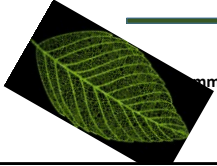


Connecting Children to Nature to Foster Wellbeing and a Caring Relationship with the Living World

Early Infancy Festival - Strasbourg
8 February 2021

Louise Chawla
Community Engagement, Design & Research Center
Program in Environmental Design
University of Colorado Boulder, U.S.A.



Memories of early childhood
in Clermont, 1912-1918

Marguerite Malichard Miles



Aims of this talk

- Overview of benefits of nearby nature for adults and children
- Benefits of preschools, child care centers and kindergartens that provide time in nature
- Fostering a caring relationship and connection with nature in early childhood
- Implications for design and programming



outside windows

nearby nature



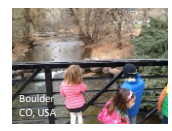
along streets and paths



around homes



at schools and
child care centers



in parks and playgrounds

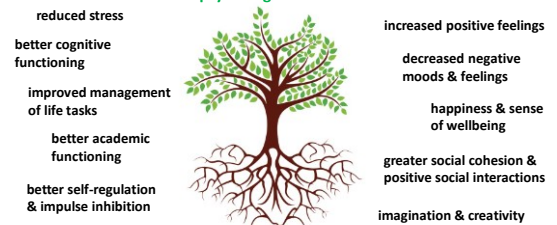
benefits of nearby nature for adults + children

physical health



benefits of nearby nature for adults + children

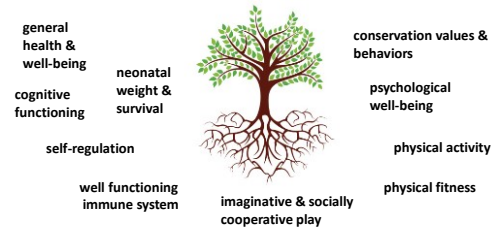
psychological health



Access to nature is an environmental justice issue –

- Many studies show that low-income and ethnic populations have less nature in their surroundings and less access to large parks with good amenities.
- Studies control for family socioeconomic status or mother's level of education, and sometimes show that children in low-SES families benefit more.

benefits of nearby nature for young children



neonatal weight and survival

- More vegetation or green space around pregnant mother's home is often associated with better birth outcomes, such as birth weight and mortality

Dzhambov, A., Dimitrova, D., & Dimitrakova, E. 2014. Association between residential greenness and birth weight. *Urban Forestry and Urban Greening* 13(4):621-29. (review)

Islam, M. Z., Johnson, J., & Sly, P. D. 2020. Green space and early childhood development: A systematic review. *Reviews on environmental Health*, 35(2):189-200.

Mygind, L., et al. 2021. Landscapes of becoming social: A systematic review of evidence for associations and developments between interactions with nature and socioemotional development in children. *Environment International*, 146, 106238.



photo by Maximilian Conacher on unsplash.com

better general health

Parents give their young children higher health ratings when:

- They live < 20 minutes from a green space v. 20 minutes or more

Aggio, D. et al. 2015. Mother's perceived proximity to green space is associated with TV viewing time in children. *Preventive Medicine*, 70:46-49. (Scotland) *higher health ratings, less psychological distress*



photo by Louise Chawla
Vondel Park, Amsterdam

better eyesight

- Six year olds who spend more time outdoors are less likely to have myopia.

Tideman, J. W. L. et al. 2018. Environmental factors explain socioeconomic prevalence differences in myopia in 6-year-old children. *British Journal of Ophthalmology*, 102(2), 243-247. (The Netherlands)



Amsterdam nature playground

psychological well-being

- More available neighborhood green space is associated with fewer emotional problems in young children—in some cases, only for children from socially disadvantaged families.

- Aggio et al. 2015 (Scotland)
- Islam, M. Z., Johnson, J., & Sly, P. D., 2020 (review)
- Mygind, L. et al. 2021. Review that includes studies of preschoolers by Flouris, Midouhas & Joshi, 2014; Richardson et al., 2017; Zach et al., 2016; McEachan et al., 2018; Scott et al., 2018.



photo by Louise Chawla

physical activity

- A number of studies show that children from infancy to 7 years are more likely to play outside and be physically active if they have access to green spaces.

Christian, H. et al. 2015. The influence of the neighborhood physical environment on early child health and development. *Health and Place* 33:25-36. (review)

Jia, P. et al. 2020. Green space access in the neighbourhood and childhood obesity. *Obesity Reviews*. <http://dx.doi.org/10.1111/obr.1310>



Frieberg, Germany

risky play

"Risk-taking allows children and young people to learn vital lessons about themselves and their world. These are lessons that cannot be taught and can only be learned through experience.

Caution, resilience, courage, knowledge about one's own abilities and limitations, and self-confidence to reach beyond them are learned through self-chosen action."



Danish forest preschool

Risk in Play and Learning
Ubud-Höör Declaration, Sept. 2017
International School Grounds Alliance
www.internationalschoolgrounds.org/risk

Free play and exploration in nature enables children to learn how to manage risk.



Columbia Families in Nature
photos © Community Ecology Institute



benefits of child care centers, preschools and kindergartens that provide time in nature

Schools and child care centers for young children provide conditions for comparing outcomes for children who have access to naturalized grounds, gardens and forests versus those who have paved and built playgrounds, or observe differences before and after greening.

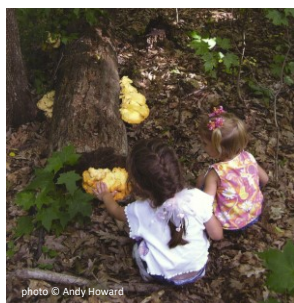
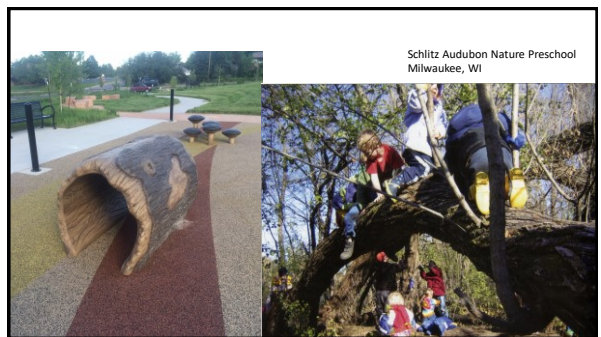


photo © Andy Howard



photo by Louise Chawla



Schlitz Audubon Nature Preschool
Milwaukee, WI





general development & well-being

1-3 year olds were compared in Italian nursery schools which emphasized outdoor play and learning (primarily in school garden) versus traditional nursery schools (76 v. 84 toddlers). Teachers evaluated each child in January and again in June.



Outdoor toddlers showed significantly greater improvement in:

- cognitive development
- emotional development
- social development
- fine motor skills
- awareness of their environment

Monti, F. et al., 2017. The role of outdoor education in child development in Italian nursery schools. *Early Child Development and Care*, published online 11 July, DOI: 10.1080/03004430.2017.1345896.

When children in a nature kindergarten in British Columbia, Canada were compared with children in a conventional kindergarten across two years, there was no difference in their cognitive functioning at the end of the school year, but children in the nature kindergarten had significantly greater gains in:

- large muscle motor coordination
- social skills (social responsibility, cooperation, assertiveness, self-control)
- decreased social anxiety, sadness, loneliness

Müller et al., 2017. Effects of nature kindergarten on children's functioning. *Children, Youth & Environments*, 27(2): 47-69.



Parents give their young children higher health ratings when:

- Their children play in natural preschool yards v. conventional play yards

Soderstrom, M. et al. 2013. The quality of the outdoor environment influences children's health—A cross-sectional study of preschools. *Acta Paediatrica* 102(1):83-91 (Sweden)
higher health ratings, longer sleep at night



healthy immune system

The grounds of four urban day care centers in Finland were covered with forest floor soil and sod for a 28-day period. The microbiota on children's skin and in their guts were compared with children in three control day care centers and three nature-oriented centers that visited local forests.

Over the 28 days, for the children in the intervention centers, their microbiota became similar to that of the children who visited nearby forests. These changes characterized healthy immune system markers.

Roslund, M. I. et al. 2020. Biodiversity intervention enhances immune regulation and health-associated commensal microbiota among daycare children. *Science Advances*, 6(42), eaba2578.



physical fitness

Preschool & kindergarten children who play on natural terrain perform better on tests of balance and motor coordination than children who play on traditional playgrounds.

Müller et al., 2017

Fjortoft, I. 2001. The natural environment as a playground for children. *Early Childhood Education Journal*, 29(2):111-117.

Fjortoft, I. 2004. Landscape as playscape. *Children, Youth & Environments*, 14(2): 21-44.

self-regulation and cognitive functioning

Preschool children with green school grounds and natural areas for outdoor play have lower measures of ADD/ADHD, inattention, and impulsivity.

- Chawla (2015)
- Islam, Johnson & Sly (2020)
- Mygind, L. et al. (2021)



A longitudinal study compared 562 children in 28 daycare centers in Norway from ages 3-7, based on average daily hours outdoors. At age 3, children with high hours outdoors (7 hours/day) did not differ significantly from children with low hours (3 hours/day).

Children with high hours outdoors showed dramatic decline in inattention and hyperactivity symptoms from ages 3-5, which they retained at age 6.

They also showed consistently better performance on digit span memory tests from ages 3-7.



typical suburban Oslo preschool setting



In sum, children with more preschool hours outdoors between ages 3-6 were better prepared for learning when they entered school at age 7.

Ulset, V. et al. 2017. Time spent outdoors during preschool. *Journal of Environmental Psychology*, 52, 69-80.

imaginative & socially cooperative play



Robertson, N., Morrissey, A.-M., & Moore, D. 2020. From boats to bushes: Environmental elements supportive of children's sociodramatic play outdoors. *Children's Geographies* 18(2): 234-246.

Children play more creatively—with more constructive, sensory, and socially cooperative play—in natural versus built spaces.

Chawla, L. 2015. Benefits of nature contact for children. *Journal of Planning Literature*, 30(4), 433-452. (review)

Dankiw, K., et al. 2020. The impacts of unstructured nature play on health in early childhood development: A systematic review. *PLoS ONE* 15(2): e0229006.

Houser, N. E., et al. 2016. Let the children play. *AIMS Public Health* 3(4): 781-799. (review)

Children in preschool and kindergarten engage in longer play episodes in natural v. traditional play areas.



Luchs, A. & Fikus, M. 2013. A comparative study of active play on differently designed playgrounds. *Journal of Adventure Education and Outdoor Learning* 13(3), 206-222.

Morrissey, A.M, Scott, C. & Rahimi, M. 2017. A comparison of sociodramatic play processes of preschoolers in a naturalized and a traditional outdoor space. *International Journal of Play*, 2017 6(2):177-197.

conservation values and behaviors

Preschools that are closer to urban green spaces, where walks beyond the school are routine, have children who express more empathy and concern for other life forms and show more awareness of human-nature interdependence.



Giusti, M., Barthel, S., & Marcus, L. (2014). Nature routines and affinity with the biosphere: A case study of preschool children in Stockholm. *Children, Youth and Environments*, 24(3), 16-42.

fostering a caring relationship & connection with nature in early childhood

In early childhood, **connection to nature** has been defined as:

- enjoying nature
- wanting to play in nature
- interest, curiosity about nature
- empathy for other living things
- awareness of human reliance on nature and potential to hurt or help nature
- sense of responsibility for nature

Chawla, L. (2020) Childhood nature connection and coping with environmental change. *People & Nature*, 2, 619-642.



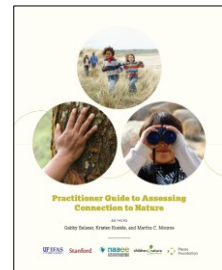
photo © Gene Myers

For 3-6 year olds, it is usually measured with picture choices and games.

puppets for biophilia interview



photo © Thomas Beery



<https://naaee.org/eeepro/publication/practitioner-guide-assessing-connection>

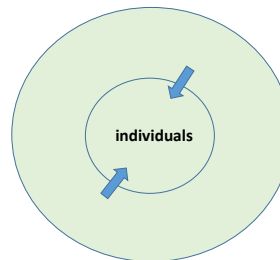


favorite place painting by a fourth-grade girl in Kentucky, USA

Just feeling **connection with nature** is associated with benefits for health & happiness.

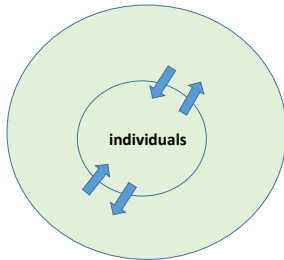
- self-reported good health and wellbeing
- fewer psychological complaints
- prosocial & positive development
- creative thinking

Chawla (2020)



"nature as medicine"

benefits of nature experiences for human wellbeing



“nature as the biosphere, in which humans are one part”

connection and care for nature are relational values, of mutual benefit to human wellbeing and the surrounding living world

Strong predictors of connection with nature and lifelong care for the natural world include:

- routine childhood play and exploration in nature

Chawla & Derr 2012



photo © Reba Rye

- supportive family members, teachers, mentors or friends



photo © Tori Derr

... who give children freedom to encounter nature at their own pace



photo © Allison Rhatigan

... who model care for living things



photo courtesy Mary Rivkin

... and invite children to express care for animals, plants, places

Turn Back Time Care Farm
Paxton, MA, USA
tbtinc.org



photo © Turn Back Time Care Farm

... who are ready to stop,
look, listen, notice what
children notice, and talk
about it in ways that show
respect for other living
things



Corner of the Sky home-based preschool
from Rusty Keeler, *Seasons of Play*

... who tell
stories that invite
children to
imaginatively
inhabit the lives
of other creatures



photo © Christian Both

... who encourage children to use the arts,
storytelling and writing to express what
they notice and feel in nature



praying
mantis



beetle



grasshopper



orb spider

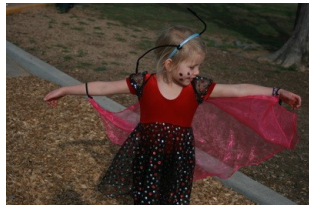
drawings by 4-
year-olds in
Boulder Journey
School, CO



photo © Tina Briggs



When the Boulder, CO Department of Parks & Recreation asked four-year-olds in Boulder Journey School to evaluate a trail around Coot Lake, the children made drawings of the insects they saw and made useful suggestions to improve the trail for people and insects.



Children designed insect costumes
so that their large size would be less
likely to frighten insects at the lake.



■ opportunities to
learn how to take
action for nature
with family members
or in schools or out-
of-school programs

native plantings for ecological restoration
Columbia Families in Nature, Maryland, USA
www.communityecologyinstitute.org

© Community Ecology Institute



High school and college students do community service by gardening with 2-5 year olds in Casa Cuna, a free day care center for low-income working parents in Puebla, Mexico.

2013 – starting the garden

photo by
Illène Pevec



2013 – all ages
assist in planting

photo © Illène Pevec

the
garden
grows

2016



photo ©
Illène Pevec

2017 –
harvesting a pomegranate tree planted in 2014



photos by Illène Pevec

Natural areas
for children must
be pesticide free.



American College of Obstetricians & Gynecologists, 2013
American Academy of Pediatrics 2012
Roberts, Karr & Council on Environmental Health 2012
Ontario College of Family Physicians 2012

pesticide risks in outdoor areas

Exposure to pesticides by children, adolescents or childbearing adults are associated with:

- miscarriages
- low birth weight, birth defects
- childhood cancers
- respiratory and lung diseases
- reduced IQs, ADD, learning disabilities
- autism spectrum disorder
- **and the unraveling of the biosphere**

Eco-Healthy Child Care
endorsement / cehn.org/our-work-eco-healthy-child-care

Recommendations



Bring nature where children live by greening residential neighborhoods.



photos © Janet Loebach

kindergarten & elementary school ground in London, Ontario before and after participatory redesign for nature play and learning

Naturalize school grounds for nature play and outdoor classrooms and open them for community parks after school hours.

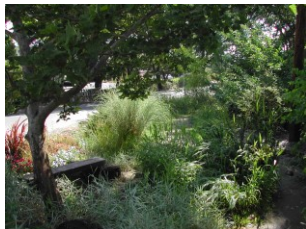


from Rusty Keeler, *Natural Playscapes*

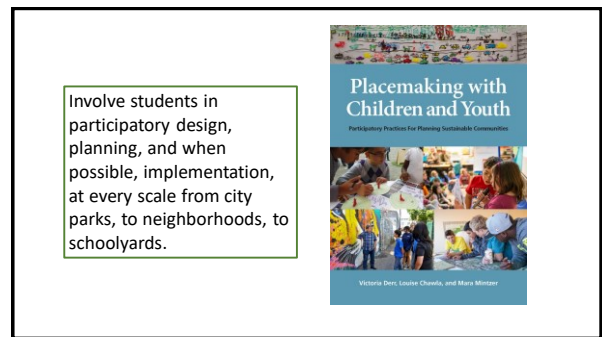
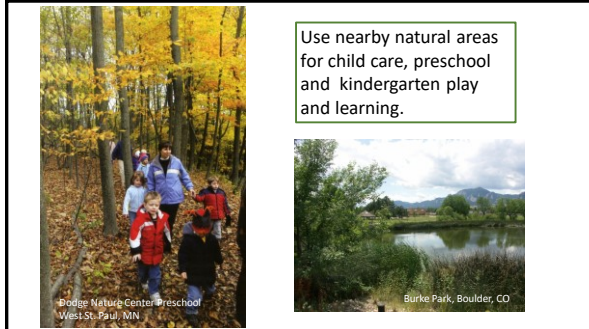
Naturalize the grounds of preschools and child care centers.



Roseville Community Preschool * Roseville, CA







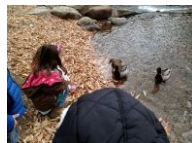


photos by Lynn Lickteig
www.growingupboulder.org

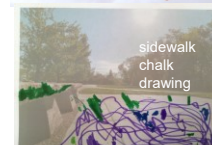
Four-year-olds, teachers and parents in a Reggio Emilia preschool take the city bus to explore the Boulder Civic Area and share their ideas for its redevelopment.



Each child serves as leader in turn, picking a place in the civic area to explore for 10-minutes.



houseboat



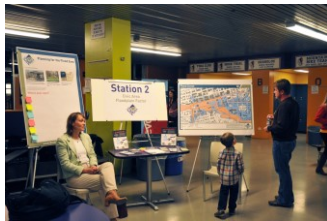
sidewalk
chalk
drawing



prince and
princess at
the Museum
of Contemporary Art



preparations for city open house



. . . and the city listened

To keep up with research on benefits for children from contact with nature and developing connection and care for nature:

Children and Nature Network Research Library
www.childrenandnature.org