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The Misdiagnosis: Rethinking "Nature-deficit Disorder"

Elizabeth Dickinson

This study examines and critiques "nature-deficit disorder" (NDD), Richard Louv's popular theory of how and why children are alienated from nature. Specifically, I explore NDD within the context of one forest conservation education program that aligns with and operationalizes Louv's message. Underlying Louv's and forest educators' discourses are culturally specific assumptions about human-nature relationships. Both evoke a fall-recovery narrative—that children are separated from nature and must return—and promote science and naming to reconnect. I argue that, in the absence of deeper cultural examination and alternative practices, NDD is a misdiagnosis—a problematic contemporary environmental discourse that can obscure and mistreat the problem. I call on adults to rethink human-nature disconnectedness by returning to the psyche, digging deeper to the problem's cultural roots, and using nontraditional communication practices such as emotional expression and non-naming.

Keywords: Nature-deficit disorder; Forest conservation education; Environmental education; Fall-recovery narrative; Science; Naming

Many adults believe that children today have a troubled and alienated relationship with nature that differs from past generations. Child-nature disconnectedness is often attributed to modern issues such as development, fear, and technology (Hofferth & Sandberg, 2001; Louv, 2005; Malone, 2007). Urbanization, anxiety, and disconnectedness are certainly apparent, and it appears youth today spend less free time outdoors. The effects are thought to include physiological, emotional, and social problems, with dire repercussions for how children understand and treat nature. To address the problem, many adults believe that spending more time "in nature" positively benefits children's mental and physical well-being (Fraser, Heimlich, &

Elizabeth Dickinson (Ph.D., 2010, University of New Mexico) is an Assistant Professor of Communication in the Kenan-Flagler Business School and an adjunct faculty member in the Curriculum for the Environment and Ecology (CEE) at the University of North Carolina at Chapel Hill. Correspondence to: Elizabeth Dickinson, Communication Area, Kenan-Flagler Business School, The University of North Carolina at Chapel Hill, 4719 McColl Building, Chapel Hill, NC 27599, USA. Email: eadickins@gmail.com

Yocco, 2010). Underlying this belief are deeply embedded cultural assumptions that guide communication and educational practices and influence humanature[1] relationships.

Here, I examine one popular alienation discourse that adults use to communicate assumptions about human-nature relationships, culture, and pedagogy—"nature-deficit disorder" (NDD). In his 2005 book, *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder,* Richard Louv draws from ADD/ADHD popularity and uses NDD as a catchphrase and medical diagnostic metaphor to investigate child-nature disconnectedness. A *New York Times* bestseller and the 2008 Audubon Medal recipient, the book has received much media and popular attention and is one of Algonquin Book's most successful non-fiction books. Numerous educational, public, and activist organizations tap into and support NDD's message and have hired Louv to speak; each uniquely interprets and uses NDD to serve its mission.

As one example, forest agencies incorporate Louv's message. In response to Louv's book, the US Forest Service launched a "More Kids in the Woods" campaign, and forestry officials appropriate Louv's message (Kimbell, Schuhmann, & Brown, 2009; USDA Forest Service, 2009, 2010). Among other programs, Louv supports forest conservation pedagogy. I researched one such forest conservation education program that aligns with and operationalizes NDD discourse—the North Carolina Educational State Forest system (NCESF). While NDD and the NCESF are different, they have similar assumptions and practices.

In this paper, I critically examine and assess NDD and forest conservation pedagogy, both of which are predicated on cultural conventions that are part of larger human-nature alienation issues. To explore the core material-symbolic roots of such human-nature problems, critical cultural environmental communication scholars investigate the discourses and assumptions that can enable less than ideal human-nature relations (e.g., see Conley & Mullen, 2008; DeLuca & Slawter-Volkening, 2009; Peterson, Peterson, Peterson, Allison, & Gore, 2006; Rogers, 2007). To critique how this particular child-nature alienation discourse materially and symbolically constructs human-nature relationships and to what effect, I use critical/cultural approaches to ecocultural communication.

I begin by exploring NDD. After overviewing the NCESF and how it compares with NDD, I explain how Louv and forest educators both evoke a fall-recovery narrative and rely on science and naming. Based on my research, without deeper cultural analysis and in the absence of multiple ways of communicating with(in) nature, NDD can be a problematic environmental discourse that contributes to the problem. Essentially, NDD describes the problem's symptoms without examining the underlying pathology. While Louv and educators have noble intentions, their cultural assumptions can obscure core issues and inadvertently promote messages of weak sustainability. Instead, I call on adults to rethink human-nature disconnectedness by returning to the psyche, digging deeper to the problem's roots, and using nontraditional communication practices, such as emotional expression and non-naming.

Nature-deficit Disorder

NDD is part of a conversation about child-nature relationships and disconnection. Scholars have long investigated the complex association between children and nature, and the literature is interdisciplinary and vast (Carson, 1965; Chawla, 2002; Hart, 1979, 1997; Kahn & Kellert, 2002; Katz, 2004). Experiences in nature are thought to profoundly influence a child's physiological, emotional, and social development (Carson, 1965; Cobb, 1977). Research illustrates how recent generations have less unrestrained experience in outdoor surroundings and spend more time indoors or in controlled outdoor settings (Hofferth & Sandberg, 2001; Malone, 2007). Much research points to positive effects of nature exposure, and this research is detailed on the Children and Nature Network (2011) that Louv cofounded.

NDD is a theory that adults use to communicate about larger alienation issues (Bruyère, Teel, & Newman, 2009; Kimbell et al., 2009; McKee, 2005). Louv clearly notes that NDD is a metaphor and not a medical diagnosis. In an interview, when asked about the origins of the NDD term, Louv answers, "It was the title of one chapter in the book … They [the publisher] insisted on having that phrase on the cover. I fought them on that … They were right" (Marcotty, 2011, para. 14). NDD stems from and is contextualized by ADD/ADHD, which is a means by which Louv discusses the issue. Louv argues that nature therapy—"nature's Ritalin"—may reduce ADD/ADHD symptoms. Whether or not the book became popular because of the NDD term, how it frames the issue, or its practical solutions, it remains a bestseller that people and organizations have put to use.

Working from the assumption that something has gone terribly wrong since his generation's middle-class post-WWII 1950s childhood, Louv contends that children have detached from nature and pay a heavy price. Decreased contact is attributed to parental protectionism, media-induced anxiety, fear of litigation, and "well-meaning (and usually necessary) environmental regulations" (2005, p. 31). The effects include dulled senses, behavioral difficulties, obesity, stress, declining academic performance, and decreased emotional and physical well-being.

Louv documents carefully collected empirical research on the benefits of children spending time in nature (Children & Nature Network, 2011; Louv, 2005). Louv argues children need more physical contact with nature, and he praises many hands-on environmental education (EE) initiatives. Governmental park and forest programs get students outside, and, in light of development and urbanization, Louv positions these designated nature sites as ideal places. Eager to increase visitor numbers and be a part of the solution, park and forest educators agree.

Merits

There are important merits to Louv's hypothesis. Louv's beliefs represent how many people think about human-nature relations, and Louv and his supporters have honorable intentions and are truly concerned about children. Louv compassionately describes a real issue in an accessible way and with valid empirical documentation— that children *are* alienated from their surroundings, with frightening implications.

Louv successfully draws attention to issues scholars have highlighted, such as fear and despair (Macy, 1995), stunted childhood development (Kahn & Kellert, 2002), and technological implications (Glendinning, 1995).

Louv caringly points to widely supported claims that contact with nature is therapeutic, restorative, relaxing, and emotionally and physically beneficial, and he encourages adults to connect alongside children. Louv implicates dysfunctional organizations and systems as part of the problem. Obesity, ADHD, the criminalization of free play, litigation, and fear are important issues, and Louv draws from well-substantiated research to point to the benefits of green schools, cities, and communities. Believing in the power of people to inspire change, the book offers practical solutions that adults can immediately use. Reader-friendly and optimistic, the book is an important call to fix damaged human-nature relationships, and its popularity demonstrates that many people want change.

Limitations and critiques

My intention is not to diminish the issues raised in Louv's book. Instead, I argue that NDD and how EE programs operationalize it can be predicated on assumptions that are arguably part of larger alienation issues. These assumptions need critical consideration, and my goal is to complicate Louv's argument and forest conservation pedagogy and not dismiss them entirely. Louv makes a simple and valid point with which I agree—human-nature relationships are alienated and unhealthy, and educational programs do get children physically into designated nature sites. At the same time, the conditions, discourses, and practices that guide human-nature reconciliation and what happens when children are "in nature" may not fully address the problem. Whereas NDD supporters promote taking children outside, I argue that adults need to simultaneously return to the psyche and the complex cultural roots of human-nature estrangement.

Essentially, there are implications to how Louv and educators position and simplify the problem, notably in what is missing. In this regard, McKerrow (1989) notes, "*Absence* is as important as *presence* in understanding and evaluating symbolic action" (p. 107, emphasis in original). I attempt to illustrate how Louv forms a simple argument, where much goes unspoken about the complex cultural issues that contribute to the problem in the first place. While certainly meaning no harm, scholars and practitioners can inadvertently do a disservice by oversimplifying and omitting deeply embedded cultural matters. By examining Louv's and rangers' discourses and practices alongside what is missing from them, I identify how meaningful environmental change can be hindered.

Forest Conservation Education

Environmental education (EE) initiatives vary greatly, with radically diverse approaches and assumptions about human-nature relationships.[2] A plethora of EE and nature-related programs abound—from mainstream K-12 science-based EE curricula to less traditional human-nature reconciliation initiatives. EE programs

position environmental problems differently, use diverse tools, and proffer various solutions. Important to note is that the forest conservation EE program I examine is one example and not representative of all.

The North Carolina's Division of Forest Resources manages the NCESF sites with the goal to get visitors into forests and learn about environmental issues, forest management, and ecology. The forests feature exhibits, rest areas, and trails. In unique "talking trails," visitors press a button on a post near trees and rocks and hear them "speak" over a loudspeaker. Educators bring children to the forests on fieldtrips where rangers and educators offer structured science-based conservation education sessions. The classes incorporate hands-on lessons from curricula such as Project Learning Tree and Project WILD.

The NCESF-NDD Intersection

NDD is a child-nature separation theory with practical solutions, and the NCESF aligns with and operationalizes NDD. To reiterate, NDD and the NCESF are not one and the same. NDD is an environmental discourse that addresses child-nature alienation, reaching wide audiences and promoting activism and reform. In contrast, the NCESF is a specific state conservation education program focusing on forests and does not seek reform. Louv tackles topics that the NCESF does not, such as sustainability, urbanization, green design, and educational reform. As a conservation-based governmental organization, the NCESF promotes wise human consumption of natural resources and focuses on educational field trips. NDD's message is directed at parents, educators, and activists; the NCESF's message is aimed mostly at visitors and students. The NCESF manages public forests and educates local schoolchildren, while NDD seeks to change the national dialog on child-nature alienation and offers adults specific tools.

NDD and forest conservation education are similar in several ways. Louv advocates for EE and experiential learning programs such as forest conservation pedagogy, and forest educators frequently appropriated NDD-inspired language. One forest ranger told me in an interview, "There's a lot of push right now—you know, the 'last kid left in the woods'—about getting more kids out into the environment and exposed." From the moment I began this project, rangers encouraged me to read Louv's book and advocated his message. Both Louv and rangers draw from similar cultural assumptions, such as problematizing a shortage of time spent in nature and prescribing exposure as a cure. The NCESF is one of many treatment facilities, of sorts, where Louv encourages children to go. Essentially, NDD has become a means by which people communicate beliefs about human-nature relations, culture, and pedagogy, and the NCESF is a site that supports and appropriates that message.

Child-nature Alienation Discourses in NDD and Forest Conservation Education

This paper stems from a project where I investigate communication about human-nature disconnectedness and the language Louv and rangers use. I spent time both on

and off the NCESF sites where I interviewed forestry officials and researched the forests, lessons, talking trails, educational texts, and forest service discourse. Specifically, I incorporated participant observation methods (Emerson, Fretz, & Shaw, 1995; Lindlof & Taylor, 2002; Mason, 2002), a grounded-theory approach (Strauss, 1987), and critical theorizing.[3] I used these methods to investigate how various communicators (rangers, educators, students, parents, chaperones, the forest service, and Louv) articulate child-nature issues.

My research identifies three ways Louv and educators similarly present human-nature relationships and their underlying cultural assumptions. In both, nature is constructed: (a) as something from which children recently have fallen and need to return; (b) through a natural science lens; and (c) through naming practices. Below, I first document these discourses and then critically point to potential implications when using them as sole framings.

A fall-recovery narrative: "when I was young"

Scholars point to how, in Western contexts, nature is understood within a narrative of a decline from a pristine nature, followed by a need to return (Bullis, 1996; Cronon, 1996b; Merchant, 1996).[4] Cronon (1996b) argues that "wilderness" is a reiteration of fall-recovery, where US Americans desire to return to a (largely human-constructed) wild nature. Cronon (1996b), Bullis (1996), Plumwood (1997) and others critique environmental movements that rely on a return to the wild argument. A similar fall-recovery assumption permeates NDD and NCESF communication practices.

Louv distinctly evokes a fall-recovery narrative. Louv argues "the broken bond" (p. 3) is a particularly recent phenomenon, as seen when Louv positions the issue as, "The new relationship between children and nature" (p. 4). Cultural, institutional, and personal factors have caused the split, where technology, television, air conditioning, decreased natural habitats, and test-based education reform keep children inside.

In Louv's book and in the forests, the fall-from-nature narrative appears in adults' stories about how modern childhood has negatively changed. I labeled this trope "when I was young" because adults frequently begin with this statement when they sentimentally depict their ideal childhood experiences. Evoking "when I was young," Louv notes, "Americans around my age, baby boomers or older, enjoyed a kind of free, natural play that seems … like a quaint artifact" (p. 1). He argues that baby boomers "may constitute the last generation of Americans to share an intimate, familial attachment to the land and water" (p. 19).

In the forests, adults spoke of how "kids don't go outside anymore" and how "it has changed since we were young." In an interview, one ranger told of how students visiting the forest "freaked out" at a puddle and how this behavior differs from the ranger's childhood experience: "When I was a kid, I'd go right through the middle of it [the puddle]. It just blows my mind that these kids don't want to just go stomp in a puddle." During a field trip, one chaperone noted how childhood has changed, and she reflected on her youth: "We'd climb trees, whatever, no problem.

You'd get on a bike and go everywhere." She continued, "They really miss out when everything is so organized. When they're home its computer, TV, Game Boy."

To address the fall from nature, Louv and educators promote a child-nature reunion. Louv specifically draws from Wilson's (1984) biophilia hypothesis and ecopsychology's reconnection practices. Louv calls for restructured homes, communities, and play spaces to increase access, and he prescribes nature walks, hiking, camping, cloud spotting, nature games, gardening, wildlife photography, adopting trees, digging ponds, bird watching, fishing, rock collecting and polishing, and learning names. Louv endorses scouting organizations which "deserve praise for maintaining any link to nature" (p. 154), and he supports trips to gardens, zoos, and museums. Forests are promoted as protected "nature" places, where children travel to "come into nature," as one ranger phrased it. Louv promotes eco-friendly cities and green urbanism, and one possible solution is reviving abandoned rural towns, such as those on the Great Plains (Cooper, 2007; Louv, 2005). Yet, Louv notes how rural youth are still alienated and connection practices are still needed.

Implications of fall-recovery. Fall-recovery narratives can be problematic in how they reify the human-nature split, obscure environmental justice, influence irresponsible behavior, and normalize contemporary conditions and relationships (Bullis, 1996; Cronon, 1996b; Kahn, 2002; Merchant, 1996). First, the assumption that past generations were closer to nature can deemphasize a long history of environmental degradation and disconnectedness (Kahn, 2002). Using the term *environmental generational amnesia*, Kahn notes how people normalize and idealize their own childhoods, where each generation then "takes that degraded condition … as the normal experience" (p. 113). The desire to return to a safer, ideal, and "normal" state can obscure prior degradation and create a less than ideal starting point. Louv and adults position their youth as ideal and safer, where nature was more accessible and wild with more freedom and less fear. Yet, the eras that adults promote were marked by their own forms of degradation and fear. For example, in the 1950s, the use of pesticides (such as DDT) and pollution were rampant, which helped spark Carson's (1962) *Silent Spring* and modern environmentalism. While there was less media-induced "stranger danger" in the 1940s and 1950s, Segal (2003) notes the profound anxiety created through nuclear proliferation and threat, a fear that permeated the personal and cultural psyche.

Fall-recovery, then, is a subjective cultural creation in how it positions the *kind* of nature and childhood to which humans should return. Louv's solution to "why Johnnie and Jeannie don't play outside anymore" (p. 113) is through a normal "traditional" childhood:

> Revive old traditions. Collect lightning bugs at dusk, release them at dawn. Make a leaf collection, keep a terrarium or aquarium. Go crawdadding—tie a piece of liver or bacon to a string, drop it into a creek or pond, wait until a crawdad tugs. (p. 360)

Louv idealizes his white middle-to-upper-class 1950s youth, longing for exploration, tree houses, forts, fishing, collecting, cataloging, and journalizing—all ways of

relating to nature that are guided by cultural assumptions. Louv idealizes Muir, Leopold, Roosevelt, Darwin, Thoreau, D. H. Lawrence, Davy Crockett, and Woody Guthrie. While these men are admired environmental advocates, they offer predominately White, male, and Western perspectives. The desire, then, appears to be to return to a "normal," particularly White, middle class, male, heterosexual cultural past that obscures race, class, and gender politics. Louv and rangers forefront diversity, such as Louv's reference to Luther Standing Bear, Rachel Carson, and Lao-Tzu and the forest service's "Minority Landowner Program." Yet, this inclusion often occurs in ways where diverse groups are depicted as conforming to (or needing to conform to) a conservation ethic that espouses a specific way of being in nature.

One may argue that Louv's intention is not to take on race, class, and gender politics; yet, alongside human-nature alienation and environmental degradation, these issues are a key part of the problem, and excluding them can oversimplify and misdiagnose. Human-nature estrangement is exceptionally complex and involves underlying issues of power that result in environmental destruction, classism, racism, sexism, and homophobia. As a result, researchers have problematized environmentalist messages that ignore these issues and largely speak for and to affluent white audiences (Bullard, 2001; Milstein, Anguiano, Sandoval, Chen, & Dickinson, 2011; Morello-Frosch, Pastor, & Sadd, 2002; Pulido, 2000).

Additionally, Louv and educators prescribe returning to nature mainly through physical activities, such as hiking, camping, fishing, hunting, and bird watching. As international research demonstrates, children engage in similar activities worldwide, and these practices are not specific to white middle-to-upper-class Western men. Yet, these activities take place under specific cultural pretenses and with diverse effects. For example, while children in Western and non-Western cultures both hunt, the cultural conventions that underpin hunting practices significantly differ, such as how animals and nature are conceptualized and treated, or whether hunting is a form of power over nature versus a form of communion. These activities do not automatically create connection, affect, or emotional attachment; they may pose challenges and obscure environmental issues, not by what humans do during these practices, but the mindset and assumptions that undergird them.

Moreover, spending time outdoors in the way Louv and educators propose typically requires transportation, time, money, consumption, and a particular lifestyle and mindset. For example, while Louv acknowledges recent problems in the Boy Scouts, he supports scouting organizations. Yet, participation in the Boy Scouts typically requires money, time, and transportation, not to mention the pretenses of masculinity and heterosexuality. Similarly, birdbaths, ponds, and gardens often require resources, property, and space. Louv briefly acknowledges the pressures parents endure but omits the burdens of low-income households. For single, financially constrained, and geographically (and often racially) segregated families, taking children outside or traveling to designated nature areas can be difficult. Moreover, these activities frequently require an element of physical and social access; even if one does have the resources, people of color, women, and youth may not have the same kind of safety in their access (Evans, 2002). By focusing on certain activities

and assumptions, adults ignore deep ecologists, ecofeminists, environmental justice activists, American Indian/Native American advocacy groups, and others who work tirelessly to expose environmental degradation, racism, sexism, and classism.

The lens of science: "hello, I'm Quercus falcata"

Louv and rangers promote science to reconnect youth with nature by getting them into the thick of nature exploration. Natural science offers applied physical connection through knowledge and experience. In the United States, nature is deeply situated within a Western science episteme (Opie & Elliot, 1996; Pepper, 1984), and in many environmental debates, science often is granted the role of the ultimate, rational, and objective authority.[5] At the same time, science is conceptualized within human cultural contexts (Haraway, 1989; Pratt, 1992; Terry, 2000). In effect, physical science, the scientific method, natural history and, more importantly, the cultural assumptions that produce and contextualize them, deeply influence human-nature discussions.

Scientific approaches to environmental pedagogy have a significant positive value; science can be a beneficial reconnection tool by physically positioning the student with(in) a designated nature setting, while teaching information. In this way, experience and knowledge can help support connection, where science places youth materially with(in) nature, while contributing to intellectual development, stewardship, and a conservation ethic. Moreover, applied science tools can enhance connection through sensory and corporeal practices.

Louv points to natural history as a beneficial reconnection tool. Louv argues that the child-nature rift partly stems from a decline in K-12 and college natural history education: "We see the death of natural history as the more hands-on disciplines, such as zoology, give way to more theoretical and remunerative microbiology and genetic engineering" (2005, p. 3). Positioned as "an intimate science predicated on the time-consuming collection and naming of life forms" (p. 42), practices include acquiring, studying, and naming specimens; investigating measurements and attributes; and deducing inferences.

A science framing is evident in the forests, beginning with forest conservationism, which conceptualizes forests through scientific principles. According to a conventional view of forestry, trees are understood within overarching concepts of wise use (sustainably harvesting natural resources), profitable production, efficiency, and accounting and economic principles (Bergoffen, 1976; Hays, 1959; Pinchot, 1947/ 1987). Forestry officials still largely use scientific and management techniques to produce large amounts of wood and mostly believe that scientific methods of forest management will help humans use nature wisely.

Science is a significant part of the NCESF. For their field trips, educators often choose a science objective and corresponding pre-arranged lesson, such as "Tree Rings," "How Paper Comes from Trees," and "Oh Deer!" Many educators incorporate science-based lessons in order to meet the demanding requirements of public K-12 curricula and assessment. Teachers are not required to use science in

their fieldtrips; however, they typically must justify the fieldtrip as educational, and under the increasing structuration of post-*No Child Left Behind* assessment testing and budget cutbacks, science-based fieldtrips often are considered more educationally valuable.

Educators frame nature through the use of scientific taxonomies, categorization, and cataloging, such as when plant life is presented through scientific and Latin names. For example, talking-tree recordings often say things such as, "Hello, I'm southern red oak, or as the tree experts call me *Quercus falcata*." In one forest's geology trail—"the home of the talking rocks"—recordings identify rocks as metamorphic, igneous, and sedimentary. Rocks are positioned through geological history, such as the limestone recording: "I was formed in a warm tropical sea 25 million years ago" and the granite recording: "I am a piece of granite, just one part of a large body of rock called a batholith."

A science-centered approach is also found in lessons. In the "Tree Rings" lesson, students learn to determine a tree's age by drilling an increment borer into the tree, removing a live core sample, and counting the sample's rings. Rangers use tree cross sections called "tree cookies" which are treated with polyurethane to make the rings more visible and easier to count (See Figure 1). Tree cookies provide a compartmentalized specimen that is measured through physical specifications, as per scientific practices.

Figure 1. (Color online) "Tree cookies" used in lessons to count a tree's age. Picture taken by Elizabeth Dickinson.

Many lessons also centered on natural science naming and cataloging, where educators encourage students to identify and classify. For example, as one educator said in a "Tree Identification" lesson, "Today we are going to learn how to ID a tree. When you are walking around the forest, don't you want to know what kind of tree you are looking at?" During the lesson, students learned to differentiate between trees by collecting leaves. The instructor then grouped the leaves, and children taped samples to a "My Leaf Collection" notebook and wrote the names next to the leaves (See Figure 2).

Potential limitations of science framings. There are implications to promoting science, notably in the *absence* of other framings. In many ways, science does achieve physical connection in nature education. In "Tree Rings" lessons, students touch, smell, and analyze core samples and tree cookies. In "Aquatic Insects" classes, children use nets to catch, identify, and release water life in a pond. In "How Paper Comes from Trees" lessons, students excitedly dip their hands in paper pulp and touch and smell the paper

Figure 2. (Color online) Collecting, identifying, and cataloging leaves in "Tree Identification" classes. Picture taken by Elizabeth Dickinson.

they make. While these experiences can be sensory, as a predominant framing, they can create distance by emphasizing a cognitive and analytical approach, while minimalizing emotional expression, connectedness, and co-presence. In this regard, affect does not equal knowledge and vice versa.[6] While Louv and rangers do occasionally forefront spiritual and emotional connections with nature, analytical and scientific framings are the primary focus.

Using science as a predominant method to teach EE has received criticism, notably in the use of a mechanistic-Cartesian paradigm that underlies modern science (Palmer, 1998).[7] Due to traditional positivistic assumptions foundational to natural science, the ability for students to critically engage in ways that address environmental issues may be minimalized. Even the use of ecology, which is frequently evoked as a preferred holistic approach, exists within what Korfiatis (2005) calls "an uneasy relationship" with EE, often "[complying] more with a post-positivistic account of education" (p. 235).

In effect, students' corporeal experiences may occur more within the context of objectification and consumption. While students touch and smell core samples, these actions take place within the primary setting of a tree being drilled into, examined, and catalogued through its parts. Rangers tell children that cutting into trees is not harmful and trees produce sap to seal the holes, but holes do make trees more vulnerable to insects and disease. Similarly, when handling tree cookies, students do not typically touch the trees or wood; instead, they handle polyurethane coated sections. When making paper, touching tree pulp takes place with processed wood materials and within the context of commercial paper making and wise use and conservation. When students pick, identify, and catalog leaves, the leaf is turned into an ordered entity, to be understood apart from trees as a whole. In effect, core samples, tree cookies, and paper pulp are *pieces* of a tree, scientific objects that deemphasize a tree's wholeness or interconnectedness with an ecosystem and other entities, including humans. Ultimately, instead of holistically understanding trees, children are sent the primary message that nature is to be understood through its contained and catalogued parts and grown and used for human consumption.

The importance of naming: "what we can't name can hurt us"

In addition to science, naming is promoted as a tool to learn about nature and make it more familiar. I did not conflate naming with the science framing above because, while science involves naming entities, educators also present nature through names that work outside of science. Moreover, educators engaged in meta-communication naming practices that transcend scientific naming.

Scholars investigate how the communication practice of naming influences human-nature relationships. Humans can name entities in neutral, euphemistic, and pejorative ways, where names reflect, mediate, and determine environmental beliefs (Schultz, 2001). Chawla (2001) describes the relationship between language, ideology, and human perception of nature at objective (natural environment) and cognitive (human perception) levels of reality. Naming can promote objectification

and distancing (Abram, 1997; Stibbe, 2001), and Carbaugh (1996) argues that "well-worn linguistic ruts" and naming practices inherent in English can trap humans within nature-culture dualisms. Milstein (2011) points out that naming can also fulfill a restorative function.

Louv positions naming as an important reconnection tool. Not knowing something's name can be detrimental, such as when Louv contends, "What we can't name can hurt us" (p. 143), and, citing biologist Elaine Brooks, "humans seldom value what they cannot name" (p. 141). Louv points to the benefits of learning the names of trees, flora and fauna, insects, and animals, and how names give an entity value. Naming permeates many activities that Louv promotes.

In the forests, determining something's name was a primary goal during many student-educator interactions. Students and adults often expressed a need to want to name and learn names. When students encountered an unfamiliar entity, they frequently asked "What is that?" or "What is that called?" Educators also stressed the need to teach students that wanting to name is important.

Central to visitors' experiences is naming through common names, nicknames, anthropocentric labels, and regional and colloquial terms, and comparisons are made between naming trees and people. One talking-tree recording notes, "Hello, I'm American beech—some people call me just plain beech, Carolina beech, gray beech, red beech, ridge beech, or white beech." In another recording, naming is anthropocentrically positioned: "We trees have first and last names … my last name is oak, which places me in a specific family, called a genus. My first name makes me different from other members of my family."

Rangers and recordings additionally engage in meta-communication about naming, who can name, and why. Rangers and the forest service have the ability to name, and this naming is often privileged. For example, a locust talking-tree recording states, "Indians used my strong hardwood to make their bows. The English colonists first named me locust in 1607." There are several interpretations to this passage. One reading is that rangers are emphasizing *locust* as the first English name colonists gave the tree. Another interpretation is that the first naming is attributed to the English and not Native communities. Regardless, Native Americans likely had their own name and relationship with the tree, but this name is not mentioned. In effect, educators and rangers frequently promote naming as a primary source of knowledge that contributes to understanding and reconnecting.

Critical implications of naming. Louv and rangers largely assume that naming creates intimacy and affect through knowledge. In the forests, the tendency is to promptly learn names and then move on. Yet, in the absence of non-naming and emotional connection, naming can privilege an objectified ordering of nature, where names can help keep an intellectual distance from an entity's material form and interconnectedness with other entities. In this way, Stibbe (2001) argues that naming can illustrate and reify difference and justify oppression. Ordering nature through naming can allow for nature to be extracted from a holistic ecological view to one that is fragmented (Wilson, 1992). Naming practices do get students physically and intellectually close to

nature. Yet, naming emphasizes rationality and minimizes co-presence and emotional connectedness.

Rethinking NDD: A Rediagnosis and Nontraditional Practices

Above, I identified similar discourses that Louv and rangers use to frame child-nature disconnectedness. I then critiqued these framings by pointing to possible consequences, notably when using these framings in the absence of others. Here, I make the call to rethink NDD, and I offer a possible rediagnosis and alternative approaches that use communication tools to reconceptualize the problem and teach environmental issues to youth. Throughout, I contrast the NCESF and NDD approaches with alternatives.

My primary goal is to rethink NDD. Louv has successfully launched an important conversation and critique of human-nature disconnectedness, and my intention is to extend this discussion. Based on my research, I argue that Louv, rangers, and others do not fully explore important cultural factors that underlie fall-recovery narratives, science, and naming and how they influence human-nature relationships. Adding these cultural dimensions to the conversation is important as they are a large part of the problem.

The discourses and practices I documented form an argument based on *weak sustainability*, a term Huckle and Sterling (1996) use to describe environmental movements that preserve the social and economic relations that cause and perpetuate environmental problems. For example, Louv's "100 Actions We Can Take" section mostly focuses on fall-recovery, science, and naming-based activities to get children outside. Unmentioned are the cultural, political, and economic issues that promote dysfunctional human-nature relations and environmental degradation in the first place.

Weak sustainability arguments then enable people to attribute the problem to symptoms and not underlying pathologies. Child-nature alienation is positioned as being *caused by* a lack of exposure to nature—a nature that is framed as separate from humans. Lacking contact with nature is then caused by technology, over protectionism, development, urbanization, educational reform, and fear. These issues certainly are important to address. Yet, these issues are not the cause; instead, they are indicative of larger issues and beg the question—what contributes to these symptoms? Why do some humans choose this way of relating to nature, and to what effect? As a result, Louv and educators promote a distracting sidestep, convincing ourselves we are addressing the problem when we are actually treating the symptoms.

A rediagnosis

Instead of urbanization, fear, development, and limited exposure, I argue that the core issue lies in how psychological, interpersonal, and cultural fracturing promote disconnection in the first place, leading to the notion that nature is outside of humans who suffer from decreased contact with it. Despite Louv and educators' forefronted assertions that humans are a part of nature, the primary nature they evoke is an anthropocentric human construction, driven by and entrenched in a

human-nature binary, a fall-recovery myth, and distancing through science and naming.

A rediagnosis begins by shifting the issue from a lack of experience in nature among youth to problematic adult and cultural psyches and practices, as per the complete tenets of ecopsychology. Instead of sending children outdoors and into nature, adults need to first turn inside into an examination of the psyche and dysfunctional cultural practices. The problem is not caused by technology, urbanization, fear, and overprotective homeowner's associations or by decreased contact with nature but by over-rationalization, objectification, suppressed emotion, a decreased sense of place, and anthropocentrism. Retheorizing shifts the problem from a modern fall from nature to a long, gradual history of psychological and cultural estrangement with nature and place—a notion that needs to be added to nature education discourses. Obesity, ADD/ADHD, depression, and behavioral difficulties are still problems, but they are not caused by a nature deficit.

Alterative practices

I do not advocate abandoning natural science, learning names, or spending time with (in) nature. I personally revel in walking in forests, collecting leaves, and learning the names of trees. My intention is not to demonize these practices; diverse approaches surely are important, and there are multiple strengths of science and naming. Instead, I argue that, when positioned centrally and in the absence of other approaches, a fall-return narrative, science, and naming can be incomplete. *Alongside* these approaches, incorporating techniques that involve communicating connectedness are essential, yet they are largely absent in contemporary environmental discourses such as NDD. Below, I explore the benefits of including approaches that are more reflexive, less anthropocentric, and reframe fall-return, science, and naming. Most important, these methods are enacted via communication practices that can reposition human-nature relations.

Inward expansion. First, adults need to recognize that the fall-from-nature narrative is inaccurate and incomplete. Fall-recovery and the wilderness myth can create a paradox where "wilderness embodies a dualistic vision in which the human is entirely outside the natural. If we allow ourselves to believe that nature, to be true, must also be wild, then our very presence in nature represents its fall" (Cronon, 1996b, p. 81). Louv notes that when he uses the word *nature*, he means "natural wildness: biodiversity, abundance—related loose parts in a backyard or a rugged mountain ridge" (p. 9). He also notes that "humans are also part of that wildness" (p. 9) and that nature can be found in unassuming places. Louv then evokes ecopsychology's call to acknowledge human-nature disassociation and place humans in nature to heal. However, the most important ecopsychology canon is absent here, specifically that psychological and cultural practices *guide* dysfunction and need to be addressed *alongside* reconnection. Lertzman (2004) notes the persistence of this return ideology, specifically the tendency to omit critical psychological and cultural analyses: "Ecopsychology as philosophy and practice has been relegated to workshop culture

and often has a 'getting-back-to-nature' ethos" (p. 396). Essentially, the fall-return stance skips digging into the underlying roots of cultural dysfunction and instead heads straight for the woods.

An alternative approach, then, calls on adults to critically question the fall-recovery assumption and how they use it to communicate their own experiences and beliefs. This begins with a true recognition of—and not just a nod to—the notion that nature is everywhere and humans are nature, and not a part of or in nature. Nature is constant and does not exist in particular outdoor places. In an outward movement, educators and Louv encourage adults to take children outside and "to nature" for the cure, advocating to "open the fourth frontier" by redesigning and rebuilding green spaces and increasing EE, science, naming, and nature exploration. In contrast, alternative practices call on humans to make an entirely different kind of move—first go inside (psychologically, culturally, and relationally) and ask the difficult questions.

Inward expansion calls on adults to address the cultural, economic, and political systems that contribute to alienation, notably concerning issues that are missing from Louv's conversation—poverty, racial segregation, cultural alienation, environmental racism, and rampant overconsumption. Louv and educators call for children to be outside and active in nature places; I call on adults to first be reflective in our inner unknown spaces, perceiving the psyche and cultural practices as frontiers. When it is time to seek help with(in) nature, it is with a reflexive spirit of co-presence, where one is *with* and *of* nature, not *in* it.

Emotional expression and connectedness. Second, a rediagnosis calls on adults to critically question the primary use of science to teach youth about nature, notably the ways in which science can over intellectualize and diminish emotional expression. Once again, a return to ecopsychology is useful. Macy (1995) argues that over intellectualizing human-nature relationships can stem from "a dichotomy between reason and emotion" (p. 248). Overrelying on logic can position feelings associated with environmental despair as "unreasonable," as sheer "madness" (Shepard, 1982). Macy and Brown (1998) note that a fear of appearing weak and emotional is a psychological source of repression, where emotion has been divorced from reason. This can create the inability to turn inward and feel the same fear, anger, and sorrow toward environmental degradation (such as drilling into or cutting down a tree) that humans feel at the death of a loved one or pet. Macy (1995) also points to the fear of appearing morbid or pessimistic, where in the context of a US American's "can do" optimism, "feelings of anguish and despair for our world can appear to be a failure to maintain stamina or even competence" (p. 245). Alongside science framings, then, incorporating emotion into nature education is essential.

Non-naming practices. Last, in contrast to naming is the nontraditional technique of letting go of names. Non-naming may seem counter to learning about nature; yet, it is a useful tool to use together with naming. Brown (1986) argues how, when humans primarily emphasize naming in their interactions with nature, there is a "tendency to learn the name and be done with it. Most people collect names instead of information

and experience" (p. 24). As a substitute, non-naming includes focusing on concepts, feelings, and sensations, and one need not be in a designated nature setting to practice non-naming techniques. Experiencing in this way is possible while also learning scientific names. For example, in the forests, when students ask what an entity is named—such as a millipede—educators often immediately reply with the name. Brown instead encourages adults to respond with: "First, sit down and hold it in your hand." After the child experiences it, then ask, "How does it feel?" "How does it talk?" "How does it see?" "How does it smell?" and "What is it like?" Educators can then ask "What would you name it?" or even, "Do you want to name it?" Educators can then present the scientific name as one way to understand and connect.

Reconceptualizing the problem and offering alternative techniques helps tackle human-nature disconnectedness head on and allows for a more thorough examination. In contrast to Louv and educators' views, Cronon (1996a) argues, "To protect the nature that is all around us, we must think long and hard about the nature we carry inside our heads" (p. 22). Merchant (1996) poses the question, "Can we actually step outside the story into which we have been cast as characters and enter into a story with a different plot" (p. 157)? To address this question, a rediagnosis and alternative practices can perhaps implore the recognition of underlying cultural beliefs that problematize NDD and nature education.

Acknowledgements

Notes

[1]   Following other scholars (e.g., Haraway, 2008; Milstein, 2011; Milstein et al., 2011), instead of using human-nature and the environment/environmental, I use the terms human-nature and ecoculture, a move that helps avoid separating "nature" and "the environment" from humans.
[2]   For a comprehensive overview of environmental education research and diverse approaches, see Rickinson (2001).
[3]   In writing fieldnotes, I followed the methods of Bernard (2006), Emerson, Fretz, and Shaw (1995), and Lindlof and Taylor (2002). Procedurally, when using grounded theory, I employed open, analytical, and focused coding to develop and analyze the codes and categories from the research. Going back and forth between theory and research, I organized the codes into themes.
[4]   Merchant (1996) argues that a grand fall-recovery ideology stems from Christian biblical narratives of a fall from the Garden of Eden, caused by Eve. Bullis (1996) notes how many modern Western environmental discourses "depict a Judeo-Christian fall from grace and a vision of a single way to return to the Garden" (p. 136) and are rooted in Western patriarchy.
[5]   Essentially, enlightenment rationalism has positioned nature as a machine that is inferior to human intellect; the scientific method provided an objective way to analyze and control

nature; and natural history offered methods to discover, describe, and catalog—and thus master over—nature (Opie & Elliot, 1996).

[6]   Illustrating this point, in an examination of US Americans' knowledge on climate change, Leiserowitz, Smith, and Marlon (2010) show that those with the most knowledge of climate change are most likely to deny climate change.

[7]   Briefly, the critique is that modern science overly relies on a scientific worldview of nature as a machine that humans reign over; utilizes reductionist methodologies; reinforces human–nature dualism; and plays a central role in environmental degradation (Palmer, 1998).

References

Abram, D. (1997). *The spell of the sensuous: Perception and language in a more-than-human world.* New York: Vintage Books.

Bergoffen, W. (1976). *100 years of federal forestry.* Washington, DC: USDA Forest Service.

Bernard, H. R. (2006). *Research methods in anthropology: Qualitative and quantitative approaches.* Lanham, MD: Rowman & Littlefield.

Brown, T. (1986). *Tom Brown's field guide to nature observation and tracking.* New York: Berkeley Books.

Bruyère, B., Teel, T., & Newman, P. (2009). Response to "more kids in the woods: Reconnecting Americans with nature." *Journal of Forestry, 107*(7), 378–379.

Bullard, R. D. (2001). Environmental justice in the 21st century: Race still matters. *Phylon, 49*(3, 4), 151–171. doi:10.2307/3132626

Bullis, C. (1996). Retalking environmental discourses from a feminist perspective: The radical potential of ecofeminism. In J. G. Cantrill & C. L. Oravec (Eds.), *The symbolic earth: Discourse and our creation of the environment* (pp. 123–150). Lexington: University of Kentucky Press.

Carbaugh, D. (1996). Naturalizing communication and culture. In J. G. Cantrill & C. L. Oravec (Eds.), *The symbolic earth: Discourse and our creation of the environment* (pp. 38–58). Lexington: The University of Kentucky Press.

Carson, R. (1962). *Silent spring.* New York: Fawcett.

Carson, R. (1965). *The sense of wonder.* New York: Harper Row.

Chawla, S. (2001). Linguistic and philosophical roots of our environmental crisis. In A. Fill & P. Muhlhausler (Eds.), *The ecolinguistics reader: Language, ecology, and environment* (pp. 115–123). New York: Continuum International.

Chawla, L. (2002). Cities for human development. In L. Chawla (Ed.), *Growing up in an urbanizing world* (pp. 15–34). London: Earthscan.

Children & Nature Network. (2011). *Research & resources: Studies, reports, & publications.* Retrieved from http://www.childrenandnature.org/research/.

Cobb, E. (1977). *The ecology of imagination in childhood.* New York: Columbia University Press.

Conley, D. S., & Mullen, L. J. (2008). Righting the commons in Red Rock Canyon. *Communication & Critical/Cultural Studies, 5*(2), 180–199. doi:10.1080/14791420801989694

Cooper, A. (2007, February). Nature-deficit disorder? *The Sun Magazine, 374*, pp. 4–11.

Cronon, W. (1996a). Forward to the paperback edition. In W. Cronon (Ed.), *Uncommon ground: Rethinking the human place in nature* (pp. 19–22). New York: W. W. Norton.

Cronon, W. (1996b). The trouble with wilderness; or, getting back to the wrong nature. In W. Cronon (Ed.), *Uncommon ground: Rethinking the human place in nature* (pp. 76–90). New York: W. W. Norton.

DeLuca, K. M., & Slawter-Volkening, L. (2009). Memories of the tropics in industrial jungles: Constructing nature, contesting nature. *Environmental Communication: A Journal of Nature and Culture, 3*(1), 1–24.

Emerson, R., Fretz, R., & Shaw, L. (1995). *Writing ethnographic field notes.* Chicago, IL: The University of Chicago Press. doi:10.7208/chicago/9780226206851.001.0001

Evans, M. M. (2002). "Nature" and environmental justice. In J. Adamson, M. M. Evans, & R. Stein (Eds.), *The environmental justice reader: Politics, poetics, and pedagogy* (pp. 181–193). Tucson: University of Arizona Press.

Fraser, J., Heimlich, J. E., & Yocco, V. (2010). *American beliefs associated with increasing children's opportunities for experiences in nature* (Report No. 20100226). Edgewater, MD: Institute for Learning Innovation. Retrieved from http://www.childrenandnature.org/downloads/ EC-NES_Final_Report_2010.pdf

Glendinning, C. (1995). Technology, trauma, and the wild. In T. Roszak, M. E. Gomes, & A. D. Kanner (Eds.), *Ecopsychology: Restoring the earth, healing the mind* (pp. 41–67). San Francisco, CA: Sierra Club Books.

Haraway, D. (1989). *Primate visions: Gender, race, and nature in the world of modern science.* New York: Routledge.

Haraway, D. (2008). *When species meet.* Minneapolis: University of Minnesota Press.

Hart, R. (1979). *Children's experience of place.* New York: Noble Offset Printers.

Hart, R. (1997). *Children's participation: The theory and practice of involving young citizens in community development and environmental care.* London: Earthscan.

Hays, S. P. (1959). *Conservation and the gospel of efficiency: The progressive conservation movement, 1890–1920.* Cambridge, MA: Harvard University Press.

Hofferth, S. L., & Sandberg, J. F. (2001). How American children spend their time. *Journal of Marriage and Family, 63*(2), 295–308. doi:10.1111/j.1741-3737.2001.00295.x

Huckle, J., & Sterling, S. (1996). *Education for sustainability.* London: Earthscan.

Kahn, P. H. (2002). Children's affiliations with nature: Structure, development, and the problem of environmental general amnesia. In P. H. Kahn & S. R. Kellert (Eds.), *Children and nature: Psychological, sociocultural, and evolutionary investigations* (pp. 93–116). Cambridge, MA: MIT Press.

Kahn, P. H., & Kellert, S. R. (2002). *Children and nature: Psychological, sociocultural, and evolutionary investigations.* Cambridge, MA: MIT Press.

Katz, C. (2004). *Growing up global: Economic restructuring and children's everyday lives.* Minneapolis: University of Minnesota Press.

Kimbell, A. R., Schuhmann, A., & Brown, H. (2009). More kids in the woods: Reconnecting Americans with nature. *Journal of Forestry 107*(7), 373–377.

Korfiatis, K. J. (2005). Environmental education and the science of ecology: Exploration of an uneasy relationship. *Environmental Education Research, 11*(2), 235–248. doi:10.1080/ 1350462042000338388

Leiserowitz, A., Smith, N., & Marlon, J. R. (2010). *Americans' knowledge of climate change.* New Haven, CT: Yale Project on Climate Change Communication, Yale University. Retrieved from http://environment.yale.edu/climate/files/ClimateChangeKnowledge2010.pdf

Lertzman, R. (2004). Ecopsychological theory and critical intervention. *Organization & Environment, 17*(3), 396–401. doi:10.1177/1086026604268009

Lindlof, T., & Taylor, B. (2002). *Qualitative communication research methods.* Thousand Oaks, CA: Sage.

Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder.* Chapel Hill, NC: Algonquin Books.

Macy, J. (1995). Working through environmental despair. In T. Roszak, M. E. Gomes, & A. D. Kanner (Eds.), *Ecopsychology: Restoring the earth, healing the mind* (pp. 240–259). San Francisco, CA: Sierra Club Books.

Macy, J., & Brown, M. Y. (1998). *Coming back to life. Practices to reconnect our lives, our world.* Stony Creek, CT: New Society Publishers.

Malone, K. (2007). The bubble-wrap generation: Children growing up in walled gardens. *Environmental Education Research, 13*(4), 513–527. doi:10.1080/13504620701581612

Marcotty, O. (2011, May 17). Get over "nature-deficit disorder." *The Star Tribune.* Retrieved from http://www.startribune.com/lifestyle/wellness/121900549.html

Mason, J. (2002). *Qualitative researching*. Thousand Oaks, CA: Sage.

McKee, B. (2005, April 28). Growing up denatured. *The New York Times*, p. F1. Retrieved from http://www.nytimes.com/2005/04/28/garden/28kids.html

McKerrow, R. E. (1989). Critical rhetoric: Theory and praxis. *Communication Monographs*, *56*(2), 91–111. doi:10.1080/03637758909390253

Merchant, C. (1996). Reinventing Eden: Western culture as a recovery narrative. In W. Cronon (Ed.), *Uncommon ground: Rethinking the human place in nature* (pp. 91–113). New York: W. W. Norton.

Milstein, T. (2011). Nature identification: The power of pointing and naming. *Environmental Communication: A Journal of Nature and Culture*, *5*(1), 3–24. doi:10.1080/17524032.2010. 535836

Milstein, T., Anguiano, C., Sandoval, J., Chen, Y.-W., & Dickinson, E. (2011). Communicating a "new" environmental vernacular: A sense of relations-in-place. *Communication Monographs*, *78*(4), 486–510. doi:10.1080/03637751.2011.618139

Morello-Frosch, R., Pastor, M., & Sadd, J. (2002). Integrating environmental justice and the precautionary principle in research and policy making: The case of ambient air toxics exposures and health risks among schoolchildren in Los Angeles. *Annals of the American Academy of Political and Social Science*, *584*, 47–68. doi:10.1080/03637751.2011.618139

Opie, J., & Elliot, N. (1996). Tracking the elusive jeremiad: The rhetorical character of American environmental discourse. In J. G. Cantrill & C. L. Oravec (Eds.), *The symbolic earth: Discourse and our creation of the environment* (pp. 9–37). Lexington: The University of Kentucky Press.

Palmer, J. A. (1998). *Environmental education in the 21st century*. London: Routledge.

Pepper, D. (1984). *The roots of modern environmentalism*. London: Croom Helm.

Peterson, T. R., Peterson, M. N., Peterson, M. J., Allison, S. A., & Gore, D. (2006). To play the fool: Can environmental conservation and democracy survive social capital? *Communication & Critical/Cultural Studies*, *3*(2), 116–140. doi:10.1080/14791420600633048

Pinchot, G. (1947/1987). *Breaking new ground*. Washington, DC: Island Press.

Plumwood, V. (1997). Androcentrism and anthropocentrism: Parallels and politics. In K. J. Warren (Ed.), *Ecofeminism: Women, culture, nature* (pp. 327–355). Bloomington: Indiana University Press.

Pratt, M. L. (1992). *Imperial eyes: Travel writing and transculturation*. London: Routledge.

Pulido, L. (2000). Rethinking environmental racism: White privilege and urban development in Southern California. *Annals of the Association of American Geographers*, *90*(1), 12–40. doi:10.1111/0004-5608.00182

Rickinson, M. (2001). Learners and learning in environmental education: A critical review of the evidence. *Environmental Education Research*, *7*(3), 207–320. doi:10.1080/13504620120 065230

Rogers, R. A. (2007). Deciphering Kokopelli: Masculinity in commodified appropriations of Native American imagery. *Communication & Critical/Cultural Studies*, *4*(3), 233–255. doi:10.1080/ 14791420701459715

Schultz, B. (2001). Language and the natural environment. In A. Fill & P. Muhlhausler (Eds.), *The ecolinguistics reader: Language, ecology, and environment* (pp. 109–114). New York: Continuum International.

Segal, H. (2003). From Hiroshima to 11th September 2001 and after. *Psychodynamic Practice*, *9*(3), 257–265. doi:10.1080/1353333031000146789

Shepard, P. (1982). *Nature and madness*. San Francisco, CA: Sierra Club Books.

Stibbe, A. (2001). Language, power and the social construction of animals. *Society & Animals*, *9*(2), 145–161. doi:10.1163/156853001753639251

Strauss, A. (1987). *Qualitative analysis for social scientists*. Cambridge: Cambridge University Press.

Terry, J. (2000). Unnatural acts in nature: The scientific fascination with queer animals. *GLQ*, *6*(2), 151–193. doi:10.1215/10642684-6-2-151

USDA Forest Service. (2009). *Sequoia National Forest.* MyForest summit: Where youth and outside collide. Retrieved from http://www.fs.fed.us/r5/sequoia/my-summit.html

USDA Forest Service. (2010). *Pacific Southwest Region.* News release: Organizations unite to combat nature deficit disorder. Retrieved from http://www.fs.fed.us/r5/news/2009/get2knowpartner-ship.shtml

Wilson, E. O. (1984). *Biophilia.* Cambridge, MA: Harvard University Press.

Wilson, A. (1992). *The culture of nature: North American landscape from Disney to Exxon Valdez.* Cambridge, MA: Blackwell.