



Research Statistics – Children and Nature

Value of Green Spaces and Connections to Nature

- **Going Outside to Play in Nature Adds Up for ADD Kids** - A study by University of Illinois researchers Andrea Faber Taylor, Frances E. Kuo and William C. Sullivan has revealed that the symptoms of children with Attention Deficit Disorder (ADD) are relieved after contact with nature. The greener the setting, the more the relief. Children actually perform better on schoolwork after those experiences. By comparison, activities indoors such as watching TV, or outdoors in paved, non-green areas leave ADD children functioning worse. More than 2 million children in the United States suffer from ADD. They have chronic difficulty paying attention and focusing on tasks. ADD causes children to be impulsive, prone to outbursts and sometimes to be aggressive. Often their behavior results in family conflict, peer rejection and academic failure. Maintaining trees and greenery near home and encouraging ADD kids to go out and play may be a compelling approach to help ADD kids function better. (Coping With ADD: The Surprising Connection to Green Play Settings, *Environment and Behavior*. Vol. 33 No. 1. January 2001. 54-77.)
- **The Power of Trees - Greenery Boosts Self-Discipline in Girls** - Some of the most startling facts about the relationship between people and trees have come from a series of research studies by social scientists Andrea Faber Taylor, Frances E. Kuo and William C. Sullivan. One of their many findings – the greener and more natural a girl’s view from home, the better she scores on tests of self-discipline. In turn, the greater a young girl’s self-discipline, the more likely she is to do well in school, avoid unhealthy or risky behaviors and to behave in ways that foster success in life.
- **Green Prevents Mean** - A study conducted by the Human-Environment Research Laboratory at the University of Illinois at Urbana-Champaign has shown levels of aggression were significantly lower among people who had some kind of natural setting outside their apartments versus those who did not. Some scientists believe people living under the stress of crowding, high temperatures, and noise suffer from what they call ‘chronic mental fatigue.’ The result can be irritability and impulsive behavior, both important ingredients of aggressiveness. Exposure to green spaces, such as lawns or play areas shaded by trees, can reduce the negative effects of chronic mental fatigue. (Frances E. Kuo and William C. Sullivan, *Environment and Crime in the Inner City: Does Vegetation Reduce Crime?* *Environment and Behavior*. Vol. 33 No. 3, May 2001. 343-367.)
- **Trees for Mental Health** - Horticultural therapist Sheila Taft draws on scientific research when she notes, “As little as four minutes in a garden will start to reduce stress, improve mood, and steady the vital signs.”
- Dr. Roger Ulrich of Texas A&M University found that commuters who drove past green spaces and urban forests on the way to work were **able to perform complex tasks** more

quickly and accurately than those whose commute took them past strip malls and concrete 'Jersey' barriers.

- It has been demonstrated that actual physical contact with nature in a spontaneous and unstructured way enhances learning skills much more strongly than structured or symbolic contact with or experience of nature, especially in children (Kellert 1996, 2005).
- Unstructured contact with nature following periods of structured and focused attention and associated mental fatigue in adults and children, can result in **restoration from such fatigue** and thereby subsequently enhance learning and productivity. Kaplan's (1995) and other's (Chang and Pergn 1998, Hartig et al. 2003)
- **Green Relief - Trees Ease Poverty's Burden in Inner City Neighborhoods** - Trees offer more than a bit of beauty among the built features of the inner city. When trees and other plants are located immediately outside apartments, inner city residents of those buildings cope better with the stress of living in poverty. They also feel more hopeful about the future and manage their most important problems more effectively. The more trees and grass in the common spaces of inner-city neighborhoods, the more those spaces are used by residents. This adds up to more social activities such as visiting, more knowledge about the neighbors, stronger feelings of belonging, and the kind of positive social ties that are the very fabric of a healthy neighborhood. These are some of the research findings announced by University of Illinois scientist Dr. Frances E. Kuo based on a study that compared residents in apartments barren of greenery with residents in apartments with green surroundings.

Research shows other positive traits linked to green surroundings included higher scores on tests of **concentration**, reports by residents of greater effectiveness and less procrastination in addressing life issues, and resident opinions that issues seemed less difficult and longstanding. The conclusion is that exposure to green surroundings refreshes the ability to concentrate, leading to great effectiveness. Even small amounts of greenery such as a few trees and a patch of grass help inner city residents to feel and do better.

- Dr. Wendel at the Center for Disease Control (CDC) reports that **children who play outdoors have more friends.**
- A cross-cultural research study by J.A. Palmer (1993) found that the single most important factor in developing **personal concern for the environment** was positive experiences in the outdoors during childhood.
- Children who regularly have positive personal experiences with the natural world show more **advanced motor fitness**, including coordination, balance and agility (Grahn, 1997, Fjortoft 2001)
- Appropriate interactions with nature help children develop **powers of observation and creativity** (Crain 2001)
- A 2006 Cornell University study, published in the most recent issue of the journal [Children, Youth and Environments](#) revealed the best way to raise children who actively care about nature is to give them lots of time for nature play before they're 11 years old.

- The **development of imagination and a sense of wonder** have been positively linked to children’s early, appropriate experiences with the natural world (Cobb 1997). A sense of wonder is an important motivator for life-long learning (Wilson 1997)
- **Children with ADHD concentrate better after walking in a park.** Researchers Faber Taylor and Kuo found children concentrated better after walking in a park setting as compared to either a downtown or residential setting and that the effect of walking in a park on concentration helped close the gap between children with ADHD and those without ADHD with regard to the concentration measure used and that the effect was similar to that of two common types of ADHD medication. In addition, the authors found that children rated their experiences more positively in the park setting than in the other two settings. (Faber Taylor, A., & Kuo, F. E. (2008). Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders OnlineFirst*.)
- **“Unstructured Free Play Brings Cognitive, Social and Health Benefits to Children**
Unstructured free play in the out-of-doors brings a host of benefits to children —from being smarter to more cooperative to healthier overall. This well-documented article by two physicians builds a strong case for the importance of unstructured free play in the out-of-doors for all age groups, and especially young children. While concerned about the “obesity epidemic” in young children, the authors say that the health benefits from outdoor play are only one aspect of the overall benefits. They suggest that the concept of “play” is more compelling and inviting to most adult caregivers, parents and guardians than “exercise.” The authors cite cognitive benefits from play in nature, including creativity, problem-solving, focus and self-discipline. Social benefits include cooperation, flexibility, and self-awareness. Emotional benefits include stress reduction, reduced aggression and increased happiness. Children will be smarter, better able to get along with others, healthier and happier when they have regular opportunities for free and unstructured play in the out-of-doors. (Synthesis)” (Burdette, Hillary L., M.D., M.S.; and Robert C. Whitaker, M.D, M.P.H. “Resurrecting Free Play in Young Children: Looking Beyond Fitness and Fatness to Attention, Affiliation and Affect.” © 2005 American Medical Association.)
- “Children who experience school grounds with diverse natural settings are more physically active, more aware of nutrition, more civil to one another, and more creative. (Bell, Anne C.; and Janet E. Dymont. “Grounds for Action: Promoting Physical Activity through School Ground Greening in Canada.” © 2006 Evergreen.”)
- *“Outdoor Learning Enhances School Achievement, Self-Esteem and Self-Discipline*
Nature-Smart Kids Get Higher Test Scores- The American Institutes for Research® conducted a study, submitted to the California Department of Education, of the impact of weeklong residential outdoor education programs. The focus was on at-risk youth, 56% of whom reported never having spent time in a natural setting. Comparing the impact on students who experienced the outdoor education program versus those in a control group who had not had the outdoor learning experience, results were statistically significant. Major findings were: 27% increase in measured mastery of science concepts; enhanced cooperation and conflict resolution skills; gains in self esteem; gains in positive environmental behavior; and gains in problem-solving, motivation to learn, and classroom behavior. (Original Research) “Effects of Outdoor Education Programs for Children in California.” American Institutes for Research: Palo Alto, CA: 2005.

- **Nearby Nature Reduces Stress in Children** - This study, reported in 2003, by Cornell assistant professor Nancy Wells, focuses on rural children and finds that even a view of nature — green plants and vistas —helps reduce stress among highly stressed children. Further, the more plants, green views and access to natural play areas, the more positive the results. (Wells, N.M., and Evans, G.W. “Nearby Nature: A Buffer of Life Stress Among Rural Children.” *Environment and Behavior*. Vol. 35:3, 311-330.)

Children’s lack of time outdoors/lack of connection to nature

- Research shows a dramatic decline in the amount of time children spend in the out-of-doors. Sandra Hoffert and John Sandberg (2000) site the following statistics: Between 1981 and 1997, the amount of time U.S. children aged 6-8 spent playing outdoors decreased by four hours per week while the amount of time they spent indoors in school increased by almost 5 hours per week.
- Research by R.A. Wilson (1994) and D.A. Simmons (1994) (based on personal interviews with groups of children varying in age from preschool to age nine) found that the attitudes children expressed towards various aspects of the natural environment (rain, wildflowers, trees, birds) included more expressions of fear and dislike than appreciation, caring or enjoyment.
- S. Cohen and D. Horm-Wingerd (1993) contend that children’s unfounded fears and misconceptions about the natural environment develop when they have very little actual contact with living things and obtain most of their attitudes through the electronic media.
- A “culture of fear” has parents afraid for their children’s safety. Due to “stranger danger,” many children are no longer free to roam their neighborhoods or even their own yards unless accompanied by adults (Pyle 2002, Herrington and Studtmann 1998, Moore and Wong 1997).
- Many working families can’t supervise their children after school, giving rise to latchkey children who stay indoors or attend supervised after-school activities. Furthermore, children’s lives have become structured and scheduled by adults, who hold the mistaken belief that this sport or that lesson will make their children more successful adults (Moore and Wong 1997, White and Stoecklin 1998).
- The culture of childhood that played outside is gone and children’s everyday life has shifted to the indoors (Hart 1999, Moore 2004). As a result, children’s direct and spontaneous contact with nature is a vanishing experience of childhood (Rivkin 1990, Chawla 1994, Kellert 2002, Pyle 2002, Kuo 2003, Malone 2004). One researcher has gone so far as to refer to this sudden shift in children’s lives and their loss of free play in the outdoors as a “childhood of imprisonment” (Francis 1991).

- The Children & Nature Network reports that only 6% of children aged 9-12 play outside in unstructured play in the course of a week.

Lack of Available Green Space or Play Space for Children

- 2002 Harris Interactive Survey reported that 34% of Americans surveyed reported that children in their neighborhoods lack access to a playground or green space.
- According to the first-ever **Gallup** study on playground use in the United States, children and adolescents do not have adequate access to playgrounds and skateparks, despite the proven benefits of unstructured play on their physical and mental development. The Gallup Organization study, commissioned by KaBOOM! and The Home Depot, randomly surveyed 1,200 individuals nationwide on several topics including access to playgrounds and their maintenance as well as the benefits of playground use. Among the findings:
 1. Less than half of American children have a playground within walking distance of their homes;
 2. Sixty-one percent of Americans say simple lack of access to a playground is a barrier to their children playing on one;
 3. One in three people feel there are not enough playgrounds in their community to serve the number of children who live there;
 4. Only one in two households believe the nearest playground is in very good condition and is well-maintained.
 5. Two of three surveyed agree that using a playground is a deterrent to watching television.
- The sample was drawn from the **Harris Poll Online (HPOL) Physician Specialty Panel**. This sample provides an error rate of +/-5.23% at the 95% confidence level.
 1. Three-fourths (75%) of pediatricians surveyed report that the amount of time their young patients spend on unstructured play has decreased in the past 5 years.
 2. According to the pediatricians surveyed, children are spending a significant amount of time in front of the computer or television. Almost all (97%) of the doctors surveyed cited this as a contributing factor.
 3. Other reasons for this decline include the availability of organized sports or activities (75%), that parents are not aware of the benefits of unstructured play (57%), lack of quality play spaces within walking distance to home (50%), and reduction in school-based recess time (44%).
 4. The majority of the pediatricians believe that unstructured play helps build children's social skills and confidence (96%), helps kids from becoming overweight (89%), and helps kids improve problem-solving skills (82%).
 5. The majority of the pediatricians (88%) believe that the availability of quality play spaces for unstructured play is important to children's overall development.
 6. Alarming, almost all the pediatricians surveyed (99%) believe that obesity among their patients has increased over the past 5 years.
 7. Almost all (99%) of the pediatricians surveyed believe that unstructured play has an important role in reducing childhood obesity.

Childhood Obesity and Other Health issues

- **American Association of Pediatrics – Pediatrics Vol. 117 No. 5 May 2006 pp.1834-1842 “Active Healthy Living: Prevention of Childhood Obesity Through Increased Physical Activity”** – Report highlighted the need for “The provision of a variety of physical activity opportunities in addition to PE, including the protection of children’s recess time and requirements of extracurricular physical activity programs and non structured physical activity before, during, and after school hours, that address the needs and interests of all students.” The report also cited “reduction of environmental barriers to an active lifestyle through the construction of safe recreational facilities, parks and playgrounds.”
- **2006 Research study of 1,732 children across Europe.** Summary comment from Dr. Lars Bo Andersen, lead author of the research published in the medical journal, *Lancet*. “Just making sure children play outside will double the amount of physical activity they get.”
- **According to the American Obesity Association,** 15% of children aged 6—19 are considered overweight or obese. More than 10 % of children between ages 2-5 are overweight. Added weight contributes to health problems such as heart disease, hypertension and diabetes.
- Researchers are finding a strong correlation between the amount of time children play video games and their weight.
- Spending two to three hours a day outdoors can markedly lower a child’s risk of developing myopia or nearsightedness, according to a paper appearing in the January issue of *Optometry and Vision Science*. (Rose, K. A., Morgan, I. G., Ip, J., Kifley, A., Huynh, S., Smith, W., et al. (2008). Outdoor activity reduces the prevalence of myopia in children. *Ophthalmology*, 115(8), 1279-1285.)
- **Children’s need for more sunlight and Vitamin D,** a 2009 Harvard Medical School Study reaffirmed previous studies that children ages one to eleven are not getting enough Vitamin D. The study suggests that the lack of Vitamin D is attributable to lack of sun exposure. Too little Vitamin D can increase risks for bone problems, heart disease, diabetes, depression and other ailments.
- **The American Academy of Pediatrics (AAP)** says free and unstructured outdoor play is healthy and essential (AMERICAN ACADEMY OF PEDIATRICS – January 01, 2007)
- **Areas with trees may help prevent early childhood asthma** (Lovasi, G. S., Quinn, J. W., Neckerman, K. M., Perzanowski, M. S., & Rundle, A. (2008). “Children living in areas with more street trees have lower prevalence of asthma.” *Journal of Epidemiology and Community Health*, 62(7), 647-649.)