



## CHILDREN, YOUTH & FAMILY CONSORTIUM

# Presentation at Children & Nature Connection Brown Bag Series



**This document summarizes a presentation made by Judy Myers at the March 14, 2014 brown bag seminar of the MN Children & Nature Connection**

### **BENEFITS OF NATURE TO MENTAL HEALTH MAINTENANCE**

Preschool children's brains and bodies go through tremendous changes. Research supports the belief that outdoor play provides opportunities for problem solving and creative thinking. Outdoor play can provide fewer constraints, less structure, and lots of opportunities for gross motor development through climbing and running. All of these factors induce curiosity and imaginative play and are necessary for optimal brain development. Grahn, et al., looked at children in different day care settings.<sup>1</sup> Children who attended an "outdoors in all weather" day care facility where there were orchards, pastures, and woodlands for play showed better motor coordination and greater attention

capacity than children who attended an urban day-care that was surrounded by tall buildings.

Evidence suggests that green spaces and nature provide mood enhancement and should be seen as a fundamental health resource, but not all children have easy access to these environments. In 2004, world census reports indicated that urban populations had surpassed people living in rural settings for the first time in human history. Lee demonstrates the unhappy situation of many children in poor inner-city neighborhoods:

*Lee often threw tantrums in the doorway when his older brothers went outdoors and tried to fight his way out. Windows were kept shut, and outside doors were locked. Lee was a frustrated child. What he most wanted, active play outdoors with other children, was off limits, literally out of reach. In his attempts to escape, Lee frequently hurt himself. He was characterized as wild, uncontrollable, and potentially dangerous - but he was also helpless and thwarted. He finally exhausted the limited possibilities in his family's two-room apartment and his behavior alternated between frustration and listless withdrawal.<sup>2</sup>*

How safe and green are public housing outdoor environments? Sometimes, what begins as a landscaped area surrounding public housing changes due to reduced funds. One inner city housing project that included more than 20 multi-storied buildings once had trees and grass with

attractive walkways, but as maintenance funds dried up, so did the green space.<sup>3</sup> For ease of maintenance, much of the grassy areas were covered with macadam or concrete. And those few units that had window access to nature were limited to those who were lucky enough to be assigned to those apartments – tenants did not have a choice about where they lived. For children and families already at high stress levels, this was one more frustration.

### **STATISTICAL PERSPECTIVE REGARDING THE INCIDENCE OF CHILDHOOD ADHD, DEPRESSION AND ANXIETY DISORDERS**

For this presentation, the statistical prevalence for children and adolescents diagnosed with one or more of the following disorders were reviewed: Attention-Deficit/ Hyperactivity Disorder (ADHD), depression, and anxiety particularly related to traumatic stress.

ADHD is the most common neurobehavioral disorder of childhood and may affect more than 6 million school-aged children.<sup>4</sup> Recent surveys of parents showed that approximately 11 percent of children 4-17 years of age (6.4 million) have been diagnosed with ADHD as of 2011 and that the average age of ADHD diagnosis was 7 years. However, children reported by their parents as having more severe ADHD were diagnosed earlier.

Children and adolescents also experience high rates of depression, mood disorders, and traumatic stress disorders. According to the National Alliance on Mental Health (NAMI), on any single day about two percent of school-aged children and about eight percent of adolescents meet the criteria for major depression with one in five teens experiencing depression at some point during adolescence.<sup>5</sup> In primary care settings the rates of depression are higher—as many as 28 percent for adolescents. There is less information about mood disorders in young children but preschool depression has begun to attract research interest.

In a large, national survey of adolescent mental health funded through the National Institute for Mental Health (NIMH) about 8 percent of teens ages 13-18 were reported as having an anxiety disorder, with symptoms commonly emerging around age 6. However, of these 13-18 year-old teens, only about 18 percent received mental health care.<sup>6</sup>

Childhood trauma statistics available on the National Child Traumatic Stress Network<sup>7</sup> reveal disturbing data. In a 1997 nationally representative survey of 12- to 17-year-old youth, eight percent reported experiencing sexual assault, 17 percent reported physical assault, and 39 percent reported witnessing violence. In a 2002 longitudinal study of the general population of children and adolescents in western North Carolina found impairments such as school problems, emotional difficulties, and physical problems in more than 20 percent of children who had been traumatized. In those who had experienced more than one traumatic event, the rate was nearly 50



percent. And, in an inner city community, 30 percent of the elementary and middle school children who were surveyed reported witnessing a stabbing and 26 percent reported witnessing a shooting.<sup>8</sup>

### **DISTINCTIVE BENEFITS OF NATURE ON CHILDREN'S MENTAL HEALTH**

Logan & Selhub<sup>9</sup>, among others, refer to nature as a stress buffer of sorts. They report evidence that exposure to nature has the potential to increase resiliency against chronic disease and reduce negative health impacts of emotional stress. Dutch researchers reported that people living with only 10 percent of available green space within a kilometer of where they lived had a 25 percent greater risk of depression and a 30 percent greater risk of anxiety disorders compared to those with the highest area of green space near home.<sup>10</sup>



Much of the nature-based therapy research with children and youth has focused on restoration strategies for improving attention and concentration, enhancing well-being and lowering stress. There is much less literature specifically related to depression and anxiety, but children with depression and anxiety often exhibit some of the same behaviors as children with ADHD. We have a responsibility to provide meaningful and health-enhancing interventions whether or not we know children's mental health diagnoses or specific traumatic stresses, and we know exposure to nature holds benefits for all children.



It is often thought that children who have been diagnosed with ADHD struggle to complete schoolwork. When we consider the difficulties children with ADHD experience, it's not so much that they *lack* attention; it is that their attention isn't *consistent* - they have difficulty maintaining the same level of performance as other children<sup>11</sup>.

While the study of the variability of ADHD is still in the early stages, we can still address the symptoms; children with ADHD tend to have higher risks for depression as well as anxiety and they may have difficulty with relationships. They may feel the pressure to do better but often fail because the standard treatments are not sufficient to manage symptoms.

Behavioral therapy has not shown significant success for children with ADHD and medications don't work for all children and may have serious side effects, including loss of appetite and poor sleep patterns.<sup>12</sup>

What researchers have helped us learn is that children with ADHD show smaller right pre-frontal cortices on Magnetic Resonance Imaging (MRI), and because this is the part of the brain that helps with attention and concentration, even a small anatomical difference may help to explain the attention inconsistency we see with children with ADHD.<sup>13</sup> William James was one of the first researchers to write about the two different mechanisms required for attention - intentional, effortful attention and unintentional or voluntary and effortless attention<sup>14</sup>. This may explain why





children with ADHD can maintain attention on things they find interesting. These activities require the effortless attention mechanism but the more difficult subjects or activities require the more effortful attention that is prone to attention fatigue.

The attention mechanism that requires effort and intention is prone to fatigue and needs restoration. The amount of concentration/attention that leads to fatigue is variable, depending on other environmental stressors (e.g. lack of or interrupted sleep, loud noises, TV or radio playing all night, unsafe/threatening neighborhood, domestic abuse). But restoration such as sleep or gently absorbing activities (nature exposure) allows the directed attention mechanism to recover. This may explain why children with ADHD or attention problems seem to exhibit increasing symptoms of attention fatigue over the course of the school day. One controlled study in 2008 showed that children diagnosed with ADHD showed significant improvement in attention following exposure to a local park compared with children in a less natural downtown setting.<sup>15</sup>

When thinking about the architecture of a school, day-care or community center building, we should consider how this either invites or prohibits nature connections throughout the school day. Schools might consider adding more natural elements outdoors such as plantings around the school that attract birds and butterflies, gardens for flowers and vegetables, physical education classes outdoors, and environmentally based lessons in subjects like math, science, and reading. Indoor spaces can also include natural elements such as quiet spaces with plants, aquariums and/or terrariums, and window views of natural outdoor spaces.

Contrary to old ideas about window views creating distractions for school children, green views from classrooms have the potential to help all children stay on task and increase their cognitive and attention capacities.<sup>16</sup> A 2008 study of 40 schools and more than 400 students found that environmentally based curricula led to more engagement and enthusiasm for learning and higher scores on standardized tests in reading, writing, math, science, and social studies.<sup>17</sup> What research has helped us learn is that if non-ADHD children respond well to attention – restorative opportunities, children diagnosed with ADHD and stress related disorders might also respond well to these opportunities. Perhaps the reason that the natural environment has a more profound impact on children’s health relates to their greater plasticity or vulnerability. Researchers have explored the potential for natural environments to buffer adverse conditions and serve as protective factors that contribute to resilience in children.<sup>18</sup> The benefits of this buffering action seems to be greatest for those children most at risk – those experiencing the highest levels of adverse stress.

Fostering outdoor play requires a broad coalition of players. Parents and health care professionals cannot do this alone. This action will require a broad range of community participants, ensuring that outdoor play spaces are accessible, safe, and developmentally appropriate for all children and that where necessary, there are traffic-calming interventions. The topic of nature and children’s mental health has tremendous implications for urban planning and design. How do we integrate nature and natural settings into places where people are confined for long periods of time such as day-care facilities, schools, hospitals, and prisons. Our challenge is to identify ways in which we can we all participate in promoting natural environments for our communities.

## REFERENCES

- <sup>1</sup> Grahn, P., Martensson, F., Lindblad, B., Nilsson, P., & Ekman, A. (1997). Ute pa dagis (Outdoors at daycare). *Stad and Land (City and country)*, 145.
- <sup>2</sup> Bartlett, S. N. (1997) No place to play: Implications for the interaction of parents and children. *Journal of Children and Poverty*, 3, 43-44
- <sup>3</sup> Kuo, F.E., & Sullivan, W.C. (2001). Aggression and violence in the inner city: Effects of environment via mental fatigue. *Environment and Behavior*, 33, 543-571.
- <sup>4</sup> Kuo, F.E., & Faber Taylor, A. (2004). A potential natural treatment for attention-deficit/hyperactivity disorder: Evidence from a national study. *American Journal of Public Health*, 94 (9), 1580-1586.
- <sup>5</sup> Duckworth, K., (2014). Depression in Children and Teens. Retrieved from [http://www.nami.org/Template.cfm?Section=By\\_Illness&template=/ContentManagement/ContentDisplay.cfm&ContentID=88551/ContentDisplay.cfm&ContentID=88551](http://www.nami.org/Template.cfm?Section=By_Illness&template=/ContentManagement/ContentDisplay.cfm&ContentID=88551/ContentDisplay.cfm&ContentID=88551).
- <sup>6</sup> National Institutes of Health. Anxiety Disorders in Children and Adolescents (Fact Sheet). Retrieved from <http://www.nimh.nih.gov/health/publications/anxiety-disorders-in-children-and-adolescents/index.shtml>.
- <sup>7</sup> National Child Traumatic Stress Network. Facts and Figures. Retrieved from <http://www.nctsn.org/resources/topics/facts-and-figures>.
- <sup>8</sup> National Child Traumatic Stress Network. Facts and Figures. Retrieved from <http://www.nctsn.org/resources/topics/facts-and-figures>.
- <sup>9</sup> Logan, A., Selhub, E. (2012). *Vis Medicatrix naturae*: Does nature "minister to the mind"? *Biopsychosocial Medicine*, 6, 11-21.
- <sup>10</sup> Logan, A., Selhub, E. (2012). *Vis Medicatrix naturae*: Does nature "minister to the mind"? *Biopsychosocial Medicine*, 6, 11-21.
- <sup>11</sup> Barkley, R.A. (1995). *Taking charge of ADHD*. New York: Guilford Press.
- <sup>12</sup> Kuo, F.E., & Faber Taylor, A. (2004). A potential natural treatment for attention-deficit/hyperactivity disorder: Evidence from a national study. *American Journal of Public Health*, 94 (9), 1580-1586.
- <sup>13</sup> Kuo, F.E., & Faber Taylor, A. (2004). A potential natural treatment for attention-deficit/hyperactivity disorder: Evidence from a national study. *American Journal of Public Health*, 94 (9), 1580-1586.
- <sup>14</sup> Faber Taylor, A., & Kuo, F.E. (2009). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Deficits*, 12, 402-409.
- <sup>15</sup> Faber Taylor, A., & Kuo, F.E. (2009). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Deficits*, 12, 402-409.

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<sup>16</sup> Heschong, L., Wright, R.L., & Okura, S. (2003). Daylighting impacts on human performance in school. *Journal of the Illuminating Engineering Society*, 31, 101-114.

<sup>17</sup> Lieberman, G.A., & Hoody, L. (1998). *Closing the achievement gap*. San Diego, CA: State Education and Environment Roundtable.

<sup>18</sup> Wells, N.M., & Evans, G.W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior*, 35, 311-330.