Nature-Based Programming for Children and Youth with Autism Spectrum Disorder: A Community Perspective

text by
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> “Who needs nature? Arguably, we all do.

Ample and growing evidence finds that engagement with nature positively impacts all areas of childhood development. Individuals with autism spectrum disorder experience unique sensory and developmental challenges, which may be buffered through nature experiences. Careful attention to creating Sensory Responsive™ nature-based programming and spaces promotes a concerted community response to meet their unique developmental needs. Achieving the goal of impactful nature-based programming for children and youth with autism spectrum disorder necessitates an interdisciplinary approach that embraces input from the autism community, therapists, educators, designers, and planners.

Children and Nature

Who needs nature? Arguably, we all do. Beginning with Roger Ulrich’s seminal “View Through a Window” study published in 1984, in which he found that patients recovering from surgery whose window view was of nature versus a brick wall had better outcomes, the research on nature and health has literally exploded. Not a month passes that several compelling evidence-based studies are published that confirms the value of interacting with nature, be it to improve physical health, reduce blood pressure and stress, to better focus, to feel less lonely, and to experience hope, to name just a few. Research methodology has become increasingly complex, adding further credence to the important people-nature relationship that we all need and deserve, for the sake of our health and humanity.

A variety of studies looking specifically at children and nature have found that interaction with nature buffers emotional challenges (Vanaken & Danckearts, 2018). Participation in school garden programs empower children to become more comfortable with eating the produce they grow and to educate their families on the value of eating fresh fruits and vegetables (McCormick, 2017).

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Elementary school aged children demonstrate improved cognitive development including working memory and attentional focus in classrooms with green walls and greened areas proximal to school grounds (Hall & Knuth, 2019; van den Berg et al, 2017). Children with greater access to natural play areas have increased rates of immune system supporting bacteria on their skin (Hanski et al. 2012). Living in areas with nearby nature reduces rates of childhood obesity and time spent in front of screens (Dadvand et al., 2014). Physical activity increases when there is close access to parks and gardens (Ding et al. 2011; Shanahan et al. 2016). Motor skills improve when children play outdoors as there is less predictability in outdoor terrain as compared to indoors, hence children must adapt to the varied conditions (FjØrtoft, 2004). This briefest of literature summary only touches on the surface of the important studies linking nature and child health and well-being.

Knowing that nature contact positively impacts children’s physical, social-emotional, and cognitive development, let’s turn the conversation to the role of nature for children and youth with autism spectrum disorder. Studies on how being outdoors and in nature impacts the lives of children and youth with autism and their families show that in rural settings, there is parental concern that there is little opportunity for safe recreational opportunities for their children. In addition, considerations must be made to create inclusive outdoor spaces and programming, as well as to provide adequate training for recreational staff (Shannon et al., 2021) so that their children can reap the benefits of nature. This finding is similar to a study conducted in two Chinese cities where parents identified the physical, social-emotional, and multi-sensory benefits of nature contact for their children with autism spectrum disorder, yet they also identified environmental barriers for equitable engagement such as safety concerns related to the available outdoor spaces and phobias about the spaces precluding return visits to outdoor spaces (Li et al., 2019).

Autism Spectrum Disorder

The current rate of diagnosis for autism spectrum disorder in the United States is 1:54, with a prevalence rate 4.3 percent higher amongst boys than girls (Maenner et al., 2020). Twenty years ago, the prevalence was closer to 1:150 (Maenner et al., 2020). Worldwide the rate of diagnosis is about 1:160, but this number may not accurately reflect the rate of diagnosis in developing nations (Mayada et al., 2012).

Autism spectrum disorder is a developmental disability that is often associated with a genetic prevalence within families. Every child, youth, (and adult) with autism spectrum disorder presents differently, so much so that it has been said that “if you meet one person with autism spectrum disorder, you have met one person with autism.” While there are common characteristics such as difficulties with communication, social skills, sensory integration issues, and behavioral challenges (American Psychiatric Association, 2013), no two individuals with autism spectrum disorder share the exact same severity of characteristics and skill levels. Some children and youth with autism spectrum disorder are highly reactive while others seemingly do not respond to or withdraw from environmental stimuli. Because autism spectrum disorder is highly individualized, it is not surprising that the most effective therapeutic approaches are individualized to meet each child’s unique needs.

Nature and Autism Programming

Thus far, we have established that nature contact and connections improve overall development, health, and well-being and that children and youth with autism spectrum disorder display challenges with communication, behavior, emotional regulation, and sensory integration and need safe and inclusive places to be outside. The best interventions are individualized to meet a particular child's needs. How can all of this translate into best practice nature-based community programming? While it is not individualized in terms of providing specific therapy protocols, there are ways to provide safe and meaningful nature-based community programming.

I believe the key to success is through Sensory Responsive™ programming (and design). As an occupational therapist with a background in human development, I am trained to understand the child (or any client) as a whole being. I know that effective solutions must address the entire child, not just the behaviors, or any physical, sensory, or social issues the child may have. When working with design teams to design spaces and create programming for children and youth with autism, I go right to the sensory systems to address 'the problem.'

Here is why. The five basic sensory systems—auditory (hear), gustatory (taste), visual (see) olfactory (smell), and tactile (touch), plus the three foundational sensory systems—proprioception (body position in space), vestibular (balance), and interoception (internal regulation), guide every single activity in our daily lives from brushing our teeth (taste, smell, touch, hear, see, balance, and movement) to riding a bike (see, hear, smell, movement, balance, touch). They also play a significant role in regulating behaviors and emotions. For most people our eight sensory systems work together and the little things like the whirring of a leaf blower may be annoying, but not enough to lead to a behavioral outburst. Grass may be a bit tickly to walk over and the ground plane may not be as level as we would like but walk on grass we do. When the eight sensory systems are not working in sync, they are not integrated and can lead to a multitude of outcomes like behavioral issues and social skills challenges, common amongst children and youth with autism spectrum disorder. Think about it. A child with autism spectrum disorder and sensory integration issues could be so overwhelmed by the smell of roses that they retreat from a space and refuse to go back, swing so much that they dig a trench beneath the swing with their feet, or rub the bark off a tree trunk from making constant contact.

Left / Fig 1.
Swinging is a favored sensory activity of childhood and youth. (Image credit: R.B. Hansel)

Top / Fig 2.
A combination of varied shades of green, textured leaves, and aromatic qualities enhance the sensory experience in the garden. (Image credit: R.B. Hansel)

Fig 3 & 4.
Navigating over varied types of paving provide proprioceptive, vestibular, tactile, and visual sensory enrichment. (Image credit: A. Wagenfeld)

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Where nature-based community programming happens matters. Avoiding environmental chaos, described by Wach and Evans (2010) as "an environment characterized by high levels of noise, crowding, and instability as well as a lack of temporal and physical structuring (few regularities…)" (p. 5) that lead to "sensory overload" (Fiese & Winter, 2010, p. 49) is of highest priority. While environmental chaos applies to everyone, individuals with autism spectrum disorder are particularly sensitive to chaos and lack of regularity. No matter the quality of the programming, it will not be successful if it is competing with environmental chaos unless the chaos can be addressed through environmental modifications like acoustic and visual mitigations. When possible, plan for programming in quieter places; the edge of a busy town square or a peaceful spot in a park.

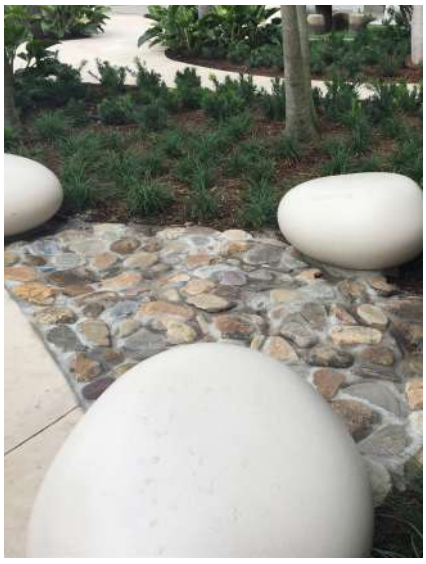
In consideration of avoiding environmental chaos, make every design decision based on the sensory qualities it imbues. A clever interdisciplinary design team can collaborate to successfully create environmentally buffered, Sensory Responsive™ outdoor programming. First and foremost, sensory responsive programming must provide a balance of alerting (for the under-responsive) and calming (for the hyper-responsive) sensory opportunities, to look, touch, listen, smell, move, and balance and perhaps most importantly to regulate internal functions because if you are too hot or cold, thirsty, or need to use the toilet, are you able to function at your best? To program for interoception means providing shelter from the sun and heat, drinking fountains, and places to sit. These experiences need not be cloistered because for instance, in nature a lavender plant has a scent (smell), is a bit sticky (touch), and at least two toned leaves and flowers (sight). What is more important is providing a balanced nature-based experience. Include a balance of alerting and calming sensory experiences such as plants with rough or striated leaves with pointier (not sharp!) tips to alert and smooth leaves with rounded tips to calm. Children (not just those with autism spectrum disorder) will gravitate to the plants that they want to interact with. Be strategic in placing musical instruments on the ground plane, in planters, and elsewhere so children can select (or not) to interact with them while squatting, standing, or even reaching up. Vary paving types and orientation to provide different types of movement experiences. Curves are easier to navigate than angles and offer different movement and balance experiences. Pebble paving provides more movement and balance challenges that concrete pavers. Stepping stones require a bigger challenge than asphalt to navigate. Select plants with colors that pop to alert and plants in the same or very similar hues to calm. Sensory Responsive™ design and programming takes into account that a balanced sensory system helps children with autism spectrum disorder better engage with daily life and to experience the joys of interacting with nature.

Fig 5.
Unlike plants that rustle in the wind, musical instruments provide a means for a controllable hands-on auditory experience. (Image credit: R.B. Hansel)

Equally as important as avoiding environmental chaos is programming for safety. A safe space reduces the caregiver stress burden. Well defined and enclosed perimeters are essential to keep the children inside and caregivers more confident in allowing their children to explore the space on their own terms more independently. To make these enclosures less institutional, 'bury' the fence in dense, sensory rich plantings that provide visual and tactile interest.

While designers are not trained to facilitate sensory integration therapy, as it is a highly specialized neurologically based treatment method that occupational therapists are trained to provide, there is tremendous value in bringing the skills and knowledge of occupational therapy and design (particularly landscape architecture) together at the proverbial design board to create the most effective nature-based community spaces and programming to meet the unique and complex needs of children and youth with autism spectrum disorder. Providing children with autism spectrum disorder safe, inclusive, and Sensory Responsive™ outdoor community spaces represent a step forward in acknowledging that every child deserves to experience the joys of being in nature on their terms and in ways that are meaningful for them.

Fig 6 & 7.
Navigating over varied types of paving provide proprioceptive, vestibular, tactile, and visual sensory enrichment. (Image credit: R.B. Hansel)



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