The Importance of Building Human-Nature Connections: Fostering stewardship through childhood nature experiences.

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Abstract

Childhood nature experience opportunities have decreased due to the loss of nature areas and an increase in indoor technological activities, which have been driven by both childhood preference and parental fears. The decline of nature play opportunities has impacted childhood development, and has caused concern for future generations’ formation of human-nature relationships. Nature experience opportunities are crucial in early childhood to form human-nature connectiveness that remains into adulthood as children are intuitively drawn to natural areas (Aziz and Said, 2012). Play in natural settings provides physical, emotional-social, and cognitive challenges that give children the opportunity to build on healthy development and a relationship with the natural world through multi-sensorial interactions. The way nature is experienced is affected by gender, urban versus rural living, and parental/peer influence, although more research needs to be performed in order to determine how much of an impact such factors have on nature experience. Nature-based playgrounds, nature schools, and ecologically planned parks can help increase childhood nature experiences where opportunities are lacking and fill the gaps when wild nature is inaccessible, since wild nature experiences are still seen as the best quality action in the creation of a strong human-nature connection (Wells and Lekies, 2006). More research is still needed to look into the benefits of early childhood nature experiences and the connection to adult environmental stewardship, as well as the positive role nature-based playgrounds and alternative park landscape and management practices have on the development of environmental awareness.

Introduction

Experiencing nature through physical interactions encourages humans to understand and connect to the natural world, which is the starting point for environmental stewardship that encompasses pro environmental values (Van der Werff et al., 2013). These experiences are especially important in early childhood as they aid healthy cognitive, social, and physical
development (Asah et al., 2012; Taylor, 2002; Wells and Evans, 2001; Wells and Lekies, 2006). Children directly interact with the natural environment through observation and participation with multiple senses, while utilizing the natural environment as the main focus of play and interaction that create long lasting nature connections (Sebba 1991). In turn, adults with these connections understand the need for preservation and restoration of the natural environment since they have created an appreciative relationship to the natural world through their interactions as young children. (Van der Werff et al., 2013; Wells and Lekies, 2006).

Young children today have fewer opportunities to interact with the natural world, and this reduced amount of exposure can have a negative impact. Many children live within cities where natural space has been reduced for human needs, and many of these children are kept indoors driven by either parental fear or an increase in technological entertainment; therefore, missing out on primary nature experiences (Grimm et al., 2008; Miller, 2005; Staemfli, 2009). Children with reduced interaction with the natural world may never develop a relationship to the environment, which could affect future preservation and conservation measures negatively, due to the lack of human-nature connectiveness.

Reduced interactions can be impacted by many factors that affect the quantity and/or quality of a child’s nature experiences. Gender differences, nature experiences in urban areas versus rural areas, and the influence of parental/peer views play a pivotal role in the formation of a child’s potential human-nature relationship. This paper will examine these factors and investigate whether nature experiences in childhood influence human-nature connectiveness in adulthood, while also exploring the positive impacts that nature has on childhood development as they form a relationship with the natural world through play.
Background

Biodiversity loss

Opportunities to interact with the natural world have decreased compared to past generations, in part because urban sprawl has reduced wild spaces, fragmented wildlife corridors, and decreased flora biodiversity (Grimm et al., 2008; Miller, 2005; Staemfli 2009). As a result of decades of poor urban planning and development with regards to biodiversity preservation and conservation, much of the remaining floras and faunas within urban areas are low in species diversity and includes a variety of invasive species (Miller, 2005). Diverse nature areas, such as in state parks or wild spaces, are often found in distant patches that may require access via means of transportation, which may impede children from opportunities to experience such natural environments.

Urban parks are the closest green spaces children living in cities can experience, but many parks lack aesthetic and floras and faunas quality provided by wild spaces. Urban planning and development has flourished, although it has not incorporated concern for the preservation and conservation of biodiversity (Miller, 2005; Thompson, 2002). As a result, the majority of urban green spaces have large strips of grass with a few trees that provide the same aesthetics your-round (Baines, 1999; Thompson, 2002). Children’s experiences within urban parks are, therefore, less distinct compared to diverse wild spaces where different species offer a variety of tactile experiences, while offering more opportunities for children to explore and interact with the natural world.

Parental fear

Opportunities for children to explore the outdoors have declined due to increased traffic that has risen alongside rising populations within cities. The rise in automobile traffic has created neighborhood environments that don’t provide a foundation for safe outdoor playtime and has
increased parental safety fears (Carver et al., 2008; Clements, 2004; Gaster, 1991; Moore, 1997). Many children are forced to stay indoors by their parents because they fear for their children’s safety while playing outdoors or walking in the neighborhood unsupervised (Wyver et al., 2010). Parents want their children to be supervised at all times but parents are often too busy to provide the supervision they see fit. In turn, children are forced to find activities to do indoors, which tend to be sedentary activities involving technologic entertainment other than active activities that incorporates developmental competency as a whole.

In addition, parental fear has also been driven by technology where a wide access to multiple forms of news media are available that emphasize topics related to crime, violence, and danger (Altheide, 1997). The news media has helped aid in child abduction fears that has resulted in children being overprotected; thus, in turn, hindering a child’s freedom to explore the outdoors independently for fear of abduction (Kitzinger, 2002).

**Technology**

Parents don’t blame themselves entirely for the increase in indoor activity, but rather many blame the heightened popularity of technologically driven activities such as television and video games in playing a large part in lowering outside play opportunities (Clements, 2004; Miller, 2005). It is unclear if the rise in technologically driven activities was aided by the increase in parental fear, but what is known is these preferred sedentary activities can have a negative effect on a child’s development through lowered self-motivation, vision and language impairment, crippled imagination, and decreased patience and concentration (Cordes & Miller, 2000). Parents lacked the multitude of technologic formats of their children causing a parental struggle on how to manage and judge a child’s time spent using technology (Plowman et al., 2010). Ultimately, the increase in indoor technological play is affecting children, whether children are preferring technological indoor play activities due to increased parental fear or an increase in preference.
Impacts caused by increase in technological activities have swayed childhood opportunities to experience nature and build a human-nature relationship. Current technology, which is expected to advance in the future, include simulated environments for individuals to experience nature in their own homes, but these experiences are missing many sensorial contexts. Real experience in nature provides multi-sensory interactions that simulated technology has yet to achieve and has degraded the emotional value of real experience. The purpose of simulated environments is to help promote nature awareness and preservation, but the focus is on national parks, and, in turn, it has reduced support for local green spaces that are a key to biodiversity and ecosystem health (Levi and Kocher, 1999). Experience in nature is still the best means of helping to build human-nature relationships.

*Nature-deficit disorder and environmental generational amnesia*

The impacts on children from the lack of nature connections and experience opportunities have decreased due to increased technological activities and safety concerns have affected many children through the U.S. A childhood with little experience to nature has negative affects to the wellness of the child causing a negative correlation between decreased outdoor play and increased diagnoses for childhood obesity and ADHD that has been termed *nature-deficit disorder*. *Nature-deficit disorder* is not a registered medical diagnosis, but is used as an over-all label to be brought to society’s attention to emphasize that children are experiencing a loss from the lack of nature experiences and, subsequently, a further loss to the environment as these children grow into adults who lack nature connectiveness (Louv, 2008).

Experiences with the environment a child has through their growth into adulthood creates a lasting view to which will be compared to as an adult. *Environmental generational amnesia*, in which the experience a child has with the environment around them becomes the normal, acceptable base standard for all future comparisons (Kahn Jr., 2002). If children are used to having fairly large quantities of pollution, or small quantities of wild areas, then these will be the
base standards in which pollution can increase or wild areas can decrease, instead of putting the base standard at zero pollution or quantity of wild areas before settlement. Increasing a child’s experience with the environment to provide a variety of views, while also including past knowledge of what was before, can help lower environmental generational amnesia impacts.

The impacts from both nature-deficit disorder and environmental generational amnesia start in early childhood, and both are related to experiences associated with the environment. Increasing childhood opportunities to play and explore the outdoors can help to create a relationship to the natural world, increase physical activity, and improve base standards for pollution and wild areas. Future preservation and conservation advocates will need to have a lowered pollution base standard, a higher wild areas standard, and a good human-nature connection to carry out these measures to fulfill environmental needs.

**Childhood: the crucial time for nature experiences**

Early childhood is the prime time to start the formation of empathic abilities and human-nature connections that are carried into adulthood. Children begin to observe the world around them at birth, and these multi-sensory experiences help stimulate the brain and form connections. Nature provides an array of multi-sensory experiences, and provides children the opportunity to engage with an environment that interacts during cause and effect experimentations; thus, helping to understand causal effects through multi-sensory evidence (Chawla, 2007; Gopnik and Schulz, 2004). Children learn best through experience as they form hypotheses and experiments when trying to figure out the world on their own. In experiencing nature through contact and interaction children are able to form engraved memories and a human-nature relationship.

Childhood experiences have a lasting impact on adult behavior and are the building blocks that make an individual, which is why experiences weigh heavier on the formation of behavior than knowledge (Hunt, 1944; Rutter, 1984). In the early 1970’s, early linear models
show environmental knowledge can increase environmental attitudes that consequently increase pro-environmental behavior, but these models have been debunked (Kollmuss and Agyeman, 2002). Increasing an individuals’ environmental knowledge alone won’t have an increase on their pro-environmental attitude or behavior (Cheng and Monroe, 2012). For this reason, the formation for adults’ positive relationships, attitudes, and behaviors with the natural world is rooted in past experiences with the environment (Hinds and Sparks, 2008). Experience is needed before knowledge can proceed, and experience can aid in understanding and awareness during the educational processes.

Individuals having childhood experiences involving play in nature develop positive attitudes and memories towards nature, which leads to environmental activities in adulthood (Bixler et al., 2002). In fact, individuals who never visit wild places as children have a decreased chance of visiting as adults (Thomspson et al., 2008; Yoesting and Burkhead, 1972). Adults revisiting their favored nature spots bring their children with them to have the same experiences as they had, which can help reinforce future generations of adults having positive environmental attitudes towards nature to form lasting human-nature connectiveness.

**Play in Nature**

Play in nature provides a setting where healthy child development can take place, and is one of the most beneficial learning experiences in early childhood, especially when it is child directed (Ailwood, 2003). Risk play is an example of one of the many different types of play a child can experience while playing in natural settings. Risk play involves surroundings where children have the potential to injure themselves or be injured by an object(s), which gives children the opportunity to encounter risky situations that provide them a chance to build better judgment (Hansen Sandseter, 2009; Wyver et al., 2010). Natural settings accommodate many opportunities for play involving risk compared to modern playgrounds, and children are drawn to play areas that provide challenges (Aziz and Said, 2012; Brussoni et al., 2012). These
challenging and risky opportunities have been shown to provide many benefits to physical and
cognitive development. Having a good sense of risk judgment helps children build on their
perceptual abilities and through cause and effect learn how to regulate their play in dangerous
play environments or activities, since children who injure themselves learn from their ill
judgment (Brussoni et al., 2012).

Risk play is often associated with independent play that provides children the chance to
explore their surroundings independently from adults and develop a sense of place. Just as
infants and toddlers are encouraged to explore their surroundings to help build their
independence, exploration outdoors as children get older can help further build independence
(Bixler et al., 2002; Passini, 1980; Webley, 1981). Independent play in nature helps children
acquire the knowledge of how they fit in their surroundings, and having a good sense of how one
fits into the natural world is correlated with individuals who have positive environmental
attitudes (Schultz, 2000).

Providing the most opportunities for children to experience nature can have a positive
influence on their development. Play in nature promotes pretend play, which has a multitude of
cognitive benefits including joint planning, self-regulation, problem solving, and goal seeking, as
well as enhancing social and linguistic skills (Bergen, 2002). It is theorized that pretend play
triggers many parts of the brain and that is why it is so beneficial to child development.

Another beneficial aspect of developing strong ability to pretend is being able to take
a different perspective and build on abstract thought (Bergen, 2002). Helping children build
abstract thought and a strong imagination can help in the formation of empathy, because the
ability to take perspective is needed to acquire empathy. Children who acquire a higher
perspective intelligence have an increased chance of becoming environmentally concerned
adults, since they would have greater empathetic capabilities to be able to take perspectives that
are different from their own (Schultz, 2000).
Factors That Impact the Way Nature Is Experienced

Gender differences

There are often gender differences in childhood play. Girls tend to play in mainly fantasy scenarios, single role play (i.e. riding a bike), unstructured play, and in small groups, while boys tend to play in large groups, have team coordination with rules to the play, and are more likely than girls to pretend to be objects (Carlson and Taylor, 2005; Lever, 1978).

One important difference the way nature is experienced is that girls are more likely to take part in fantasy play, physically using little to no objects to help assimilate their play experience, while boys are more likely to use and manipulate objects during play and have utilitarian views for imaginary animals. As a result boys may incorporate more materials from the environment than girls during nature play and may use these materials to build and manipulate their surroundings. Girls would more likely use nature as their backdrop for their fantasy play imagining trees and rocks to be something else, participating in flower picking, and imagining to be an animal (Nabhan and Trimnle, 1994).

Society has had an impact on the freedom of play for boys and girls, which can impact their degree of exploration. Males tend to have more independent play, and explore farther from home than girls. Males have this increased freedom due to many parents stereotyping that boys will be safer while girls are more vulnerable so they need to stay closer to home to be protected. Nature can be experienced close or away from home if the home has a yard or garden, but girls are hindered in their development for spatial awareness from not being permitted to go on explorations far from home (Aziz and Said, 2012; Nabhan and Trimnle, 1994). In this way, society treats boys and girls differently on their independence to explore the natural world causing nature experiences to differ; therefore, girls are forced to interact with what the garden offers and boys are filled with a sense of freedom to find a nature experience they are in search of.
Men and women’s attitudes towards nature are similar to childhood attitudes of play within the natural environment. For instance, men in general tend to have a more utilitarian view towards the environment, while women tend to have a more moral view as their play involves much fantasy that includes pretending to be an animal that enables them to have heightened empathy. Men and women never outgrow their unique ways of viewing and interacting with the environment, but adulthood education can help to increase an individual’s knowledge and attachment towards nature (Kellert and Joyce, 1987; Nabhan and Trimnele, 1994). As adults, our views and attitudes towards nature can be positively changed through environmental education, but the childhood experience still plays a crucial role in the formation of human-nature relationships.

City vs. rural living

Nature experience in childhood can be impacted by the place in which one grows up and resides. Individuals who live within a city have been shown to be aware of their environmental responsibility, but have decreased positive environmental attitudes and connections, while individuals who live in rural environments have an increased chance of having good environmental values, an increase in positive environmental attitudes, a stronger nature connection, and tend to act in an environmentally conscious way (Berenguer et al., 2005; Hinds and Sparks, 2008). Perhaps being surrounded by wild nature helps reinforce the importance of nature and gives a better sense of one’s role within the environment; thus, improving their human-nature relationship. City residents tend to have an out-of-site and out of mind way of living, in which the environmental consequences caused by the actions one takes are not directly seen, and wild places are viewed as a recreational activity or retreat.

Additionally, urban neighborhoods have provided fewer supportive foundations for safe outdoor play for children and, in turn, have lowered urban childhood access to the outdoors within their neighborhood (Gaster, 1991). The decline in outdoor playtime is a large factor in
why urban children score lower than rural children in having positive attitudes and values towards nature (Bunting and Cousins, 1985). Rural children have more opportunities to have access with the outdoors, due to lower traffic density around their homes, and the proximity to wild nature at or near their homes gives greater chance for fostering nature relationships.

*Parental/peer influences*

Children’s opportunities to experience nature are heavily influenced by their parent’s attitudes and values toward the natural environment, as well as their peers’ attitudes and views, and rural children tend to uphold their family values much more than children who live in urban areas (Bunting and Cousins, 1985). Rural children have far less outside influences, such as advertisement, than urban children, where streets, schools, buses, stores, and homes are filled by advertisements that may favor technological activities, or activities that don’t involve nature experiences such as movie theaters or amusement parks.

Opportunities for outdoor play can be further impacted if parental preferences are for sedentary activities or if parental views toward nature are negative (Bixler et al., 2002; Gronhoj and Thogersen, 2012). Parents who don’t have a relationship with nature, or fear it, don’t spend time in the outdoors and parents are children’s first teachers. Parental comments made toward the natural world, or even the lack of acknowledgment, are seen and heard by the child who grows to assume this is the norm.

As children get older they start to spend more time away from their parents and with their peers, so if parents have a negative view towards the environment children can still have a positive attitude towards nature through the positive influence of their peers (Bixler et al., 2002; Chawla, 1992; Gronhoj and Thosersen, 2011). Peers can help provide outdoor play opportunities for children coming from a family background that lacks positive environmental attitudes. During pre-adolescence and even adolescence, children want to be just like their friends and have a strong yearn for group conformity, which is why childhood peers are highly influential on
social rules and values (Lombardi, 1963). Peers can help fulfill nature experience opportunities for children who are severely lacking due to low parental involvement, to include nature experience opportunities such as joining friends’ family camping trips or even just playing in their backyard.

**What Makes a Quality Nature Experience?**

For children to get a quality nature experience, the environmental setting should have certain qualities. To start, the area should have variation and diversity in both topography and vegetation, which helps provide a complex experience. With a complex environment there are more opportunities for children to play and challenge themselves, in which aids in cognitive, physical, and emotional-social development. Included within a diverse environment are more chances for children to encounter risk play where they are able to challenge themselves physically and cognitively (Fjortoft and Sageie, 2000). Secondly, diverse floras structures that vary in topography can provide a multitude of options for children to play, such as climbing trees, pretend play, and construction play. Nature settings that provide quality experiences provide a multitude of play opportunities and stimulating experiences that capture all types of interactive interests and early childhood developmental growth.

Lastly, a setting that provides a quality nature opportunity is one that provides a positive experience (Borge et al. 2003). Providing a positive experience makes the development of the human-nature relationship grow because it was enjoyable and pleasant, brings fond memories of attachment, and gives a child a sense of place (Schaffer and Kistemann, 2012). A child who grows up to fear components of the natural world will avoid environments where such fearful components are present. Having positive views helps to encourage an individual to explore the outdoors, to discover their place within the natural world, and to form a human-nature connection.
Ways to Increase Nature Experience Opportunities in Childhood

Nature schools

Nature schools, or forest kindergartens, are popular in European countries such as Germany, Norway, and Britain, where early childhood nature experiences are seen as vitally important in the building of positive human-nature connections. These schools, often preschools and kindergartens, are based in national parks where every day, rain or shine, the children walk or hike to a different nature spot. These schools are child-directed schools where the curriculum is based on childhood interests and questions, and often the natural environment provides many opportunities for new questions and curriculum ideas. (Borge et al., 2003; O’Brien and Murray, 2007; Schaffer and Kistemann, 2012).

The reason why nature schools function so well for early learning is because the learning takes place within the natural environment. These schools are based on constructivist theory learning in which children learn as they interact and try and make sense of their surroundings. This learning process is much more socially involved in that interactions between child and teacher, and child and child, take place in higher quantities (Savery and Duffy, 2001). This way of learning helps aid in building human-nature relationships as children acquire their understanding and knowledge through a multi-sensory experience within wild nature as they begin to receive answers to their questions to form a personal experience through each’s own differential understanding.

The special and spiritual way that nature schools provide knowledge can help provide more opportunities for U.S. children to have nature experiences, although it may not be an option for every family. To start, parental involvement is much higher than in a regular school, and many parents are asked to help the teacher in supervision. Since many are in wild areas, a low child to adult ratio is needed in case of emergencies where one or more adults may need to leave to get help, while the other(s) stay behind with the children. Since many parents work they may
not be able to volunteer their time, which may have an economic stigma in that only certain families will be able to take advantage of this kind of school (Schaffer and Kistemann, 2001).

**Nature-based playgrounds**

Nature-based playgrounds in traditional school settings, or even neighborhood parks, can be another option to help increase childhood opportunities to experience nature, while gaining the positive developmental benefits from nature play for children who don’t have the luxury to attend a nature school. Nature-based playgrounds include a compilation of trees, grass, sand, water, dirt, rocks, and shrubs, which provide opportunities for nature to be incorporated into a child’s daily routine. Incorporating natural material opens up a chance for living organisms to make their way into the play setting, which provides opportunity to observe, wonder, and explore the diverse living organisms present.

In this way, nature-based playgrounds help to mimic a multi-sensory experience with the incorporation of different tactile experiences found in natural settings, while children acquire benefits such as increased socialization, increased physical development such as coordination and balance, and an increase in imaginary play (Black, 2006). Traditional playgrounds don’t hold a child’s attention for long, and play is often interrupted, while children who play in nature-based playgrounds play the same thing for longer periods that can continue over into the next day (Fjortoft, 2004; Louv, 2008). Just like natural play settings, nature-based playgrounds are experienced in much the same way in that they provide multi-functional opportunities to enhance a child’s interest and keep them occupied for long periods of time.

Nature-based playgrounds are slowly becoming popular in schools and neighborhood parks, since more and more adults are becoming aware of the negatives associated with young children’s lack of nature experience opportunities. Portland, Oregon’s Westmoreland Park was refurbished into a nature-based playground in efforts to help increase childhood opportunities to experience the natural world. The park incorporates environmental science for children to learn
as they play, such as the addition of a concrete channel with water pumps for children to manipulate the water flow. Nature-based playgrounds offer great nature experience supplementation to children within cities, but the cost to build such a park is costlier than a traditional one due to the materials and maintenance (Anderson, 2014). The quality of nature-based playgrounds is much higher, and more highly beneficial to child development and to fostering human-nature connectiveness than traditional playgrounds.

Backyards and gardens

Childhood experience in wild nature is still the most effective influence on adult environmental attitudes, but other forms of nature (i.e. backyards, gardens, parks, etc.) still can play a small part to help replace missing wild nature experience opportunities (Wells and Lekies, 2006). Not every household has a backyard, but the ones that do can have an opportunity to experience nature every day. Although many backyards may resemble poorly planned landscape parks, they can still provide a chance for children to have a multisensory experience with grass, dirt, leaves, trees, rocks, bugs, birds, etc. Experiencing nature through a backyard can help many children whose parents are overprotective, have work obligations, or who are low income and have little access to transportation.

Having a backyard garden can also help increase the quality of nature experience within a home. Gardens have the potential to help foster connections to nature, and create a connection that is unique to each individual (Bhatti and Church, 2001). Gardens are seen as a child-friendly activity that can help develop better social skills, and gain a better sense of how humans fit into and affect the ecosystem (Laaksoharju et al., 2012). As children watch their plants grow from seed they discover many ecological processes which further aids in the child’s understanding and curiosity of their placement within the system. In a way, a garden is a miniaturized opportunity for a nature school within a home and with enough parental involvement to help guide the child’s questions and concerns a quality nature experience is provided.
Park restoration and management

The increase in urban development has had a negative impact on the quality of most urban ecosystems, even though the ecosystems in urban areas are just as important to protect and restore as the ones found in wild nature (Niemela et al., 2010). Implementing a new form of landscape design for urban green spaces that can help increase biodiversity as well as support local ecosystems through sustainable management and conservation biology practices, can help increase quality nature opportunities within urban areas (Deardorn and Kark, 2009; Niemela et al., 2010). Providing diverse, sustainable, and native natural green spaces within the city provide human and ecological benefits, such as noise reduction, micro climate regulation, and air filtration, along with quality nature recreation (Bolund and Hunhammer, 1999). Restoring urban parks to a diverse area close to its natural state is the best option, although there are many difficulties in the restoration and implementation process associated with stakeholder issues: landscape design, habitat protection, recreation, and individuals who yearn for full restoration to an exact pre-settlement landscape (Gobster, 2001).

Parks today need to include multi-use attributes due to such diverse stakeholder expectations, and individuals within cities have multiple uses and needs from parks that involve cultural, ecological, and human wellness criteria. Recent park planning and management knowledge has come to a better understanding involving urban planning needs to incorporate ecological roles, and better planned and managed parks to help increase a city’s ecological services, as well as to represent the natural world in which human beings are an integral part of (Boland, 2001). Many cities are taking the lead in creating ecologically sound landscape parks, and are turning abandoned railway yards into multi-functional parks, which serve as wildlife corridors, safe pedestrian and bicycling routes, art and cultural facilities, and a place to foster healthy well-being and human-nature connections. In Queens, New York, the city plans to turn a 3.5 mile long abandoned rail line into such a parks, and plans on keeping many of the already existing flora that have established themselves during succession (Foderaro, 2014). Development
of the new park, called “QueensWay”, will consist of keeping a “wild” feel to the park, which will also provide a safe pedestrian path that is linked to many other parks within the area. Chicago also plans to turn their 2.5 mile elevated abandoned rail lines into an ecological park, called “Bloomingdale Trail”, that will serve as a nature refuge for locals as well as a trail that leads to other city parks, and a wildlife corridor that will consist of 125,000 newly planted trees and shrubs (Rotenberk, 2013). Both of these examples are implementing a new park planning and management regime where parks are being built to represent native wild areas and floras are being planted that require little management. These parks offer a prime opportunity for quality nature areas for city children, and individuals of all ages, to connect with the natural world close to home.

Conclusion

The need for an increase in nature experience opportunities for children to develop a relationship to nature is crucial in the formation of human-nature connectiveness that is carried with them into adulthood. It is clear that children today are lacking in opportunities to experience nature and access to the outdoors to begin their path in building their own human-nature relationship. Increased fear for childhood safety and technology-based activities both play central roles in hindering children’s opportunities for nature experiences, especially for children living in urban areas where the increase in human population has caused a decrease in quality nature experiences and an increase in automobile traffic and child abduction fears (Carver et al., 2008; Moore, 1997; Clements, 2004; Gaster, 1991; Wyver et al., 2010; Altheide, 1997; Kitzinger, 2002). This decrease in nature experience opportunities has brought about negative developmental impacts on children that has been brought to attention through such labeling terms as nature-deficit disorder (Louv, 2008).

Childhood play in nature can help to reverse symptoms caused by lack of earlier nature experiences, while also aiding in healthy cognitive, social, emotional, and physical development
(Bergen, 2002; Hansen Sandseter, 2009; Staempfli, 2009). Play in nature is a multi-sensory experience and it provides a variety of play opportunities that support the full spectrum of child developmental needs. Through increased physical challenges, risk play, increased socialization, and increased imaginary play children begin to practice using mental abilities needed for future academic achievement (Acredola, 1982; Bixler et al., 2002; Kaplan, 1976; Passini, 1980; Webley, 1981).

Gender plays a role in providing opportunities to experience nature, and also impacts the way nature is experienced through play. Boys tend to have a utilitarian approach to play in nature using materials around them, while girls become a part of nature through their pretend play (Nabhan and Trimnle, 1994). The way boys and girls play in nature is carried into adulthood, and forms adult environmental views. There is a correlation to boy utilitarian play to man utilitarian attitude towards nature, as well as girl pretend play building perspective ability that enables them as women to have strong empathetic abilities; thus, forming positive environmental morals and attitudes (Schultz, 2000).

Outside influences, such as parental fear and gender bias, urban versus rural living, and parental/peer influence, impact the type and opportunity of nature experience. In general boys are allowed to explore far from home and girls are told to stay close, female opportunities for nature exploration are limited (Aziz and Said, 2012; Nabhan and Trimnle, 1994). Rural children have wild nature close to home, and have frequent access that helps in the formation of positive environmental attitudes and human-nature connectiveness, while urban children have little access to wild nature, and their nature opportunities are very limited to domestic areas, such as backyards and parks (Bergenguer et al., 2005; Hinds and Sparks, 2008). Parental values impact environmental views and nature opportunities for children but can be redirected by peer influence (Bunting and Cousins, 1985; Chawla, 1992). Quality experience in nature is full of a variety of opportunities, which is why it is understandable for there to be a variety of outside influences on how childhood nature experiences are obtained.
Quality nature experiences can be found in areas other than wild nature, such as backyards, nature-based playgrounds, or neighborhood parks that were built with landscape ecology in mind. Quality nature areas must have a variety of tactile experiences available, involve multiple senses, provide opportunities for exploration and freedom, and have a diverse floras topography (Borge et al., 2003; Fjortoft and Sageie, 2000). Play in backyards, nature-based playgrounds, or a quality neighborhood parks should be seen as gap filling opportunities for children to experience nature when they don’t have the opportunity to experience wild nature settings, due to that fact that experiences within wild areas have a larger impact on the formation of human-nature experiences than more domesticated nature settings (Wells and Lekies, 2006). Domesticated nature experiences are complimentary to wild nature experiences by providing a chance to connect with nature to keep consistency in the formation of human-nature connectiveness.

Although there has been research on the positive benefits nature has on childhood development and nature relationships through a child’s experience and interaction in these settings there still needs to be more research; specifically research that investigates the children of the U.S., since many studies involving the benefits of childhood nature experiences take place in European nations (Chawla, 1998; Cheng and Monroe, 2012; Hinda and Sparks, 2008; Kahn and Kellert, 2002; Moore, 1997; Wells and Lekies, 2006; Yoesting and Burkhead, 1972). Also, continued research on the benefits of nature-based playgrounds and how they can help fill in the gap in nature experience opportunities should be examined as nature-based playgrounds are a relatively new concept and there are few data on the topic.

Continued stewardship in the form of protection, preservation, and restoration of wild areas is crucial for future generations to form quality human-nature relationships. For these measures to be carried out throughout the generations children need to obtain substantial opportunities involving outdoor play and exploration experiences, while also providing chances to engage and interact within wild nature settings to ensure human-nature relationship formation.
Early childhood is the starting point for the formation of human-nature connectiveness and efforts should be made to enlighten educators and parents to the benefits nature play and experiences have on child development and the human-nature relationship that are pathways to adult environmental stewardship.
References


