

Room to Grow: The Importance of Urban Greening

by Mara Walters

Introduction

Over half of the world's population currently lives in an urban environment, and this number is only expected to increase in the coming years (Kondo, Fluehr, McKeon, & Branas, 2018). The physical environment of a child's neighborhood and housing can be looked to as an indicator of the affordances that may influence their development. This link refers to Bronfenbrenner's (1974) Ecological Theory Model in which he suggests that the internal qualities of a child and the external characteristics of their environment are shown to influence their growth and development. The model is interconnected, meaning the instability of a child's physical environment can lead to mirroring effects in other components of their life. Following this framework, the urban environmental context that many children grow up in can be predicted to influence the activities and experiences that are afforded within that physical environment. Urban housing, or the inner-city, has been shown to put children at risk for falling behind developmentally due to the affordances, or lack thereof, that it provides and risk factors that children become exposed to (Christian, Zubrick, & Foster, 2015; Evans, 2006; Wolch et al., 2014).

While the natural world, or green space, has been cited frequently (Kondo, Fluehr, McKeon, & Branas, 2018; Lee, Jordan, & Horsley, 2015; Maller, Townsend, Pryor, Brown, & St Leger, 2006) to promote cognitive, physical, and mental health in youth, access to such beneficial spaces remains stratified by income and even race (Wolch, Byrne, & Newell, 2014). Multiple studies (Wolch et al., 2014; Nutsford, Pearson, & Kingham, 2013; Lee, Jordan, & Horsley, 2015) have shown that the demographics of ethnic minorities and low-income individuals have decreased levels of access to parks and recreational programs compared to their White and affluent counterparts (Wolch et al., 2014). This inequity that results from green space not being uniformly available to populations based on socio-economic status is so significant to an individual's health and

developmental outcomes that it has officially been recognized as an environmental justice issue (Wolch et al., 2014). Lack of adequate access to green space has been directly linked to the developmental disadvantages that disproportionately affect low-income youth living in crowded urban cityscapes (Lee, Jordan, & Horsley, 2015). This population of urban-dwelling children is recognized also as the low-income youth that occupy the urban core, or "inner city", in the majority of urban-greening literature (Taylor, Wiley, Kuo, & Sullivan, 1998; Lee, Jordan, & Horsley, 2015; Wolch et al., 2014). The demographics that make up these urban cityscapes are overwhelmingly populations of color and those that work low-earning jobs (Wolch et al., 2014). Because urban greening literature overwhelmingly uses the "urban youth" synonymously with "low-income youth," the population of children affected by this lack of adequate natural landscapes will be discussed as "low-income" and "urban-dwelling" children interchangeably in this paper. Green space is frequently absent from these urban neighborhoods, where low-income populations are concentrated, whereas wealthier communities, often in the suburban outer-ring, live in close proximity to natural spaces that are well-served, and well-maintained (Wolch et al., 2014).

The growing body of research on green space suggests links to restorative and favorable outcomes for children that have the potential to be extremely significant in the lives and development of those that dwell in urban environments (Nutsford, Pearson, & Kingham, 2013). With low-quality housing affecting children as severely as instilling chronic stress, dizziness, and poor cognitive control, natural resources can be seen as an alleviating solution (Wells, 2000).

Missed Opportunities for Motor Development and Associated Health Benefits

The accepted framework that an individual's health is directly connected to their place of residence

also has roots in environmental affordances (Chawla, Keena, Pevec, Stanley, 2014; Lee, Jordan, & Horsley, 2015). Access to green space is considered significant in promoting positive opportunities for healthy development and has been frequently cited to positively impact physical, mental, and emotional health (Kondo, Fluehr, McKeon, & Branas, 2018; Lee, Jordan, & Horsley, 2015; Maller, Townsend, Pryor, Brown, & St Leger, 2006). Focusing on physical health, McCracken (2016) suggests that higher amounts of neighborhood green space are correlated with an overall better wellbeing in residents, including higher reports of physical activity, which can lead to reductions in chronic disease, such as cardiovascular disease and diabetes. With decreased access to green space, a lack of quality facilities and resources diminishes opportunities for physical activity in low-income youth (Romero, 2005). Consequently, these children are likely to show lower levels of physical exercise than those in a higher socio-economic group, placing them at a higher risk for future chronic health problems (Romero, 2005). Natural areas in crowded urban cityscapes have been shown to be so valuable to human health that, in a study done by Villeneuve (2012), it was found that in urban environments, the presence of green space is strongly associated with long-term reduction in mortality of the residents.

Decreased opportunities to get active in the surrounding environment of urban-dwelling children has been shown to impact their long-term development. Numerous studies performed have suggested that children engage in more physically demanding play and even develop better motor skills when playing in more natural areas (Evans, 2006; Wells & Evans, 2003). With green space sparsely located in urban environments, urban youth are at risk of not acquiring adequate motor development, which has been linked to outcomes of poor endurance and higher likelihood for injury (Hanscom, 2016). Motor development, Hanscom (2016) suggests, is a set of acquired and refined skills that can be cultivated through free and/or risky play. Although play can occur on built play equipment or pavement, more naturalized settings provide for more imaginative and sensory play (Chawla, 2015). Free play, or unstructured physical activity frequently performed outdoors during the child's free time, is

recognized as a major factor in the development of youth (Brussoni, Olsen, Pike, & Sleet, 2012). The authors go on to suggest that children can begin to understand societal roles, norms, and values as well as develop physical and cognitive awareness, creativity, and competency. Especially in the outdoors, free and risky play—play with the risk of physical injury—are important in developing navigation competency and spatial and environmental awareness, which, overall, promote optimal motor development (Brussoni et al., 2012).

Barriers to Play

Despite children's tendency to favor free and risky play as well as its numerous benefits, children from low socio-economic, urban environments are less likely to engage in this type of play due to a number of environmental and social barriers (Veitch, Salmon, & Ball, 2008). Parental supervision plays a major role in a child's opportunities for free and risky play. Wells (2000) highlights more-restricted play as being characteristic of children living in urban high-rises. In areas disproportionately affected by violence and crime, parents intend to protect children by often restricting them from outdoor play (Black, 1998; Wolch et al., 2014). Even if an urban neighborhood had a designated community green space, the perception of an unsafe atmosphere can prevent parents from allowing their children to utilize these spaces (Wolch et al., 2014). Although it may protect children from neighborhood violence, restriction can also have the adverse effect of impeding the child's development by denying opportunities for independence and competency (Hanscom, 2016). Play deprivation is increasingly becoming an issue for the population of youth that are denied adequate outdoor spaces designated for adventure. Declining opportunities for the development of motor and cognitive skill sets that free play promotes places these disadvantaged children in a vicious cycle with potential lifelong repercussions, like insufficient motor development, obesity, and a decrease in perception and judgement skills (Brussoni et al., 2012).

The barriers to play that arise in urban environments are shown to gradually break down with the addition of green space (Branas et al., 2011; Kuo & Sullivan, 2001; Younan et al., 2016). In a study

examining public housing residents that live nearby vegetation and those that do not, the individuals that were in closer proximity to trees and other natural components of green space felt a greater sense of connectedness with their community and reported fewer incidents of street violence (Wells, 2000). The idea that green space acts as a buffer against neighborhood violence is also supported by Kuo & Sullivan (2001) and Branas et al. (2011). Branas et al. (2011) utilized the “broken windows” theory, suggesting that the lack of green space appears inviting to criminal activity, therefore increasing instances of violence. Kuo and Sullivan (2001) adopt a psychological context, suggesting that contact with nature—promoted by the presence of green space—results in reduction of mental fatigue, which is a precursor to outbursts of violent behavior. The alleviation of the perceived barrier of safety can additionally be seen in improved connections to one’s local community, mediated through green space. Neighborhoods with natural landscaping have been shown to promote community social engagement, accordingly strengthening the trust between neighbors (Wells & Evans, 2003). The increased community interaction can increase perceptions of safety and belonging, allowing parents to perceive their child’s environment as more secure and permit more free play (Wolch et al., 2014).

Outside as a Mental Buffer

Along with improved physical health, the multifaceted effects of the natural world can be emphasized by the alleviation of mental ailments experienced through green space. With urban-dwelling children being the most susceptible to mental illness and chronic afflictions like stress, neuroticism, and behavioral problems, the lack of green space they face only exacerbates the disadvantages that already burden them (Evans, 2006; Harker, 2006; McCracken, Allen, & Gow, 2016). A frequent problem cited in urban, inner-city housing is overcrowding. High-density living quarters can have countless detrimental effects on children, including less perceived social support, more strained familial interactions, and increased mental health issues like depression and anxiety (Evans, 2006; Harker, 2006). The coping mechanisms that children often employ to counteract the

unwanted social interaction from overcrowding can be as extreme as exercising social withdrawal. Many times, unfit housing consequences can affect academic performance; elementary students from more crowded homes were found to exhibit higher levels of psychological distress and poorer behavioral adjustment at school (Evans, 2006). With increased risk factors and the prevalence of mental health issues in the environments of youth from an urban housing setting, added green space has been shown to act as a buffer against the disproportionate stressors they face (McCracken et al., 2016; Villeneuve, 2012). From the lowest of exposures, green space has been shown to be psychologically beneficial simply through a view of trees outside of a window (Wells, 2000). Stress and headaches, conditions that regularly affect children from crowded city housing, are cited to be significantly reduced in green space (Villeneuve, 2012). The sanctuary that the outdoors can provide by promoting mental health is connected to McCracken’s (2016) Stress Recovery Theory. This framework suggests that the exposure to and viewing of natural landscapes can reduce symptoms of stress and anxiety, combatting the decreased attention and happiness that is characteristic of built, urban landscapes. By counteracting the detrimental side-effects that urban environments can have on mental health, green space truly can act as a buffer, protecting children against the adverse conditions that are unjustly present in their environment.

Pathways to Academic Competency

Looking to a different cross-sectional interaction of Bronfenbrenner’s (1974) ecological theory, recent urban housing literature has begun to focus on the extent to which a child’s physical environment foreshadows their academic promise (Ainsworth, 2003). A neighborhood’s quality and the educational outcomes of youth residents are significantly correlated, so much so that Ainsworth (2003) cites dropout rates in disadvantaged neighborhoods can be as much as three times as high as those in non-poverty communities. A relationship that can be attributed to increased instances of violence, cognitive development delays, and even decreased nutrition, it is only exacerbated through the institutional phenomenon that schools serving lower-socioeconomic status (SES) children receive

much lower public funding, on average, than those that serve higher-SES children (Arnold & Doctoroff, 2003). Looking to various research on the reasons for the frequent educational failure of inner-city children, Ainsworth (2003) argues that social disorganization experienced in urban neighborhoods can incite social problems that carry over into the classroom, such as the instances of violence, increases in deviant behavior, and lack of constructive opportunities for children to spend time in. Other researchers, like Harker (2006), attribute low-academic performance to direct environmental influences such as housing quality. She explains that overcrowding, mentioned before as a common concern in urban housing, is linked to increased delays in cognitive development. Paralleling Harker's theory, Evans (2006) suggests that noise effects, amplified by crowded urban buildings, can result in delays in reading, as well as long-term memory. He further notes that behavioral problems also present themselves far more frequently in urban-dwelling children. With academic performance highly stratified by neighborhood quality, nature can be looked to as an equalizing agent with the potential to moderate the harsh environmental affects failing countless promising minds in the classroom.

Green space has been consistently cited to promote favorable educational outcomes in youth through various pathways (Jurbergs, Palcic, & Kelley, 2007; McCracken et al., 2016; Schutte, 2015). Research on the effects of green space on attention and cognitive activity in children further supports the idea that natural landscapes positively influence psychological processes. In a study measuring the effects of natural views on low-income girls' levels of concentration, it was found that a simple view of nature, outside of an apartment window, can increase their performance on intellectual tasks (Schutte, 2015). Faber, Taylor, and Kuo's (2009) study shows that attention can be increased after exposing children to a nature walk as opposed to a walk in a built environment (as cited in Schutte, 2015). With a higher incidence of behavioral problems in children from low-quality housing, green space has the opportunity to reduce symptoms. For instance, activities performed in a natural setting have been found to lower the symptoms of youth struggling with Attention Deficit Disorder, or ADD, which is a disorder disproportionately diagnosed in low-

income children (Jurbergs et al., 2007). There is an established correlation between limited outdoor-time and cognitive impairments, suggesting that the urban-dwelling children who live further away from accessible green space are, in fact, more susceptible to illnesses that could impair their academic performance (McCracken et al., 2016). Considering the tendency for symptoms of cognitive disorders to negatively affect productivity, achievement, and information retention, the impact of nature's alleviating effects may be profound for academically disadvantaged youth (Jurbergs et al., 2007).

Unfortunately, a disparity in academic performance emerges very early on in a disadvantaged child's classroom presence. Decreased literacy skills and delays in mathematics upon entering school set the pace for their later school performance, and lower-SES children are likely to remain behind, losing ground before entry, after school days, and during summers (Arnold & Doctoroff, 2003). The long-lasting impacts of a child's socio-economic status on their academic promise is reflected in the lower representation of low-income children in well-paying careers in math and technology later on in life (Arnold & Doctoroff, 2003). The importance of early childhood development is shown through this vicious cycle of academic failure that afflicts low-income youth from the time they enter grade school to the end stage of pursuing a career. In order to promote academic prosperity, there is a need for the mediating effects of green space on the child's harsh physical environment, so that their cognitive and physical development can progress, without degradation.

Why Early Childhood?

Development during early childhood can be defined by the interaction of various factors within a child's indirect and direct influences, as shown in Bronfenbrenner's model. Both beneficial and adverse exposures that a child is subjected to early on can produce small changes in their life course, with the potential to be magnified later on in their development (Hertzman & Boyce, 2010). Specifically, the physical environment of a child's surroundings—the neighborhood and housing in which they grow up—can have varying effects on access to important developmental stimuli. Equity considerations

become inevitable when examining early childhood development comparatively in the populations of children from different neighborhood environments. Emphasizing the environmental affordances provided to both groups, children from low-income, urban backgrounds are disproportionately unable to reach developmental standards, impacting them continuously throughout their lifespan (Siddiqi, Hertzman, Irwin, & Hertzman, 2011). The significant influence that the quality of their surroundings and coinciding opportunities have on educational outcomes make it clear why early childhood is cited as the most important developmental phase in life (Siddiqi et al., 2011).

Hertzman & Boyce (2010) stress the importance of the early years of a child's life, stating that many limited spans of developmental time are at their peak receptiveness during the first three years of life. This stresses the importance of exposing children to the appropriate developmental stimuli during this early childhood phase. The absence of significant resources in urban cityscapes place urban youth at a higher risk of missing a key time in which the brain is actively evolving. As Hertzman and Boyce (2010) point out, the developmental trajectories of children that do not experience these beneficial growth periods are significantly impacted; when the body is no longer maximally receptive to environmental input, circuits and systems solidify permanently, even if that means they are only partially developed or formed.

Continuing Hertzman and Boyce's (2010) discussion on early childhood's potential to affect an individual in the long term, Siddiqi et al. (2011) highlights the socioeconomic consequences of missed opportunities or growing up in an unfavorable environment during this life phase. The authors describe positive educational attainment, income attainment, and social behaviors as strongly dependent on healthy growth that occurs during early childhood. The inequalities that afflict many low-SES children, such as lack of resources, lead to social and economic inequalities later on. Harker (2006) contributes to this idea, as well, stating that the lower educational attainment that many of these children achieve during the first few years of their schooling impacts opportunities in adulthood, like jobs and income, which ultimately can hinder socioeconomic mobility, placing these individuals at

risk for poor health and early mortality. Bad housing is a major risk factor for lower educational attainment, drawing a direct link from a child's neighborhood environment to their economic success as an adult.

Green Resilience

Outlining the negative impacts of a child's neighborhood environment on their health and wellbeing reveals the numerous disadvantages and hardships that many low-income, inner-city children face. Growing up in these inequitable conditions, where many children are disproportionately affected by developmental delays, is no easy task (Christian et al., 2015). Although cited as having the potential to act as protective factors in a child's life, safe play spaces, greater stimulation, and the availability of resources for play and exploration are characteristic deficits of low-income and urban youth, further exposing them to negative life effects (Wells & Evans, 2003). In addition to mediating individual harsh environmental effects of urban neighborhoods through various means, green space has also been shown to promote resilience in children that face adversity or a high concentration of risk factors in their everyday life (Westphal, 2003; Chawla, Keena, Pevec, Stanley, 2014; Wells & Evans, 2003).

Resilience can be defined as an individual's capacity to overcome life difficulties and to persevere even in the face of adversity (Chawla et al., 2014). It reflects internal strengths and is developed dependent on protective factors in a child's environment. With the potential to mitigate negative impacts imposed by neighborhood risk, resilience can be understood to be a significant trait in urban children. Wells (2000) states that researchers are increasingly citing the firm link between environmental buffering factors, such as green space, and the development of resilience among low-income children. She continues to note that green space, acting as a moderator of adverse conditions, serves as a protective factor in a child's natural environment, which contributes to the grit necessary for them to persist in disadvantaged contexts. Wells and Evans (2003) agree with this research, stating that adverse influences of stressful life challenges can be felt less severely in the presence of nearby nature. In the research study that they conducted, the degree of natural landscaping around children's homes was shown to predict the

child's ability to cope with stressful life events—the mediating effect was highest for children who experienced the highest levels of adverse effects.

Implications for Further Research

Through interactions with their environment, children can learn about themselves as well as the world around them. Developing environmental competency in a child's neighborhood setting can be valuable because of the accompanying knowledge, skills, and confidence that they gain in their ability to use the environment for carrying out life goals and personal growth. When green space is available to provide developmental affordances to the youth that utilize it, they are exposed to stimuli that fosters healthy and necessary growth, which is especially valuable if they have other influences in their life that diminish opportunities for development. While research suggests that nature is an asset to fundamental growth during early childhood, the environmental and health injustice of stratified access by socioeconomic status remains an intimidating obstacle to reaching youth in all corners of the world. Communities where public health issues seem to be the most critical are suffering from a lack of access to nature. This exact issue defines the agenda for future research: the implications for urban planning.

Wolch et al. (2014) highlighted an important point in noting that the present method for implementation of urban green spaces is not entirely effective. Attempting to increase well-kept green landscaping in communities of low-income households frequently improves the attractiveness of the real estate, drawing in higher-income families. This then raises housing costs, consequently driving the lower-income individuals out. This process is also known as ecological gentrification. Future collaboration between local residents, planners, and developers is needed in order to facilitate green space provision. One implication of this issue on future research and urban planning is the provision of democracy to those that are known to be the most vulnerable to influences from their physical environment: children. Including children in the decisions for the provision of green space offers them a sense of agency and the introduction of a voice that is rarely heard (Wagner, 2006). The idea of a democratic childhood, an idea frequently seen in

Nordic communities, promotes the child as a capable and valuable individual. Hearing their opinion on what green spaces or additions they yearn for would be an excellent way to assure developmental outcomes would be heightened and children would be satisfied.

If access to green space is indeed a contributor to an overall healthy wellbeing, the lack of nature surrounding urban youth is simply another strike against the low-income children that already suffer disadvantage. Providing overlooked youth with sufficient room to grow would act as one more step towards equal opportunity for all children regardless of socioeconomic status.

References

- Ainsworth, J. W. (2002). Why does it take a village- The mediation of neighborhood effects on educational achievement. *Social Forces*, *81*, 117–152.
- Arnold, D. H., & Doctoroff, G. L. (2003). The early education of socioeconomically disadvantaged children. *Annual Review of Psychology; Palo Alto*, *54*, 517–545.
- Black, M. M., & Krishnakumar, A. (1998). Children in low-income, urban settings: Interventions to promote mental health and well-being. *American Psychologist*, *53*(6), 635–646. <https://doi.org/10.1037/0003-066X.53.6.635>
- Branas, C. C., Cheney, R. A., MacDonald, J. M., Tam, V. W., Jackson, T. D., & Have, T. (2011). A difference-in-differences analysis of health, safety, and greening vacant urban space. *American Journal of Epidemiology*, *174*(11), 1296–1306. <https://doi.org/10.1093/aje/kwr273>
- Bronfenbrenner, U. (1974). Developmental research, public policy, and the ecology of childhood. *Child Development*, *45*(1), 1–5. <https://doi.org/10.2307/1127743>
- Brussoni, M., Olsen, L. L., Pike, I., & Sleet, D. A. (2012). Risky play and children's safety: Balancing priorities for optimal child development.

- International Journal of Environmental Research and Public Health*, 9(9), 3134–3148. <https://doi.org/10.3390/ijerph9093134>
- Chawla, L. (2015). Benefits of nature contact for children. *Journal of Planning Literature*, 30(4), 433–452. <https://doi.org/10.1177/0885412215595441>
- Chawla, L., Keena, K., Pevec, I., & Stanley, E. (2014). Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health & Place*, 28, 1–13.
- Christian, H., Zubrick, S., & Foster, S. (2015). The influence of the neighborhood physical environment on early child health and development: A review and call for research. *Health & Place*, 33, 25–36.
- Evans, G. W. (2006). Child development and the physical environment. *Annual Review of Psychology*, 57, 423–451. <https://doi.org/10.1146/annurev.psych.57.102904.190057>
- Hanscom, A. J. (2016). *Balanced and Barefoot*. Oakland, CA: New Harbinger Publications, Inc.
- Harker, L. (2006). *Chance of a lifetime: The impact of bad housing on children's lives*. Shelter UK. Retrieved from https://england.shelter.org.uk/_data/assets/pdf_file/0016/39202/Chance_of_a_Lifetime.pdf
- Hertzman, C., & Boyce, T. (2010). How experience gets under the skin to create gradients in developmental health. *Annual Review of Public Health*, 31, 329–347. <https://doi.org/https://doi.org/10.1146/annurev.publhealth.012809.103538>
- Jurbergs, N., Palcic, J., & Kelley, M. L. (2007). School-home notes with and without response cost: Increasing attention and academic performance in low-income children with attention-deficit/hyperactivity disorder. *School Psychology Quarterly*, 22(3), 358–379. <https://doi.org/10.1037/1045-3830.22.3.358>
- Kondo, M. C., Fluehr, J. M., McKeon, T., & Branas, C. C. (2018). Urban green space and its impact on human health. *International Journal of Environmental Research and Public Health*, 15(3). <https://doi.org/10.3390/ijerph15030445>
- Kuo, F. E., & Sullivan, W. C. (2001). Aggression and violence in the inner city: effects of environment via mental fatigue. *Environment and Behavior*, 33(4), 543–571. <https://doi.org/10.1177/00139160121973124>
- Lee, A. C. K., Jordan, H. C., & Horsley, J. (2015). Value of urban green spaces in promoting healthy living and wellbeing: prospects for planning. *Risk Management and Healthcare Policy*, 8, 131–137. <https://doi.org/10.2147/RMHP.S61654>
- Maller, C., Townsend, M., Pryor, A., Brown, P., & St Leger, L. (2006). Healthy nature healthy people: “Contact with nature” as an upstream health promotion intervention for populations. *Health Promotion International*, 21(1), 45–54. <https://doi.org/10.1093/heapro/dai032>
- McCracken, D. S., Allen, D. A., & Gow, A. J. (2016). Associations between urban greenspace and health-related quality of life in children. *Preventive Medicine Reports*, 3, 211–221. <https://doi.org/10.1016/j.pmedr.2016.01.013>
- Nutsford, D., Pearson, A., & Kingham, S. (2013). An ecological study investigating the association between access to urban green space and mental health. *Public Health*, 127(11), 1005–1011. <https://doi.org/https://doi.org/10.1016/j.puhe.2013.08.016>
- Romero, A. (2005). Low-income neighborhood barriers and resources for adolescents’ physical activity. *Journal of Adolescent Health*, 36(3), 253–259.
- Schutte, A. R., Torquati, J. C., & Beattie, H. L. (2017). Impact of urban nature on executive functioning in early and middle childhood. *Environment and Behavior*, 49(1), 3–30. <https://doi.org/10.1177/0013916515603095>

- Siddiqi, A., Hertzman, E., Irwin, L., & Hertzman, C. (2011). Early child development: A powerful equalizer. *Improving Equity in Health by Addressing Social Determinants*, 115–141.
- Taylor, A. F., Wiley, A., Kuo, F. E., & Sullivan, W. C. (1998). Growing up in the inner city: Green spaces as places to grow. *Environment and Behavior*, 30(1), 3–27. <https://doi.org/10.1177/0013916598301001>
- Veitch, J., Salmon, J., & Ball, K. (2008). Children's active free play in local neighborhoods: A behavioral mapping study. *Health Education Research*, 23(5), 870–879. <https://doi.org/10.1093/her/cym074>
- Villeneuve, P., Jerrett, M., Su, J., Burnett, R., Chen, H., Wheeler, A., & Goldberg, M. (2012). A cohort study relating urban green space with mortality in Ontario, Canada. *Environmental Research*, 115, 51–58. <https://doi.org/https://doi.org/10.1016/j.envres.2012.03.003>
- Wagner, J. T. (2006). An outsider's perspective: Childhoods and early education in the Nordic countries. In J. Einarsdottir and J. T. Wagner (Eds.), *Nordic childhoods and early education: Philosophy, research, policy and practice in Denmark, Finland, Iceland, Norway, and Sweden* (pp. 289–306). Greenwich, CT: Information Age Publishing.
- Wells, N. M. (2000). At home with nature: Effects of “greenness” on children's cognitive functioning. *Environment and Behavior*, 32(6), 775–795. <https://doi.org/10.1177/00139160021972793>
- Wells, N. M., & Evans, G. W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior*, 35(3), 311–330. <https://doi.org/10.1177/0013916503035003001>
- Westphal, L. (2003). Urban greening and social benefits: A study of empowerment outcomes. *Social Aspects of Urban Forestry*, 29(3), 137–147.
- Wolch, J., Byrne, J., & Newell, J. (2014). Urban green space, public health, and environmental justice: The challenge of making cities “just green enough.” *Landscape and Urban Planning*, 125, 234–244. <https://doi.org/https://doi.org/10.1016/j.landurbplan.2014.01.017>
- Younan, D., Tuvblad, C., Li, L., Wu, J., Lurmann, F., Franklin, M., ... Chen, J.-C. (2016). Environmental determinants of aggression in adolescents: role of urban neighborhood greenspace. *Journal of the American Academy of Child and Adolescent Psychiatry*, 55(7), 591–601. <https://doi.org/10.1016/j.jaac.2016.05.002>