years. Exploring relational pedagogy*. London: Routledge; 2009:139-151.
58. Wood E. Developing a pedagogy of play. In: Anning A, Cullen J, Fler M, eds. *Early childhood education: society and culture*. London: SAGE; 2008:27-38.
59. Broadhead P. Developing an understanding of young children's learning through play: the place of observation, interaction and reflection. *British Educational Research Journal*. 2006;32(2):191-207. doi:10.1080/01411920600568976
60. Chen F, Fler M. A cultural-historical reading of how play is used in families as a tool for supporting children's emotional development in everyday life. *European Early Childhood Education Research Journal*. 2016;24(2):305-319. doi.org/10.1080/1350293X.2016.1143268
61. Fler M. *Early learning and development: cultural-historical concepts in play*. New York: Cambridge University Press, 2010.
62. Bateman A., Waters J. Asymmetries of knowledge between children and teachers on a New Zealand bush walk. *Australian Journal of Communication Special Issue on Asymmetries of Knowledge*. 2013;40(2):19-32.
63. Moss P, Urban M. The organization for economic cooperation and development's international early learning study: what's going on. *Contemporary Issues in Early Childhood*. 2018;00(0):1-6. doi:10.1177/1463949118803269
64. Dietze B, Kashin D. Building Capacity to Support Outdoor Play in Early Childhood Education. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/building-capacity-support-outdoor-play-early-childhood-education>. Published May 2019. Accessed May 2, 2019.

The Influence of Outdoor Play on Social and Cognitive Development

Shirley Wyver, PhD

Macquarie University, Sydney, Australia

May 2019

Introduction

There is converging evidence that repeated exposure to high quality, unstructured outdoor play opportunities has a positive impact on social and cognitive development. Quality outdoor play can present difficulties for parents and educators who may be used to high levels of supervision and instruction.¹

Subject

There has been a recent trend for educational contexts to reduce the amount of time children spend in unstructured outdoor play due to increased pressure for more direct instruction.² Simultaneously, heightened risk aversion,³ even outside of educational settings, results in fewer opportunities for independent outdoor play.⁴

Problems

The impact of reductions in opportunities for unstructured outdoor play may already be apparent⁵ and responsible for declines in creative thinking,⁶ reduced ability to get along with others⁷ and increased psychopathology.⁷

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

Research Context

A significant focus of outdoor play research has been related to health outcomes, particularly factors such as physical activity and obesity that can be associated with lifelong chronic illness.^{8,5} There has been less research on cognitive and social outcomes and there is a lack of large scale high quality studies. Nonetheless, this is a growing area of research that includes researchers

from multiple disciplines using a wide range of methods ranging from ethnographic studies to randomised controlled trials.

Key Research Questions

Major research questions in this area include:

- What is the relationship between outdoor play and cognitive development?
- What is the relationship between outdoor play and social development?
- Can outdoor play interventions help improve cognition and/or social development?

Recent Research Results

Outdoor play is thought to have an impact on physiological factors that underpin cognitive and social development. The strongest evidence relates to motor⁹ and visual development.¹⁰ Less is known about the development of the brain although studies from nonhuman species have found that play deprivation has a negative impact on cortical development.¹¹

The most promising 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.¹² There is evidence that aerobic exercise improves EFs¹³ and this would perhaps account for the relationship with outdoor play. 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.¹⁴ Research on pretend play and EFs has been found to be promising¹⁵ as has the Tools of the Mind curriculum which incorporates pretend play.¹⁶ 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.

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.^{17,18} 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.¹⁷ A recent qualitative study of

children's active travel to school found participants engaged in playful experiences including careful risk-taking, trying new routes, changing their journeys in increments and experimenting with new activities.¹⁹ These children were also found to show increased levels of social engagement and responsibilities such as looking out for peers and siblings.

One method of changing the outdoor play environment in primary schools has been to introduce loose parts play (LPP).^{8,20} LPP generally involves introduction of large objects with no obvious play purpose onto the playground.²¹ A systematic review indicated promise in the LPP approach to support social-emotional development, but more high quality work is needed and sensitivity of outcome measures could be improved.²² LPP research has generated some unexpected findings. For example, in a recent randomised controlled trial, children in the intervention group (i.e., had opportunities for LPP) were more likely to say they had been pushed/shoved on the playground, yet were less likely to report bullying, and were more likely to report being happy at school.²³ More research is needed, but these results suggest that children may be less intimidated by rough interactions when outdoor play involves loose parts.

The Millennium Cohort Study²⁴ has also revealed some associations with independent outdoor play that initially appear counterintuitive. Three important findings are that children with higher levels of independent outdoor play were: less pro-social, more likely to be from lower socioeconomic status backgrounds and living in close proximity to both family friends and family. The authors speculate that children who are more pro-social may spend more time helping others rather than engaging in independent outdoor play. They also argue that parents of children from lower socioeconomic backgrounds may have different parenting styles, including allowing more independence, either by necessity or choice.

Research Gaps

To date, critical studies to help establish causality have not taken place although their need is recognized.²⁵⁻²⁷ Studies vary their definition of outdoors and play, and outcome measures for the same constructs vary considerably. Infants and very young children have not been participants in higher quality studies.

Information on gender or other individual differences is limited. There is evidence that changes in physical activity associated with changes in the outdoor school play environment are different for boys and girls.²⁸ There are also gender differences related to rough and tumble play²⁹ and pretend

play.³⁰ It therefore seems likely that gender differences exist in the relationships between outdoor play, cognition and social development.

Not enough is known about the impact of natural environments in comparison to built environments. Available evidence suggests that natural environments provide children with more challenge³¹ and stress-buffering conditions^{32,33} that can be important for promoting cognitive and social development.

Conclusions

Although strong causal claims are not yet possible, there is enough evidence to recommend that children are offered opportunities for regular 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

As can be seen, research on outdoor play and its relationship to social and cognitive development has raised some unexpected findings. 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 by promoting development of EFs. Children who have the lowest levels of EFs gain the most from these types of experiences.³⁴ After examining the evidence, some schools have introduced LPP.³⁵ Others have established ‘no homework’ policies and actively encourage outdoor play after school.^{36,37}

References

1. Waters J, Rekers A. Young Children’s Outdoor Play-Based Learning. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/young-childrens-outdoor-play-based-learning>. Published May 2019. Accessed May 2, 2019.
2. Golinkoff RM, Hirsh-Pasek K, Singer DG. Why play = learning: a challenge for parents and educators. In: Singer DG, Golinkoff RM, Hirsh-Pasek K, eds. *Play = learning: how play motivates and enhances children’s cognitive and social-emotional growth*. New York, NY, US: Oxford University Press; 2006:3-12. doi:10.1093/acprof:oso/9780195304381.003.0001.
3. Wyver S, Tranter P, Naughton G, Little H, Sandseter EBH, Bundy A. Ten ways to restrict children’s freedom to play: The problem of surplus safety. *Contemporary Issues in Early Childhood*. 2010;11(3):263-277.

4. Woolley HE, Griffin E. Decreasing experiences of home range, outdoor spaces, activities and companions: changes across three generations in Sheffield in north England. *Children's Geography*. 2015;13(6):677-691. doi:10.1080/14733285.2014.952186
5. Burdette HL, Whitaker RC. Resurrecting free play in young children. *Archives of Pediatrics & Adolescent Medicine*. 2005;159(1):46-50. doi:10.1001/archpedi.159.1.46
6. Kim KH. The creativity crisis: the decrease in creative thinking scores on the Torrance Tests of Creative Thinking. *Creativity Research Journal*. 2011;23(4):285-295. doi:10.1080/10400419.2011.627805
7. Gray P. The decline of play and the rise of psychopathology in children and adolescents. *American Journal of Play*. 2011;4(4):443-463.
8. Bundy A, Engelen L, Wyver S, et al. Sydney Playground Project: A cluster-randomized trial to increase physical activity, play, and social skills. *Journal of School Health*. 2017;87(10):751-759. doi:10.1111/josh.12550
9. Fjortoft I. The natural environment as a playground for children: the impact of outdoor play activities in pre-primary school children. *Early Childhood Education Journal*. 2001;29(2):111-117. doi:10.1023/A:1012576913074
10. Rose KA, Morgan IG, Ip J, et al. Outdoor activity reduces the prevalence of myopia in children. *Ophthalmology*. 2008;115(8):1279-1285. doi:10.1016/j.ophtha.2007.12.019
11. Whitebread D. Free play and children's mental health. *The Lancet Child & Adolescent Health*. 2017;1(3):167-169. doi:10.1016/S2352-4642(17)30092-5
12. Moriguchi Y, Chevalier N, Zelazo PD. Editorial: Development of executive function during childhood. *Frontiers in Psychology*. 2016;7:6. doi:10.3389/fpsyg.2016.00006
13. Hillman CH, Pontifex MB, Castelli DM, et al. Effects of the FITKids randomized controlled trial on executive control and brain function. *Pediatrics*. 2014;134(4):e1063-71. doi:10.1542/peds.2013-3219
14. Diamond A, Ling DS. Aerobic-Exercise and resistance-training interventions have been among the least effective ways to improve executive functions of any method tried thus far. *Developmental Cognitive Neuroscience*. June 2018. [Epub ahead of print] doi:10.1016/j.DCN.2018.05.001
15. Lillard AS, Hopkins EJ, Dore RA, Palmquist CM, Lerner MD, Smith ED. Concepts and theories, methods and reasons: Why do the children (pretend) play? Reply to Weisberg, Hirsh-Pasek, and Golinkoff (2013); Bergen (2013); and Walker and Gopnik (2013). *Psychological Bulletin*. 2013;139(1):49-52. doi:10.1037/a0030521
16. Diamond A, Barnett WS, Thomas J, Munro S. Preschool program improves cognitive control. *Science*. 2007;318(5855):1387-1388. doi:10.1126/science.1151148
17. Fang J-T, Lin J-J. School travel modes and children's spatial cognition. *Urban Studies*. 2017;54(7):1578-1600. doi:10.1177/0042098016630513
18. Risotto A, Tonucci F. Freedom of movement and environmental knowledge in elementary school children. *Journal of Environmental Psychology*. 2002;22(1-2):65-77. doi:10.1006/JEVP.2002.0243
19. Kullman K. Transitional geographies: making mobile children. *Social & Cultural Geography*. 2010;11(8):829-846. doi:10.1080/14649365.2010.523839
20. Armitage M. *Play pods in schools: An independent evaluation (2006-2009)*. England: Playpeople; 2010.
21. Moore R, Cosco N. Early Childhood Outdoor Play and Learning Spaces (ECOPALS): Achieving Design Quality. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/early-childhood-outdoor-play-and-learning-spaces-ecopals-achieving>. Published May 2019. Accessed May 2, 2019.
22. Gibson JL, Cornell M, Gill T. A systematic review of research into the impact of loose parts play on children's cognitive, social and emotional development. *School Mental Health*. 2017;9(4):295-309. doi:10.1007/s12310-017-9220-9

23. Farmer VL, Williams SM, Mann JI, Schofield G, McPhee JC, Taylor RW. Change of school playground environment on bullying: a randomized controlled trial. *Pediatrics*. 2017;139(5):e20163072. doi:10.1542/peds.2016-3072
24. Aggio D, Gardner B, Roberts J, et al. Correlates of children's independent outdoor play: Cross-sectional analyses from the Millennium Cohort Study. *Preventive Medicine Reports*. 2017;8:10-14. doi:10.1016/j.PMEDR.2017.07.007
25. Watt P. Living in an oasis: middle-class disaffiliation and selective belonging in an English suburb. *Environment and Planning A*. 2009;41(12):2874-2892. doi:10.1068/a41120
26. Broberg A, Kytä M, Fagerholm N. Child-friendly urban structures: Bullerby revisited. *Journal of Environmental Psychology*. 2013;35:110-120. doi:10.1016/j.jenvp.2013.06.001
27. Diamond A. Research that helps move us closer to a world where each child thrives. *Research in Human Development*. 2015;12(3-4):288-294. doi:10.1080/15427609.2015.1068034
28. Engelen L, Bundy AC, Naughton G, et al. Increasing physical activity in young primary school children - it's child's play: A cluster randomised controlled trial. *Preventive Medicine*. 2013;56(5):319-325. doi:10.1016/j.ypmed.2013.02.007
29. Lindsey EW. Physical activity play and preschool children's peer acceptance: distinctions between rough-and-tumble and exercise play. *Early Education and Development*. 2014;25(3):277-294. doi:10.1080/10409289.2014.890854
30. Fung W, Cheng RW. Effect of school pretend play on preschoolers' social competence in peer interactions: gender as a potential moderator. *Early Childhood Education Journal*. 2017;45(1):35-42. doi:10.1007/s10643-015-0760-z
31. Kahn PH, Weiss T, Thea Weiss J. The importance of children interacting with big nature. *Children, Youth and Environment*. 2017;27(2):7-24.
32. Mygind L, Stevenson M, Liebst L, et al. Stress response and cognitive performance modulation in classroom versus natural environments: a quasi-experimental pilot study with children. *International Journal of Environmental Research and Public Health*. 2018;15(6):1098. doi:10.3390/ijerph15061098
33. Sandseter EBH, Kennair LEO. Children's risky play from an evolutionary perspective: the anti-phobic effects of thrilling experiences. *Evolutionary Psychology*. 2011;9(2):147470491100900220. doi:10.1177/147470491100900212
34. Diamond A, Lee K. Interventions shown to aid executive function development in children 4 to 12 years old. *Science*. 2011;333(6045):959-964.
35. Travers P. Loose parts play: Canberra primary school students revel in playgrounds filled with junk. ABC News. <https://www.abc.net.au/news/2017-05-09/loose-parts-play-recycling-junk-into-creative-playgrounds/8506212>. Published May 2017. Accessed April 30, 2019.
36. Bramfield Park Primary School. School policies. <http://bramfieldparkps.wa.edu.au/our-school-2/policies/>. Published 2018. Accessed April 30, 2019.
37. P.S. 116 Manhattan. Playtime, Downtime, Family time. <http://www.ps116.org/pdf>. Published 2018. Accessed April 30, 2019.

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 development¹ and physical health,²⁻⁵ including children with disabilities. Exposure to nature may strengthen the immune system⁶ 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. Dymont 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 University 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-ecc-elcc.ca/eng/ecc/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

Early Childhood Outdoor Play and Learning Spaces (ECOPALS): Achieving Design Quality

Robin Moore, MCP, HonASLA, Nilda Cosco, PhD

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

May 2019

Introduction

Child care has become an essential part of everyday life. In 2011, more than half of Canadian parents reported using some type of child care for children aged 4 or younger.¹ These children spend most of their waking hours in childcare, year-round, so it is important that nurturing environments are provided to stimulate child development across all domains. Although receiving little policy attention, evidence suggests that the design of naturalized outdoor environments can contribute substantially and uniquely to health promotion in early childhood.² Because child development facilities are highly regulated, quality must be measurable and created through evidence-based design. Progress is slowly being made in that direction.^{3,4} Design guidelines based on available evidence influence practice.^{5,6,7} Even so, the 2017 Canadian national report on early childhood education does not mention “outdoor”, “playground”, “natural”, or “nature”, even though the cover shows a child in nature.⁸

Subject

A new model of early childhood outdoor space is emerging, here termed Early Childhood Outdoor Play and Learning Spaces (ECOPALS), in response to the obesity crisis⁹ and the children and nature movement,¹⁰ designed to meet health promotion and child development goals.

Research on the value of outdoor play, particularly in support of physical health, has steadily advanced.¹¹ Increased portable play equipment and natural elements in play areas are recommended as a means of increasing physical activity.¹²

Problems

Standardized measures of ECOPALS quality are required to advance the state of the art.

Inequities in health and child development remain problematic in low resource communities. However, recent studies suggest that exposure to biodiverse spaces may be *equigenic*; i.e., support health equity.¹³

Regulations are indoor-centric and variable because childcare licensing policy is largely the responsibility of Canadian provinces and U.S. states. When childcare provision started growing rapidly in the 1970's, the main focus, understandably, was *building* standards to protect children's health, hygiene, and safety.

Building codes control facility design. Childcare building provision, as the dominant investment, is a mix of new construction and re-purposed facilities. The latter are more likely to serve low resource communities and present building adaptation challenges.

Outdoor regulations mainly reference basic health and safety requirements. Outdoor space is still considered as if it were a conventional playground furnished with manufactured play equipment and runnable open space. However, early childhood outdoor spaces are closely supervised, used every day (weather permitting), and need to provide broad activity choices for children.

Traditional “health and safety” codes of practice that discount nature still dominate children's environments policies;¹⁴ however, counter arguments promote the positive impacts of nature on human development¹⁵ and call for a “culture of reasonableness” balancing risk with developmental benefit.¹⁶

Teacher pre-service education traditionally does not emphasize “outdoor classroom” activity; however, pre-service teacher knowledge and self-confidence can be motivated by outdoor coursework.¹⁷

Research Context

Potential ECOPALS exist in many shapes and sizes, ranging from outdoor spaces in home-based, unregulated, informal care serving a few children to large licenced centres with enrolments of several hundred. Across this range, many design requirements supporting child behaviours are similar.

Type of facility and context are variable, including geographic location, enrolment size, socioeconomic profile, urban/suburban/rural location, non-profit/for-profit/national chain ownership, attachment to institutions such as churches, YMCA centres, zoos, botanical gardens, nature centres, and museums. Research on the significance of these factors is lacking. Some, such as climate, may affect design approaches substantially.

Pre-K programs in primary/elementary schools, aimed at kindergarten readiness of vulnerable four-year-olds in the U.S. and Canada, are challenged by school systems that do not recognise the need for outdoor design innovation to serve younger children. Precedent is provided by independent schools with long-standing pedagogical traditions that utilize outdoor environments to support play and learning objectives.¹⁸

ECOPALS can be designed to support child development, modes of learning, and variable teacher roles.¹⁹ Pedagogically convincing, empirical tests with positive results would greatly strengthen support for outdoor learning.

Key Research Questions

Primary question: Which ECOPAL design attributes support safe, joyful places that playfully stimulate child development and intended learning outcomes across all domains? These domains include social-emotional, social studies, cognitive, language and literacy, the arts, and maths, science and technology, as well as physical development (relatively well researched).

Secondary questions: How flexible are design attributes? Are they adaptable to a wide range of contexts (climate, topography, site size, etc.)? Are they physically “lumpy” and expensive to implement like a concrete pathway or “incremental” and inexpensive like a raised deck or shade tree?

Recent Research Results

Positive correlations between outdoor play and physical activity are well established.¹¹ Outdoors, children are more likely to meet recommended physical activity health and fitness requirements.

A behaviour mapping study^{20,3} of 30 preschool ECOPALS demonstrated the importance of adjacency (number of activity settings touching each other) and centrality (location relative to the

geographic center of the space), of activity settings in increasing physical activity.³ These design attributes influence the *form* of site layout and relationships between activity settings.^a As physical content, activity settings can be designed to extend the repertoire of play and learning affordances.²¹ Thus, a pathway is ride-able, a lawn is run-able, a play structure is climb-able, etc.²¹ Portable and loose part components such as wheeled toys, balls, and sticks, afford play and learning repertoires different to fixed components such as trees and shrubs.²¹

The presence of biodiversity is likely to engage multi-age groups of children, to stimulate social inclusion, and expand experiential learning outdoors. As children engage more freely with their surroundings and each other, more active, playful, social interaction is stimulated.^{21,22}

Healthy eating can be supported via children's gardening.²³

Exposure to rich biodiversity stimulates cognitive play and helps young children gain tacit knowledge of natural materials and processes, through which an affective foundation of love of nature and later cognitive understanding can evolve.²⁴

ECOPALS can provide a stage for civic education, instilling intergenerational conservation values and active environmentalism in society.²⁵

Research Gaps

Investigations are needed regarding relationships between individual activity settings and play and learning behavioural repertoires supporting ECOPALS programmatic goals.

Tests of ECOPALS designs based on behaviour setting and affordance principles are lacking across a wide range of physio/climatic/cultural/institutional conditions to better understand contextual influences.

Surveys of regulators, licensing officers, quality assessors, and educators are required to investigate knowledge and attitudes regarding ECOPALS naturalization, and provide evidence supporting changes to policy, practice, and pre-service curricula.

Conclusions

The rapidly advancing focus on early learning and a growing desire to re-engage children with nature is driving the need to demonstrate the developmental importance of high-quality

ECOPALS. Application of available research tools can create an urgently required, robust evidence base to inform early childhood policy, practice, and pre/post service professional development about the potential benefits of well-designed ECOPALS.

On both sides of the Canada-US border, research and practice issues are similar and link to a wider circle of contexts in high income countries. International collaborations among universities, professional organizations, and practitioners could increase collective impact.

Digitally-based, online professional development platforms provide multiple opportunities for sharing knowledge and its application through network extensions to universities and professional development programs in less-developed countries.

The emerging, transdisciplinary ECOPALS field must embrace many related disciplines (ecological and social sciences, child development, landscape design, conservation psychology, and more), to fully reach its potential to influence environmental values in society and ultimately to impact long-term climate change.

Implications for Parents, Services and Policy

Parents should try to choose child development facilities with ECOPALS designed with flowing, looping pathways, wheeled toys, other forms of portable play equipment, loose parts, many different types of settings besides manufactured play structures, and above all, shade trees and lots of nature.

Services providers should recognize ECOPALS naturalization as vital to healthy child development. Implement evidence-based best practices, which emphasize the importance of looping, curvy, wide (at least 1.5m), hard-surfaced pathways, wheeled toys, and a compact diversity of play and learning settings.

Policy makers should revise and expand regulatory frameworks beyond essential health and safety requirements, to include positive support of naturalized ECOPALSs containing diverse settings as “learning arenas.”²⁶ Create and mandate defined risk/benefit assessment protocols to broaden the outdoor imperative and experiential life of children for their good health, and the health of society and planet.²⁷

References

1. Sinha M. Child Care in Canada. Statistics Canada. 89-652-X. Ottawa. 2014. <https://www150.statcan.gc.ca/n1/pub/89-652-x/89-652-x2014005-eng.htm>. Accessed April 29, 2019.
2. Moore R, Cosco N. Growing Up Green: Naturalization as a Health Promotion Strategy in Early Childhood Outdoor Learning Environments. *Children, Youth & Environments*. 2014;24(2):168-191.
3. Smith WR, Moore R, Cosco N, Wesoloski J, Danninger T, Ward DS, Trost SG, Ries N. Increasing Physical Activity in Childcare Outdoor Learning Environments: The Effect of Setting Adjacency Relative to Other Built Environment and Social Factors. *Environment & Behavior*. 2016;48(4):550-578. doi:10.1177/0013916514551048
4. Temple M, Robinson CJ. A systematic review of interventions to promote physical activity. *Pediatric Nursing*. 2014;19:274-284.
5. Greenman J. *Caring spaces, learning places*. Lincoln, NE: Exchange Press; 2005.
6. Olds A. *Childcare design guide*. New York: McGraw Hill; 2000.
7. Moore R, Goltsman S, Iacofano D. *Play for all guidelines: planning, design and management of outdoor settings for all children*. 2nd ed. Berkeley, CA: MIG Communications; 1993.
8. Akbari E, McCuaig K. *Early Childhood Education Report*. Toronto: Ontario Institute for Studies in Education; 2017.
9. Public Health Agency of Canada. Tackling obesity in Canada: Childhood obesity and excess weight rates in Canada. Government of Canada. 2017.
10. Louv R. *Last child in the woods: Saving our children from nature-deficit disorder*. 2nd ed. Chapel Hill, NC: Algonquin Books; 2008.
11. Carson V, Predy M. Active Outdoor Play. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/active-outdoor-play>. Published May 2019. Accessed May 2, 2019.
12. Truelove S, Bruijns BA, Vanderloo LM, O'Brien KT, Johnson AM, Tucker P. Physical activity and sedentary time during childcare outdoor play sessions: A systematic review and meta-analysis. *Preventive Medicine*. 2018;108:74-85.
13. Mitchell RJ, Richardson EA, Shortt NK, Pearce JR. Neighborhood environments and socioeconomic inequalities in mental well-being. *American Journal of Preventive Medicine*. 2015;49(1):80-84.
14. Moore R. Playgrounds: a 150-year-old model. In: Frumkin H, Geller R, Rubin L, eds. *Safe and Healthy School Environments*. Oxford: Oxford UP; 2006:86-103.
15. Frumkin H. Beyond toxicity: the greening of environmental health. *American Journal of Preventive Medicine*. 2001;20:234-240.
16. Brussoni M, Brunelle S, Pike I, et al. Can child injury prevention include healthy risk promotion? *Injury Prevention*. 2015;21:344-347. doi:10.1136/injuryprev-2014-041241
17. Carrier S. The effects of outdoor science lessons with elementary school students on preservice teachers' self-efficacy. *Journal of Elementary Science Education*. 2009;21(2):35-48.
18. Moore R, Cosco N. Greening Montessori school grounds by design. North American Montessori Teachers Association. *NAMTA Journal*. 2007;32(1):128-151.
19. Moore R, Wong H. *Natural learning: the life history of an environmental schoolyard*. Berkeley, CA: MIG Communications; 1997.
20. Cosco NG, Moore RC, Islam MZ. Behavior mapping: A method for linking preschool physical activity and outdoor design. *Medicine & Science in Sports & Exercise*. 2010;42:513-519.

21. Cosco NG. Motivation to move: Physical activity affordances in preschool play areas (Doctoral dissertation). 2006. Retrieved from Edinburg Research Archive. British Library.
22. Beery T, Jørgensen KA. Children in nature: sensory engagement and the experience of biodiversity. *Journal Environmental Education Research*. 2018;24(1):13-25.
23. Benjamin-Neelon S, Evans K. *Preschool garden strategies to combat early childhood obesity - Brief 4*. Durham, NC: Center for Child and Family Policy, Duke University; 2011.
24. Zamani Z. (2013). Affordance of cognitive play by natural and manufactured elements and settings in preschool outdoor learning environments. NC State University, PhD dissertation. <http://www.lib.ncsu.edu/resolver/1840.16/9179>. Accessed April 29, 2019.
25. Clayton S, Colléony A, Conversy P, et al. Transformation of experience: toward a new relationship with nature. *Conservation Letters*. 2017;10(5):645-651.
26. Krasny ME, Lundholm, C, Shava S, Lee E, Kobori H. Urban landscapes as learning arenas for biodiversity and ecosystem services management. In: Elmqvist T, Fragkias M, Goodness J, et al, eds. *Urbanization, biodiversity and ecosystem services: challenges and opportunities: a global assessment*. New York: Springer; 2013:629-664.
27. Ball D, Gill T, Spiegel B. *Managing Risk in Play Provision*. London: National Children's Bureau; 2012.

Note:

^a An activity (or behaviour) setting is an ecological unit defined by spatial / temporal boundaries that differentiates it from adjacent settings. Activity/behaviour settings are constructed from components that afford predictable patterns of behaviour and are likely to be observed commensurate with the affordances offered – open lawn for running, slide for sliding, tree for “hiding,” etc. The theories of behaviour setting and affordance are based on the work of Roger Barker (1903-1990); and James Gibson (1904-1979) and Eleanor Gibson (1910-2002), respectively.

Topic Commentary: Why Outdoor Play?

Mariana Brussoni, PhD

Department of Pediatrics, School of Population and Public Health, University of British Columbia, Canada; British Columbia Children's Hospital Research Institute; British Columbia Injury Research and Prevention Unit

May 2019

Introduction

Play is a dominant activity of children's lives in all cultures.¹ Favourite play memories typically occur outside, particularly in natural settings.²⁻⁴ Adults reflecting on these experiences remember the sense of freedom and fun, a chance to be creative, develop physical confidence and social skills and an opportunity to connect with nature. These play memories and growing research in outdoor play draws attention to important ways that outdoor play differs from play occurring indoors.

While scholarship on play has a lengthy history, interest in outdoor play specifically has rapidly gained the interest of scholars across diverse fields, as they grapple with the importance and meaning of these experiences for children. Papers in this chapter summarize the latest research regarding the influence of outdoor play on development and learning, as well as the important ways that caregivers, educators, policy makers, communities and cities can support children's play. Notable findings include the diverse and important benefits of outdoor play on children's development, health, wellbeing, and potential benefits for families, early childhood centres, schools, communities, and cities that support regular and repeated access to high quality outdoor play opportunities.

Research and Conclusions

Outdoor play is unstructured, freely chosen, intrinsically motivated play that takes place outside. It can often include risk taking and risky play.⁵ Authors in this chapter express concerns about patterns that suggest successive generational declines in children's engagement in outdoor play, and discuss key reasons for the decline, such as adult risk aversion, an academic focus, diminishing availability and quality of outdoor spaces, limited accessible training for early childhood educators in outdoor play pedagogy, and a deficit in policies that adequately support

children's outdoor play in communities and early childhood centres.⁵⁻¹³ James, Dragon-Smith and Lahey⁶ also point to how the pervasiveness of Euro-Western approaches in Canada's educational system have turned children away from play and the land, and towards controlled and regimented environments.

Research highlights a clear relationship between time spent in outdoor play and children's physical activity.⁷ In addition, research suggests the importance of regular and repeated exposure to high quality outdoor play opportunities for fostering creativity, socio-emotional learning, executive functioning, mental health, a sense of self, motor skills and risk negotiation skills, building the immune system, as well as providing an ideal venue for scientific enquiry.⁵⁻¹³ Benefits to the broader community have also been identified, including promoting children's feelings of engagement with the world and sense of environmental stewardship.⁸⁻¹¹

The authors raised concerns regarding predominance of small scale and qualitative studies, with diverse methods and definitions of key concepts. These studies have provided a promising foundation for research on outdoor play and opened many avenues of enquiry. However, there is a need for systematic large-scale and longitudinal studies using universally acceptable measurement tools that would help identify causal links between outdoor play and children's outcomes, as well as ways to support children with multiple needs, and in different cultural and geographic contexts, to access and engage in high quality outdoor play. Furthermore, our understanding of the role of technology, both as an inhibitor, as well as a potential facilitator of outdoor play is in its infancy.

Implications for Development and Policy

The papers in this chapter list the many benefits associated with children's regular and repeated access to high quality outdoor play opportunities.⁵⁻¹³ Gill⁹ suggests an urgency to the need for action and change, raising the spectre of collective generational amnesia as children who grew up with restricted outdoor play opportunities become parents themselves and view this as the norm. He also raises the rapid pace of development, particularly in low- and middle-income countries; the opportunities this provides, but also the potential threats if planning neglects children's needs and does not prioritize provision of accessible and high quality and natural play spaces.

James, Dragon-Smith and Lahey⁶ discuss the importance of learning from Indigenous perspective on outdoor play, which consider humans as part of nature and consider time spent playing and in

nature as necessary to protect and to promote life-long learning. Acknowledging and honouring Indigenous philosophies and approaches, the “energy and medicines” of the land, Elders, and cultural families, can help provide a more holistic approach and children’s understanding of the ecosystem and their place within it.⁶

The collective role of parents, educators, policy makers, communities and municipalities in supporting outdoor play is reflected in the key implications for development and policy:

- Parents, caregivers, and early childhood educators: Consider children’s opportunities for regular and repeated outdoor play in varied natural and built outdoor environments. Strike a balance between scheduled activities, screen time and free time. Resist the urge to limit risky play. Recognize the importance of outdoor play in supporting children’s learning, development, health and wellbeing.^{5,8,12}
- Post-secondary institutions: Provide early learning students, as well as educators already working in centres, with accessible training in outdoor play pedagogy. Support educators in understanding their role in outdoor play provision and developing a playful pedagogical approach.⁸ Embrace and integrate Indigenous philosophies and ways of knowing.⁶
- Policy makers: Develop policies that support regular and repeated access to high quality outdoor play opportunities in early learning programs.¹² The current licensing and regulatory systems tend to be indoor-centric or focused on provision of fixed play equipment. Provide opportunities for licensing of outdoor programs. Incorporate evidence-based design guidelines for the outdoor environments of early childhood education centres, including the importance of access to nature and loose parts and risky play opportunities.^{5,13} Encourage daily outdoor time, regardless of the weather.⁷ Address risk aversion through implementation and support of risk benefit assessment frameworks.¹⁴
- Municipalities: Recognize the needs of children and their caregivers as central to masterplanning, and the importance of widely and equitably accessible outdoor play provision. Engage children in participatory design. Explore designs that limit the dominance of traffic and encourage multi-generational social encounters.^{9,11}

Children can and should be able to play throughout their communities. Addressing the barriers and creating a supportive culture and environment is a collective responsibility. Individuals, such as parents, and educators, and even children themselves, can make meaningful improvements in outdoor play opportunities. A collective approach that also involves institutions, governments,

municipalities and the broader community would be exponentially more powerful in fostering lasting change and ensuring children's equitable access to high quality outdoor play spaces and opportunities.

References

1. Hyun E. Culture and development in children's play. In: *Making sense of developmentally and culturally appropriate practice (dcap) in early childhood education*. Hyun E, ed. New York: P. Lang; 1998:15-30.
2. Singer DG, Singer JL, D'Agostino H, DeLong R. Children's pastimes and play in sixteen nations: Is free-play declining? *American Journal of Play*. 2009;1(3):283-312.
3. Brunelle S, Herrington S, Coghlan R, Brussoni M. Play worth remembering: Are playgrounds too safe? *Child, Youth and Environments*. 2016;26(1):17-36. doi:10.7721/chilyoutenvi.26.1.0017
4. Ferrel Raymund J. From barnyards to backyards: an exploration through adult memories and children's narratives in search of an ideal playscape. *Children's Environment*. 1995;12(3):362-380.
5. Sandseter EBH, Kleppe R. Outdoor Risky Play. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/outdoor-risky-play>. Published May 2019. Accessed May 2, 2019.
6. James VA, Dragon-Smith C, Lahey W. Indigenizing Outdoor Play. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/indigenizing-outdoor-play>. Published May 2019. Accessed May 3, 2019.
7. Carson V, Predy M. Active Outdoor Play. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/active-outdoor-play>. Published May 2019. Accessed May 2, 2019.
8. Waters J, Rekers A. Young Children's Outdoor Play-Based Learning. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/young-childrens-outdoor-play-based-learning>. Published May 2019. Accessed May 2, 2019.
9. Gill T. Designing Cities for Outdoor Play. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/designing-cities-outdoor-play>. Published May 2019. Accessed May 2, 2019.
10. Dietze B, Kashin D. Building Capacity to Support Outdoor Play in Early Childhood Education. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/building-capacity-support-outdoor-play-early-childhood-education>. Published May 2019. Accessed May 2, 2019.
11. Cosco N, Moore R. Creating Inclusive Naturalized Outdoor Play Environments. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/creating-inclusive-naturalized-outdoor-play-environments>. Published May 2019. Accessed May 2, 2019.
12. Wyver S. The Influence of Outdoor Play on Social and Cognitive Development. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <http://www.child-encyclopedia.com/outdoor-play/according-experts/influence-outdoor-play-social-and-cognitive-development>. Published May 2019. Accessed May 2, 2019.
13. Moore R, Cosco N. Early Childhood Outdoor Play and Learning Spaces (ECOPALS): Achieving Design Quality. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online].

<http://www.child-encyclopedia.com/outdoor-play/according-experts/early-childhood-outdoor-play-and-learning-spaces-ecopals-achieving>. Published May 2019. Accessed May 2, 2019.

14. Ball DJ, Gill T, Spiegel B. Managing risk in play provision: Implementation guide. London: Play Safety Forum; 2012.

Indigenizing Outdoor Play

¹V. Angela James, BEd, MA, EdD, ²Chloe Dragon-Smith, BSc ²Wendy Lahey, BSc, BPHE, BEd, MEd

¹Indigenous Languages and Education, Department of Education, Culture & Employment, Government of the Northwest Territories, Yellowknife, Canada; ²Bushkids, Yellowknife, Canada
May 2019

Introduction

Indigenous peoples have thrived on the land now called Canada, since time immemorial. Many cultures and distinct peoples took shape over this time, all intimately tied in co-evolution with land. Nature remains integral to Indigenous systems across the country – encompassing those of languages, politics, governance, and of course, education and childrearing. Through colonization, these systems encountered new ones, intrinsic to Euro-Western cultures. There are fundamental differences of worldview between Indigenous and European cultures, values, practices, and actions.¹ Understandings of outdoor learning and play are no exception. There is much to learn from Indigenous perspectives on outdoor play, perspectives that are rooted in the very places that all children play today.

Subject

No matter the culture or place, early learning discourses are filled with references to children's laughter, fun, and curiosity when playing outdoors. Play is human nature, and through history, Indigenous children spent much time immersed in play, exploring, splashing, digging and wandering where the outdoors and adventures awaited them. As Indigenous scholar, Kathy Absolon expresses:²

“Searching was [also] central to my experience in the bush. I spent most of my childhood to young adulthood in the bush. The absence of fences, neighbors and physical boundaries led way for the natural curiosities of a child to grow and be nurtured. My curious nature ushered me to find my way in the bush.”

Internationally, the different Indigenous cultures have as many ways to express being ‘in the bush’ as there are Indigenous approaches to outdoor play. These vary from speaking about being

‘on the land,’ ‘on country,’ ‘in the forest,’ as well as ‘nature-based experiences’.^{3,4} Indigenous worldviews tend to place humans as part of nature, in reciprocal relationship with other animals, plants, rocks, water, and ecosystems. When time spent in nature is part of everyday living and learning, it becomes a wide-ranging and inclusive experience - as diverse as life itself. Even before children can walk, they engage in play using all of their senses in nature. Dene Elders and knowledge keepers express that time must also be protected for play while on the land for life-long learning:⁵

“Parents and Elders allow play at the same time as teaching. A child's own play and curiosity lend themselves well to teaching opportunities. Elders believe that play is essential to learning.”

Problems

These Indigenous traditional settings with the natural opportunities for children to experience being outdoors seem to have been displaced from mainstream learning, as Euro-Western approaches have dominated the public education system in Canada. In these contemporary approaches to early learning, children are often corralled and controlled by well-meaning adults into set time limits and environments, usually consisting of bright colourful play structures, rather than in natural settings where the land is the “classroom” and the mud, insects, and trees are the “teachers.” As Herrington, Brunelle, & Brussoni describe the modern emphasis on health and safety, risk aversion, and fixed playgrounds are having:⁶

“an unfortunate and unintended effect [on the] creation of outdoor play spaces that consist of primarily equipment rather than natural play elements – what landscape researcher Helen Woolley calls Kit, Fence, Carpet, or KFC.⁷ These KFC spaces are rated as having the fewest opportunities for play compared to play spaces incorporating natural elements and risk-taking.”

We have overstructured our environments through the evolution of the Western system. With these shifts in play spaces during the past century and into the new 21st century, many concerns have arisen related to the development of children’s agency, happiness and well-being. Casey describes that children’s sense of identity, connection to community, social relations, contact with natural environments, and physical growth are being negatively impacted due to the many parameters that impinge upon children’s outdoor play.⁸ These parameters deny Indigenous worldviews of children as part of the environment.

Research Context

There appears to be a high need in the outdoor play scholarship to consider Indigenous research that respects and honours the child in his natural learning and growth patterns, rather than to focus so adamantly on what adults deem important. Knowledge keepers and Elders who contributed to the NWT Indigenous curriculum shared their perspective:⁹

Among the Dene, it is said that the child is born with integrity. The child has worth. It is the birthright of the Dene child to be acknowledged and respected for this. The child who is not respected cannot become what it is meant to be... [that is] a capable person.

Key Research Questions

With this Indigenous worldview to guide the thinking on children's birthrights towards becoming capable people that are integrated in their environments, can Indigenizing approaches provide a more balanced approach to developing practices, programs and policies that impact children's growth and development in outdoor play?

Recent Research Results

Inuit advocate and educator, Rowan argues that Indigenous ways of knowing and being are essential for children's outdoor learning.¹⁰ She speaks of thinking with land, water and ice, allowing access to Indigenous, and more specifically Inuit approaches, when planning and delivering land-based experiences. She describes her outdoor learning activity with preschool children, an Elder-educator, and staff going out on the land to search for *avaalaqiat* (willow branches) to prepare branch backpacks. The pedagogy of such outdoor excursions is grounded in a worldview focusing on knowing and experiencing. "These dual elements are *tukisiumaniq*, which means building understanding or making meaning in life; and *silatunig*, which means experiencing the world". Together they bring forth the essence of outdoor play and learning. These Indigenizing elements of outdoor play add depth by making sense of the natural world that surrounds children. Cree scholar, Michael Hart adds:¹¹

"It can be said [Indigenous] knowledge is holistic, personal (subjective), social (dependent upon inter-relations), and highly dependent upon local ecosystems. It is also intergenerational, incorporates the spiritual and physical, and heavily reliant on Elders to guide its development and transmission."

Research Gaps

Although beneficial in its approach, Indigenizing early learning and outdoor play epistemologies and perspectives present only limited appearance in the Euro-Western dominated scholarship. Warden shares:¹²

In terms of research into outdoor learning, the consideration of indigenizing pedagogies is minimal, with more emphasis being placed on UK and Scandinavian research into land-based experiences in wilder spaces. Carruthers, Den Hoed and Spoel (cited in¹²) state, 'Aboriginal people have been offering sophisticated, land-based education to their children for millennia.'

This limited presence in the Eurocentric literature is in large part due to the fact that written literature comes from Eurocentric systems. To bridge this gap, it becomes incumbent on Indigenous researchers and leaders to contribute to the scholarship on Indigenizing outdoor play in the early learning discourses in order to consider a more naturalistic approach to children's growth, development and learning. It is equally important for non-Indigenous researchers and educators to recognize that knowledge comes in many forms, and will be accessed differently when Indigenizing outdoor play. Using an ethical space, Indigenous and non-Indigenous educators can share a working relationship where values, worldviews and knowledge co-exist respectfully and guide decision making, policy and practice.¹

Conclusions

When Indigenous children participate in outdoor play, they will experience the gifts of Indigeneity, as they develop their ways of knowing, being, doing and believing. And all children, Indigenous or non-Indigenous, will feel a sense of belonging in the place where they learn to play together, as they tap into cultures, practices and worldviews of the Indigenous peoples and lands. Indigenous based philosophies and approaches need to be honoured and acknowledged, and be an integral part of the policy development voice as it relates to outdoor play.

Implications for Parents, Services and Policy

Caregivers and early childhood educators need to pay attention to the many powerful features of Indigenous knowledge across the nations, which can enhance children's learning over the continuum of education. With Indigenous knowledge guiding outdoor play pedagogy, practices and policy, children will gain the exposure to understanding elements of Indigeneity, such as the holistic development of not only their minds, but also their bodies, hearts, and spirits as they experience the outdoors. They may also experience that when learning is personal and relational

while facilitated on the land with Elders, knowledge keepers, and extended cultural families, they can begin to understand the ecosystem around them. Moreover, by focusing on Indigenizing outdoor play, children can experience the energy and medicines of the land, along with place-based stories, circle learning, ceremonies, language, and the cultural and spiritual teachings of Elders and Knowledge keepers. Connecting with Indigenous cultures means connecting with land through many dimensions.

References

1. Ermine W. The ethical space of engagement. *Indigenous Law Journal*. 2007;(6-1):194-201.
2. Absolon K, Willett C. Aboriginal research: Berry picking and hunting in the 21st century. *First Peoples Child & Family Review: A Journal on Innovation and Best Practices in Aboriginal Child Welfare Administration, Research, Policy and Practice*. 2004;1(1):5-17.
3. Bateman A, Hohepa M, Bennett T. Indigenizing outdoor play in New Zealand: A conversation analysis approach. In: Waller T, ed. *The Sage handbook of outdoor play and learning*. Thousand Oaks, CA: SAGE Publications Ltd; 2017;530-544.
4. Lee-Hammond L. Belonging in nature: Spirituality, indigenous cultures and biophilia. In: *The SAGE handbook of outdoor play and learning*. Thousand Oaks, CA: SAGE Publications Ltd; 2017.
5. NWT Government. A Dene way of life. Yellowknife, NT: Department of Education, Culture and Employment; 2004.
6. Herrington S, Brunelle S, Brussoni M. Outdoor play spaces in Canada: As if children mattered. In: Waller T, ed. *The Sage handbook of outdoor play and learning*. Thousand Oaks, CA: SAGE Publications Ltd; 2017:143-160.
7. Woolley H, Lowe A. Exploring the relationship between design approach and play value of outdoor play spaces. *Landscape Research*. 2013;38(1):53-74.
8. Casey T. *Environments for outdoor play: a practical guide to making space for children*. Thousand Oaks, CA: Paul Chapman Publishing, SAGE Publications Ltd; 2007.
9. NWT Government. Dene Kede curriculum. Yellowknife, NT, Canada: Department of Education, Culture, and Employment. 1993.
10. Rowan MC. Relating with land/engaging with elders: Accessing indigenous knowledges in early childhood education through outdoor encounters. In: Waller T, ed. *The Sage Handbook of Outdoor Play and Learning*. Thousand Oaks, CA: SAGE Publications Ltd; 2017:395-412.
11. Hart M. Indigenous knowledge and research: The míkiwáp as a symbol for reclaiming our knowledge and ways of knowing. *First Peoples Child & Family Review: A Journal on Innovation and Best Practices in Aboriginal Child Welfare Administration, Research, Policy and Practice*. 2007;3(1):83-90.
12. Warden C. Nature pedagogy – an exploration of the storied narratives that illustrate its application across spaces inside, outside and beyond. In: Waller T, ed. *The Sage handbook of outdoor play and learning*. Thousand Oaks, CA: SAGE Publications Ltd; 2017:279-294.