The Distinction between Humans and Nature: Human Perceptions of Connectedness to Nature and Elements of the Natural and Unnatural

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Abstract

The perceived separation between humans and nature may have implications for subsequent environmental values, attitudes, and behavior. This research examines people's perceptions of their connection to nature as well as their ideas about what constitutes natural and unnatural environments. We asked participants from three separate studies if they thought of themselves as part of or separate from nature. We also asked participants to list words that came to mind when thinking of natural and unnatural environments. The results show that even though the majority of the participants considered themselves part of nature (76.9%), natural environments were largely described as places absent from any human interference. Gaining an understanding of this apparent contradiction may lead to a better awareness of the importance of people's perceptions of themselves in nature and how that perception relates to general human-environment interactions as well as management and policy.

Keywords: conservation psychology, nature, human-environment interaction, connectedness, environmentally responsible behavior

Introduction

Considerable attention has been paid to the idea that people in western industrialized countries increasingly see themselves as separate from nature. As is specified in the U.S. Wilderness Act (1964), nature is set aside as something pristine and free of the modern human touch. Although many have addressed the issue of the human place in nature, to our knowledge, no one has investigated the role of connectedness to nature on whether residents of developed countries perceive themselves to be part of or separate from nature. To address this question, in the study presented here we asked respondents from three separate surveys in the United States if they considered themselves part of or separate from nature. We also asked them to provide lists of words associated with the natural and the unnatural.

Literature Review

Humans in western and developed countries are thought to have developed a sense of being separate from nature for a variety of reasons. The Enlightenment brought with it feelings of domination over nature. Descartes (1637) advanced the philosophy that human minds and bodies were separate. Other forces in play made it a relatively short logical link to the idea that humans were separate from nature and dominant over it.

With the increasing focus on a scientific and empirical approach to nature came developments in science and technology. Many of these discoveries further enhanced people's abilities to control or transform nature into the pristine gardens present in the biblical story of Adam and Eve. In a review of this notion, Merchant (1996, 137) wrote that "The controlling image of Enlightenment is the transformation from desert wilderness to cultivated garden."

A number of authors have argued that humans were once psychologically and physically closer to nature than residents of industrialized nations are now (see, for example, Eliade 1964; Campbell 1983; Melson 2001; Morris 1998; Nelson 1983; and Shepard 1993, 1996). Advances in scientific

knowledge drove the twin forces of industrialization and urbanization to further split humans from their environments (Franklin 1999). In an analysis of the shift from a land-based economy to an urban and industrialized world, Cronon (1995) spoke of the alienation from nature that resulted. As he and others have pointed out, this shift from a living environment in which humans were closer to nature led to an urban context in which meat comes from the grocery store. Ironically, the very conquest of nature, in combination with the alienation from it, promoted the idea of the sacredness of nature, with legislation enacted in many developed countries to protect tracts of pristine land from human influences. As Vining (2003) and others (e.g. Melson 2001; Winter 1996; Winter and Koger 2004) noted, the affection for pets and gardening may also reflect a yearning for a closer relationship with nature and the natural.

The value that a person places on the environment may play a role in whether or not she views herself as part of or separate from nature. Lamb (1996) proposed that the term "anthrocentric" be used to describe individuals who place themselves in an ethical state above nature. She compared these individuals with biocentric people who place all life at an equal level. Lamb stated that the value we place on nature will have an effect on how we view ourselves in connection with nature.

Nature itself can also be seen as purely a reflection of a person's beliefs and desires (Cronon 1995). Thus, if an individual desires a sense of connectedness with nature, he or she may have a more connected view of nature with humans than would an individual desiring isolation. Likewise, if an individual believes that being a steward of the land requires a separation between nature and self, he or she is likely to view themselves as separate from nature.

An important question is what is meant by nature or to be considered natural? While this may seem like a simple question, researchers, philosophers, and the general public have been addressing it for quite some time. A simple definition for nature does not exist. A search for literature on the subject reveals hundreds of books on the matter, and many more research articles seeking to define nature or to give an historical account of how the difficulties in defining nature came about (see for example Lewis 1967; Soper 1995; Evernden 1992; and Macnaghten and Urry 1998).

In one study, participants in a wilderness camp defined nature as the opposite of civilization. They also said that nature was something that is "out there" without human involvement. Nature was also said to be relaxing and undisturbed, and nature was said to be not at home (Haluza-Delay 2001).

Hartig (1993) offered the transactional perspective of nature, stating that aspects of humans and the environment act in defining each other. Thus, defining whether something is natural or is unnatural requires a person to reflect on a holistic basis. Hartig maintains that dividing the person and environment into discrete elements is not the goal of this perspective. He believes that each entity acts to define the other and is thus interconnected.

Cronon (1995) argued that people should stop putting up borders between themselves and nature. He stated that in order to successfully protect the whole environment, not just small parts of it, one must eliminate these human-perceived barriers. Credence for Cronon's statement is garnered in work done by Schultz (2000), who argues that an individual's level of concern for the environment is directly related to the sense of connectedness the individual feels with nature. Schultz examined the type of concern people have for the environment and discovered three different types of concern: egoistic, altruistic, and biospheric, which he has shown empirically to be three distinct types of environmental orientations (Schultz 2001). In a study of perspective taking, he asked participants to imagine how they might feel or think if they were the people in a set of images of humans in various environments. Schultz concluded that participants reduced their level of separation between themselves and nature, which then led to an increase in their biospheric concern for nature. Furthermore, Schultz et al. (2004) stated that the connection an individual feels with nature is implicit or unconscious. Therefore, the use of techniques like perspective taking might enable an individual to bring their awareness of their connection to nature to a more conscious level. However, it is quite possible that the connection an individual feels with nature cannot be altered, but perhaps making people more aware of their views would lead to conscious thought on the issue.

Individuals in developed countries tend to view some natural areas as worth protecting, while ignoring physically similar natural areas. Schroeder (2002) argued for the importance of maintaining special places, which are areas in the natural environment that a person values for aesthetic or emotional reasons (or both). Public participants defined these special places as areas that are natural, serene, act as a refuge and have an element of beauty, among other things. These special places are areas that people can go to experience nature. Schroeder noted that an individual's concerns over public land management are likely to be affected by their feelings toward their special place(s). Thus, working with feelings toward various natural areas may help to attract the support of people who normally are indifferent to conservation issues.

We believe it is important to understand what people construe as natural or unnatural and to examine whether people view themselves as part of or separate from nature. First, while there has been significant attention paid to categorizing

humans as anthropocentric or biocentric (just one of several typologies), we are not aware of another study that has asked people to specifically define themselves as part of or separate from nature or to ask directly for reasons why. Secondly, the connection between a definition of oneself as natural or unnatural may have implications for environmental action. It seems to be possible for people to view themselves as a part of nature, but then define nature as the non-human world. This difficulty in conceptualizing the role of humans in the ecosystem may lead to behaviors, beliefs, or attitudes, which are either environmentally responsible or irresponsible. Thirdly, since feeling connected to nature is thought to be a predictor of environmentally responsible behavior and overall well-being of the individual, it is important to elucidate why there are differences between individuals in how connected they are with nature (see Mayer and Frantz 2004 for review).

Method

Table 1. Number of Participants by Year for Each Survey Item

Survey Item	1997	2003	2005	Total
Part of/separate from nature	52	105	25	182
Listed natural items	59	113	25	197
Listed unnatural items	60	111	25	196
Total participants	60	113	25	198

Participants

The data for this study came from three separate questionnaires administered in 1997, 2003, and 2005. In each of these questionnaires, we asked participants to indicate whether they thought they were part of nature or not, and why, and then asked for words associated with natural and unnatural environments. The number of participants who answered each item for each year is shown in Table 1.

The 1997 participants were randomly selected residents of Cook and DuPage counties in Illinois (See Vining et al. 2000) from a mail survey of reactions to ecosystems restoration proposals (response rate = 33%). Roughly half of the 2003 participants were randomly selected residents from counties bordering or containing parts of the Superior and Chippewa National Forests in northern Minnesota, while the other half were randomly selected Minnesota residents living in Minneapolis and southern Minnesota counties. These participants were enrolled in a study of fire management choices (response rate = 29.3%). Because these first two groups may have been affected by the context of the larger surveys, we collected additional data from University of Illinois at Urbana-Champaign students, whom we randomly selected (through the most recent undergraduate and graduate student

directory) to participate in an e-mail survey in 2005. They responded only to the questions presented here (response rate = 31.3%).

Procedure

In each of the questionnaires, we asked participants to write responses to the following questions:

1. Do you consider yourself as part of or separate from nature? Explain.

2. What words come to mind when you think of a natural environment?

3. What words come to mind when you think of an unnatural environment?

Results and Discussion

For the purposes of this paper, we combined the three data sets in the presentation of our results. Our qualitative analysis of the data sets from these three items uncovered many categories and subcategories, very few of which revealed differences by year of administration. Because there were no systematic differences among the three data sets, we combined the data for the analyses presented here. Our sample is somewhat diverse, but not representative of the U.S. population, and we were cautious in interpreting the results.

All data were taken verbatim from the written questionnaires and e-mail responses. We compiled the replies to the three items of interest and analyzed the responses item by item. Three independent investigators separately conducted content analyses of all of the responses to each item. Together, we reviewed our independent analyses and developed an all-inclusive unique coding scheme for each item. We developed this coding scheme using a grounded analysis approach, meaning the coding categories emerged from the actual data, not any preexisting categories of the experimenters.

We entered the coding scheme, along with the responses from each participant into the QSR N6 qualitative software program. We then coded each participant's response for each item based on the coding scheme developed by our content analysis. One researcher coded the text and another reviewed the coding to ensure accuracy and reliability. In our analyses we assumed that the importance of a particular category of meaning can be demonstrated either by its frequency of mention, or by an important connection to theory. In other words, we include noteworthy but infrequent categories in our analyses as well as the most frequent responses.

Connectedness to Nature

In the first item, we asked if participants considered themselves as part of or separate from nature. We also asked that they explain their responses to this question. We coded

Table 2. Connectedness to Nature Item by Response

Coding Category	Number of Responses	% Total Responses
Part of	140	76.9%
Separate	22	12.1%
Both	19	10.4%
Neither	1	.5%
Total	182	100%

the responses into four mutually exclusive categories based on our content analysis of the data. The results are depicted in Table 2.

Most of our respondents considered themselves to be part of nature. A much smaller percentage wrote that they considered themselves either separate from nature or both

part of and separate from nature, and only one respondent said that he/she was neither part of nor separate from nature.

We were especially interested in the reasons why participants considered themselves as part of or separate from nature. In Table 3, we show the first- and second-degree coding categories that we developed along with definitions and the frequency with which participants mentioned each of the categories in their explanations of this item. These first-degree coding categories include several subcategories or second-degree coding categories. These categories are not mutually exclusive and participants may have mentioned several elements of these first-degree categories in their responses, resulting in a larger number of responses than participants. Because there was only one participant who believed he/she

Table 3. First and Second Degree Coding Categories and Frequency of Occurrence

Coding Category	Part of	Separate	Both	Total
BY VIRTUE OF CONNECTEDNESS	83	14	16	113
Interdependence (human-nature dependence)	31	-	2	33
Shared essence (humans part of biosphere/ecosystem, humans biological organisms)	22	-	2	24
Connectedness (humans' inherent connection to nature)	17	-	2	19
Shared habitat (humans share same space, surroundings, and earth as nature)	9	-	2	11
Closeness (nature in close proximity to humans)	4	1	-	5
Independence (humans don't rely on nature, nature takes care of itself)	-	2	2	4
Lack of contact (living in climate-controlled space, lifestyle not involving nature, not living or spending time in nature)	-	11	6	17
BY VIRTUE OF ACTION	83	10	10	103
Resource (nature provides food, air, water, and shelter)	31	1	3	35
Recreation (hiking, hunting, camping, etc.)	21	-	2	23
Residence (urban/rural residence of humans in relation to nature)	13	9	5	27
Stewardship (humans living in harmony with nature, maintaining natural areas)	10	-	-	10
Environmentally responsible behavior (recycling, conserving energy/water, composting, etc.)	5	-	-	5
Interaction with animals (relating to/observing nonhuman animals)	3	-	-	3
BY VIRTUE OF AFFECT	57	1	8	68
Care for (caring for nature, a responsibility towards nature)	22	-	1	24
Enjoyment (enjoying time in nature)	12	-	3	16
Love (loving nature)	7	-	-	7
Morality (realizing effects of human actions, moral reasoning, right or wrong thing to do)	7	-	1	8
Spirituality (god, religious philosophies, general spirituality)	4	1	3	8
Peace/tranquility (feelings of peace/tranquility while in nature)	4	-	-	4
Well being (feeling a sense of well being while in nature)	1	-	-	1
BY VIRTUE OF DEFINITION	26	-	4	30
ATTRIBUTES	10	1	1	12
CONTRADICTORY STATEMENTS	2	2	6	10
OTHER REASONS	33	3	8	51
Affect one way (humans affecting nature, nature affecting humans)	15	2	2	19
Responsibility (humans have responsibility towards nature)	9	-	1	10
Domination/subjugation (humans over nature, nature over humans)	6	1	5	12
Legacy (leaving legacy for future generations)	3	-	-	3

was neither a part of nor separate from nature, we eliminated that column in Table 3 for clarity.

The highest frequencies in participants' reasons for being part of or separate from nature were in the first degree category of connectedness. In Table 3, we show the frequencies of responses for the subcategories within the connectedness category.

Table 3 shows that many of our participants who considered themselves as part of nature cited interdependence, shared essence, connectedness, shared habitat, and closeness as reasons for being a part of nature. The following quotation illustrates this sense of connectedness.

> *I consider myself part of nature without a doubt. Physically speaking, nature is surrounding us. Trees, animals, the environment outside, etc... But within all of the animals and plants we as humans make up the environment as well; we are a vital part of nature. Everything we use and eat comes from the animals, and the trees and the things outside around us. Also, we all as humans come from each other. We are born from our parents, who came from their parents. We are all part of a cycle of nature that evolves through time.*

Although the number of participants in categories other than 'part of' are small we believe it is noteworthy that many of those who considered themselves separate from nature discussed issues related to lack of contact with nature and independence from nature as in this quotation.

> *Separate from nature: living in big city since childhood; too busy to enjoy nature; not an activist in environment protection; difficult to find 'all' natural places.*

Interestingly, most of the participants who stated that they were both part of nature and separate from nature cited that they were a part of nature because of elements such as interdependence and connectedness, but separate from nature because of a lack of contact with nature.

> *Separate because I feel I can artificially survive in today's world without much of nature affecting me; Part of, because, in reality I can't really survive without it at all.*

In Table 3, the second most frequent first-degree category that participants addressed was relationships (or lack thereof) with nature by virtue of their actions. We also show the subcategories of the broad category of action.

The majority of participants who discussed action categories in response to this item spoke about nature as a resource, nature as recreation, and people's relationship to nature dependent on their residence location. The following

participant, who considered himself part of nature, referred to these categories.

> *Part. I live on a lake. We strive to do everything we can to preserve this natural resource. Yet we need to realize some things have to be given up to enjoy the recreational part of the lake.*

Participants who considered themselves as part of nature described many of these actions in a manner that indicated that involvement with these activities justified considering oneself as part of nature. In many cases it seemed as if one must earn being a part of nature by participating in these activities and environmentally responsible behavior. The following quotation illustrates the connection of perceiving oneself as part of nature and acting in an environmentally responsible manner.

> *I'm not perfect, but I feel I am a part of nature. I make mistakes, but I try to recognize nature. I recycle, I take public transportation, etc.*

It is apparent, however, that many participants who considered themselves as separate from nature also wrote about the location of human residences in relation to nature. The residence category, similar to the lack of contact category in the connectedness items, seemed to act as a justification for the participants who thought they were separate from nature and both part of and separate from nature. Even though some of these participants believed they were part of nature, their place of residence led them to feel separated from nature. One participant noted:

> *For the most part I am separate from nature because I live in a city while I am at school. I feel more part of nature when I am at home because we live in the country where there is a more natural surrounding.*

In the action oriented category, those who thought of themselves as part of nature covered all of the subcategories (resource, recreation, residence, stewardship, environmentally responsible behavior, and interaction with animals). Those who thought of themselves as separate from nature almost exclusively discussed their place of residence in their reasoning.

> *Separate. I live in a climate controlled home, drive a climate controlled car on human built surfaces, and buy food pretreated and packaged in a human built store.*

The next most frequently occurring first-degree category involved affective responses from our participants. In Table 3, we show the details of the subcategories within the affect-

oriented responses, which involved responses dealing with the emotional realm. The way we defined each category (based on participants' language) is listed in parentheses.

There were, again, clear distinctions between our "part of" and "separate" participants in the frequency with which they mentioned affective elements in their responses. The emotions that we identified were mostly drawn from participants who thought they were a part of nature. The following participant expressed many affective elements, as well as others that we have discussed previously.

> *As part of. If you enjoy hunting-fishing etc. — you love nature — that makes you part of it. We need to take care of what we have. Have you ever sat in a tree and watched the geese fly in and you can see the whites of their eyes? That's nature — or the whites of a deer or Elk's eyes when you can sit there that close — that makes you part of nature.*

The emotions that we identified in the responses to this question were all positive. This supports several decades of research on environmental emotion (such as Ulrich 1981), in which positive emotions were associated with natural environments. Vining (1987) showed that emotions were related to environmental decision-making. Specifically, positive emotions were associated with decisions to develop the environment and negative emotions were associated with preserving the environment. Our data lend support to these studies, first in replicating the association of positive emotions with natural environments, and second in reinforcing the idea that decisions to preserve natural areas are associated with negative emotions because these areas are so strongly associated with positive emotions. Moreover, in the present study, we found that positive emotions, such as caring, love, and enjoyment, were related to feelings of being a part of nature.

Spirituality is a second degree category that we derived from only eight comments. However we believe that this is an important finding because of the depth of feeling in comments in this category. These reports also lend support to research focused on green spirituality (e.g., Hitzhusen 2007; Kempton et al. 1995; Schroeder 1996; Williams et al. 1992). The following quotation from a participant stating he/she was part of nature illustrates the spiritual connection.

> *I believe in the Christian view of nature — that creation is a wonderful gift of God, and we are to take care of it. So we are part of it and we rule over it in a responsible way.*

We showed in Table 3 that many participants discussed their level of connectedness to nature a priori. In this first degree category, which we did not subdivide, we grouped responses that discussed the inherent belief that humans are a

part of nature purely by definition. As indicated in Table 3, only respondents who believed that they were a part of nature to some degree cited this rationale as the following quotations illustrate.

> *Part of nature. We are here just as all else is here.*

> *I feel a part of nature because all living species are a part of nature. Human beings are not manufactured.*

The first degree category of attributes in Table 3 covered those responses that discussed elements of nature such as animals or wilderness. In addition, the contradictory statements category included responses, such as the following, that we interpreted as being contradictory in character. As one might expect, respondents who considered themselves both a part of and separate from nature wrote many of these contradictory statements.

> *Both because it just all depends on what I need or have to do. Example: When I walk outside I feel like I'm part of nature. But when driving & using products that aren't good for the environment ... makes me feel like I am apart from nature.*

We grouped many other categories into a miscellaneous "other" category in order to organize the presentation of these data, not to diminish the meaning of any of the subcategories. In Table 3, we show the subcategories and frequency data related to these items.

Many of the participants who considered themselves a part of nature wrote about either humans affecting nature or nature affecting humans. We coded these responses as "affect one way" to differentiate it from the interdependence category in the connectedness metacategory. Nine of our "part of" participants also mentioned that humans have a responsibility towards nature to protect it and manage its resources wisely. The domination/subjugation category included responses in which participants discussed a hierarchical relationship between nature and humans, such as humans over nature or nature over humans.

To summarize, the vast majority of participants believed that they were a part of nature, while lesser numbers believed that they were separate from nature or both part of and separate from nature. Those who believed that they were a part of nature discussed a broad array of reasons, most notably in relation to their level of connectedness with nature, actions within nature, emotional feeling while in nature, and the idea that humans are a part of nature by definition. Those who believed that they were separate from nature mostly wrote about a lack of contact with nature and not living near or within na-

ture. We also identified several positive emotions, such as caring, enjoyment, and love related to those who believed that they were a part of nature. These positive emotions were absent in the responses of those who believed they were separate from nature, indicating a positive association between connectedness to nature and positive emotions.

Words Depicting Nature and the Natural

In the second questionnaire item, we asked participants to list words that came to mind when thinking of a natural environment. Most participants listed several words, which we individually coded according to our coding scheme developed using the same grounded theory approach as in the previous item.

In Table 4, we show the coding scheme we developed as well as the number of participants in each group (part of or separate) who mentioned each coding category.

Table 4. Natural and Unnatural Words and Number of Participants Who Mentioned them

Natural Words Coding categories	Total Frequency N=197	Part of Frequency N=130	Separate Frequency N=30
Undisturbed by humans	76	42	14
Pure/clean	50	34	2
Peaceful	37	24	5
Beautiful	33	23	1
Preserved land	24	9	7
Uninhabited	18	10	2
Not human-made	17	9	3
Sensory	15	5	2
Development issues	15	7	4
Balanced	13	10	-
Designated areas	13	8	1
Open space	11	6	3

Unnatural Words Coding categories	Total Frequency N=196	Part of Frequency N=130	Separate Frequency N=22
Human-made entities	60	37	8
Pollution	56	40	9
Industrial material	55	34	6
Cities/urban areas	49	29	12
Disharmony/altered	47	35	5
Buildings/structures	46	32	7
Emotion/sensory	37	25	4
Roadways	34	22	4
Residential buildings/areas	30	18	3
Vehicles	25	16	2
Evidence of development	24	18	1
Evidence of waste	23	17	3
Evidence of commerce	22	12	6
Factories/industrial sites	22	16	4
Crowding/cluttered	17	13	1
Lack of vegetation	16	7	2

When listing natural words, our participants most frequently mentioned undisturbed environments. These participants viewed natural environments as places that were free of any human disturbances as illustrated by the following quotations.

Untouched by man [sic], the earth.

Trees, Animals, grasslands, wetlands, mountains. Never touched or altered by humans.

Similarly, the next most frequently mentioned attribute that participants addressed was a pure or clean environment. Participants also fairly frequently mentioned peaceful and beautiful environments. Evidence of these attributes is present in the following quotation.

Beauty, Serenity, Calm, Peaceful, Pristine, Tranquil.

The next three most frequent categories involved environments that did not include humans or human-made entities. When thinking of natural environments, participants cited preserved land, such as forest preserves, uninhabited areas, and non human-made entities.

Unspoiled, "Natural" — of Nature, Sounds (of "Nature") — or absence of sounds of civilization. National Parks, Chicago-area forest preserves, Absence (generally) of evidence of mankind's [sic] presence, Antarctica, much of Western Colo, Utah, Ariz.

In the 12 most frequently mentioned natural attributes, six (undisturbed, preserved land, uninhabited, not human-made, development issues, designated areas) involved words indicating that nature and the natural were understood as being free of humans and human influences. The other attributes in the top 12 natural words involved how humans perceive nature in terms of how it looks (beautiful, pure/clean, sensory, open space) and the feelings it elicits (peaceful, balanced), which the following quotation illustrates.

Pleasing, soul satisfying, beautiful, quiet.

Interestingly, the most frequently occurring natural attribute, 'undisturbed by humans,' was not only mentioned by 63.6% of participants who considered themselves separate from nature, but also by 32.3% of participants who considered themselves a part of nature. This indicates that even some of the participants who considered themselves as part of nature still perceived nature as an entity that does not involve humans.

Words Depicting the Unnatural

Finally, we asked participants to list words that came to mind when thinking of an unnatural environment. As in the

previous item, most participants listed several words, which we individually coded according to our coding scheme developed using the same grounded theory approach. In the bottom half of Table 4, we show this coding scheme as well as the number of participants in each group (part of or separate) who mentioned each coding category. The number represents the actual number of participants who mentioned words related to the coding category, not the number of times the coding categories were mentioned by the participants.

When we asked participants to write words that describe unnatural environments, they most frequently mentioned human-made elements of the environment. This follows the trend we observed in the words associated with nature wherein participants conceptualized nature as places that do not include humans or any human-made substances. In fact, 13 of the top 16 categories that our participants listed for unnatural environments (human-made entities, pollution, industrial materials, cities/urban areas, buildings/structures, roadways, residential buildings/areas, vehicles, evidence of development, evidence of waste (human), evidence of commerce, factories/industrial sites, crowding/cluttered) involved human activity to some degree. The following quotations illustrate some of these categories as well as the idea that human involvement in nature is unnatural.

> *Concrete, pollution, buildings, highways, electric and phone wires, change done by people, cities, suburbs.*

> *High-rises, concrete, cities, factories, pollution, man-made [sic]*

The other three unnatural attributes in the top 16 categories involved how humans perceive and react to unnatural environments and include disharmony/altered, emotion, and a lack of vegetation as the following quotations illustrate.

> *Disgusted, Cutting down trees to make room for more condos.*

> *Jarring, discordant, tainted.*

> *Busy, noisy, populated, out-of-synch.*

In this dataset, we observed higher percentages of "part of" participants who defined unnatural environments as influenced by humans than we expected. For example, the most frequently mentioned (overall) unnatural attribute was human-made entities. Nearly 28% of the participants who considered themselves part of nature mentioned human-made entities within their listing of unnatural words. An even higher percentage (29.9%) of "part of" participants mentioned pollution, another attribute defined by human influence.

General Discussion

The main finding from this study was that even though the large majority of our participants considered themselves as part of nature, their general perception of natural environments excluded any humans or human involvement while their general perceptions of unnatural environments included mostly human-made entities. It seems that most of our participants had the idea that nature involved pristine preserved land that is uninhabited and unaltered by human beings.

This seemingly contradictory finding may explain the separation from nature that many people expressed even though they considered themselves as inherently part of nature. In the two most commonly occurring groups of reasons that participants gave for being a part of or separate from nature (connectedness and action), a lack of contact and lack of everyday closeness (location of residence) were used as justifications for why humans may be separated from nature even though they are essentially part of it. This finding suggests that a lack of contact with natural environments and an increase in contact with (human) built environments may lead people to feel more separate from nature even though they believe that humans are inherently a part of nature.

Schroeder (2002) suggests that the examination of human-nature connectedness is contextualized by people's experiences of actual places and environments in their lives. Thus, the experience of place may be directly tied to one's connectedness with nature. As the data in our study suggest, people may feel more connected to nature the greater the amount of time they spend in what they conceive to be natural environments. This finding is supported by work done by Kals et al. (1999), which showed that present and past frequency of time spent in nature are predictors of emotional affinity and interest in nature. Similarly, Mayer and Frantz (2004) found that amount of time spent outdoors was positively related to how connected an individual felt with nature.

This finding is further illustrated by the high frequency of action-oriented responses to the reasons for which people perceived themselves as part of or separate from nature. Our participants who considered themselves part of nature, highlighted actions within natural environments, such as recreation, place of residence, stewardship, and environmentally responsible behavior. This suggests that humans may become more a part of nature if they participate in these types of actions on a regular basis, therefore earning the right to be considered a part of nature. This finding also suggests that perceived relationships to nature are consistently shifting depending on the frequency of certain activities within or related to natural environments.

Another explanation as to why people think of themselves as part of nature, but sometimes define nature as ab-

sent of human interferences, is that the human-nature relationship may not be conceptualized as a dichotomous one. Instead of viewing humans as *either* part of *or* separate from nature, participants may be viewing humans as simultaneously part of and separate from nature. In fact, Schultz (2002) developed the Inclusion of Nature in Self (INS) scale as a means of placing the human-nature dichotomy on a continuum represented by a series of overlapping circles. The circles were labeled as either self or nature, thus allowing participants to select the amount of overlap they felt best represented how much a part of or separate from nature they felt. Other researchers have also employed more of a scale system to investigating the human-nature relationship (see, for example, Kals et al. 1999; Clayton 2003; Mayer and Frantz 2004). Even though our questionnaire item seemingly forced participants to choose being part of nature or separate from nature, 19 (10.4%) of our participants stated in their responses that they were *both* part of *and* separate from nature.

Drawing from the literature on cognitive linguistics, Schroeder (2007) suggests that the human-nature relationship may be perceived as a 'cluster concept' in which a prototype concept is linked to a cluster of meanings that may or may not be completely congruent with each other. For example, the prototype concept of a primeval forest may form the center of a cluster of concepts such as ecosystem restoration, a self-sustaining forest, absence from human manipulation, and a managed forest. In Schroeder's model, incongruity stemming from competing concepts is managed by a cognitive system that permits sorting of concepts linked to the prototype but not necessarily to each other.

Along these same lines, Hartig's (1993) transactional perspective provides us with a similar explanation for understanding how individuals can see themselves as a part of nature, while defining nature as lacking human contact. In the transactional perspective both natural and non-natural (or built) elements work to define each other, and are thus not exclusive entities. This perspective suggests a more holistic look at how individuals view themselves in relationship with the natural and non-natural (built) world. Whether an individual views him/herself as part of, separate, or both, is defined by his/her experiences with both the natural and the non-natural. This perspective would suggest that the amount and type of experiences an individual has with both the natural and non-natural world will shape his/her definition of what is natural and what is non-natural. This perspective also suggests that an individual's perception of his/herself in his/her environment is fluid, or constantly changing based on new experiences. It is possible then, that individuals might feel that he/she is more a part of nature on some days, while feeling more separate from nature on other days, depending on his/her recent experiences. Further support for this idea of

fluidity comes from Frantz et al. (2005) who showed that manipulation of participant's self-awareness was enough to alter how connected an individual felt to nature.

Limitations

The idea that the human-nature relationship may not be dichotomously defined in people's perceptions of self-nature concepts and mental processes is a potential limitation of this study. In addition, the fluidity of perceptions of self-nature concepts may complicate the matter further. A thorough understanding of people's concept of their connectedness to nature and their definitions of what natural and unnatural environments include is certainly more complicated than the questions we posed to our participants. However, we intentionally designed our questions based on theory and history indicating that there is a human-nature split in western and developed countries, and that conflict (or cognitive dissonance) may result from that split. We believe that our data give us a stance from which we can better understand the complex perceptions of the self-nature relationship. Work done by other researchers has allowed participants more of a continuum with which to place their connection with nature (e.g., Mayer and Frantz 2004; Schultz 2002; Clayton 2003).

A competing explanation for how individuals might be able to view themselves as part of a nature that they define as absent of humans and human constructions stems from multiple definitions of nature (see, for example, Lewis 1967; Soper 1995; and Macnaghten and Urry 1998). Our first question asked participants simply if they felt they were a part of or separate from nature, while our second and third questions asked participants to define natural or unnatural environments. Adding the term "environments" may have focused participants into a different definition of nature than they were using for the first question. However, we kept the wording of questions unchanged from the first year of data collection in order to allow comparison across the three years. A future study consistently using the word "nature" in the framing of the questions could be employed along with the use of specific situational contexts for participants to frame their thinking when responding to the questions. This would eliminate some of the potential for the researchers to influence how participants chose to define "natural" and "unnatural" and also allow for comparisons on how these words are defined depending on the framing of the question.

The data from this study came from three separate questionnaires administered to three different Midwestern populations. Two of these questionnaires were administered within the context of larger surveys (1997, 2003). We addressed the potential influence of the elements within these larger questionnaires by administering the 2005 questionnaire, which contained only the three questions addressed in this

study. We compared responses from the three data sets but we found few differences and no systematic differences. We believe that the sample differences that did exist were beyond the scope of an already complicated study, and not particularly noteworthy as well. However, the three populations from these studies are all Midwestern American populations, which threatens the external validity of the study. Certainly future studies should seek a more diverse and representative sample.

Implications

The finding that the concept of self-nature relationships is in some way conflicted with participants' perceptions of natural and unnatural environments may have implications related to environmental values, attitudes, and behavioral research. This contradiction in the minds of people may reflect cognitive dissonance that can complicate decision-making and performing environmentally responsible behavior. Cognitive dissonance occurs when people have two contradictory thoughts, ideas, or feelings about a concept (Festinger et al. 1956). The dissonance is unpleasant and will generally lead a person to relieve herself of the contradictory perceptions by rationalizing or denying subsequent thoughts and behavior. Even though our participants generally perceived themselves as part of nature, most perceived natural places as independent from human contact and interference, thereby creating dissonance. Resolving this conflict in perceptions might lead to greater levels of environmentally responsible behavior. However, the opposite path, in which people who consider themselves as part of nature rationalize environmentally destructive behavior in order to relieve dissonance, is possible as well. Future research should address how people's mental processes and perceptions of self-nature relationships are associated with environmentally responsible or destructive patterns of behavior.

Studies such as this help us to gain a better understanding of the complications of managing our natural areas. We know from previous work that the level of connectedness an individual feels towards an environment will affect level of concern for, and management decisions towards that environment (Schroeder 2002; Schultz 2000). Analyses of our data indicate that the connection an individual feels towards nature may be more complex than a dichotomous choice. Better understanding of the human-nature relationship is essential to form constructive and appropriate environmental management and policy.

Endnote

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