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Artifacts in the experience of fuzzy "nature": A commentary

Raymond Chipeniuk, University of Northern British Columbia

Raymond Chipeniuk
School of Planning and Sustainability
University of Northern British Columbia
3333 University Way
Prince George, BC V2N 4Z9 Canada
Raymond.Chipeniuk@unbc.ca

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ABSTRACT

Many peer-reviewed research publications have concluded that "experience of nature" is beneficial for mental health and well-being, but virtually all of them offer only fuzzy definitions of "nature," or none at all, and the "nature" to which subjects are exposed is itself fuzzy. This commentary argues that accounting for the two kinds of fuzziness are the underappreciated roles of *artifacts* and *natural kinds* (as understood by cognitive psychologists and philosophers of science) in both researcher and subject thinking which involves quasi-natural places and scenes. Artifacts, if discerned, adulterate what might otherwise be considered "nature." They arouse thinking about the intentions behind them and in doing so they may trigger rumination. Rumination is associated with depression and other undesirable mental states, now rampant in urban populations. Instances of natural kinds, by definition and in contrast, generally do not express human intentions, so attending to them entails less rumination. The commentary suggests several potential explanations for why exposure to fuzzy "nature" may be healthful despite the fact that a "green" landscape or scene abounds in artifacts. It ends with some implications for research and park practice.

Keywords: Experience of nature; fuzzy nature; artifacts; Theory of Mind; park planning; park management

INTRODUCTION

A curious thing about the now voluminous research literature on the mental health benefits of experience of "nature" is that it has almost nothing to say about traces of human agency in the experimental conditions. It is like the Sherlock Holmes story about the dog that didn't bark—what is missing explains the case.

Much of this commentary is dedicated to presenting evidence that published research on the experience of nature depends on vague and unscientific conceptions of "nature," often leaving the word itself entirely undefined. As the commentary unfolds, it will not offer any definition of its own. Instead, it will argue that what laypersons experience, and cognitive researchers typically test, is "fuzzy nature"—scenes or objects incorporating both natural kind phenomena and products of human agency (as explained below). Its purview is principally cognitive; it is not concerned with studies interpreting allegedly natural scenes or landscapes according to their patterns or geometry or texture or other physical characteristics.

In 1989, a book by Rachel Kaplan and Stephen Kaplan, *The Experience of Nature*, summarized and put a name to psychological research on the mental health effects of exposure to "nature," a term applied to a wide array of examples and explicitly including such things as flower gardens and urban parks. Contemporaneously, a separate body of research was demonstrating that children and adults have an inborn proclivity to set natural kinds of entities apart from artificial and social kinds (e.g. Keil 1989; Carey and Gelman 1991). Then the philosopher of science Eric Katz published an article (1993) explaining why researchers should distinguish between natural entities and artifacts: Artifacts, but not natural entities, embody human intentions. As it turned out, lines of research depending on the idea that test participants experience "nature" even when it is mixed with artifactuality have been the ones that prevailed, and still prevail. The gist of this commentary is that when studies fail to take into account the artifacts and artifactuality in their experimental settings, not only are the nature "treatments" fuzzy but so are the experimental results.

The commentary has four main parts. Part I cites evidence that fuzzy specifications of "nature" are a feature of nearly all studies on the health effects of nature experience. Part II argues that experience of nature investigations typically omit any exact inventory of artifacts and artifactuality in the materials or situations to which subjects are invited to react. Part II also introduces the key features of artifacts, namely their intentionality and their engagement of "theory of mind" cognitive phenomena. Part III speculates about reasons why experience of nature studies may ignore artifactuality in their treatments yet still succeed in identifying positive relationships between exposure to "nature" and health and well-being. In Part IV, the commentary concludes with some examples of how recognizing artifacts and artifice in places often considered instantiations of "nature" could have serious implications for fields such as park planning and mental health and well-being.

I. THE PREVALENCE OF EXPERIMENTAL CONDITIONS OF "FUZZY NATURE" IN NATURE-EXPERIENCE STUDIES

Various reviews have documented the absence of definition in what health and cognitive investigators have taken to be "nature" in the experience of research participants. See, for instance, Jimenez et al. (2022), Labib et al. (2022), and Nejade et al. (2022). Almost without exception, researchers assume "nature" has a reference that is self-evident, or they just illustrate it through examples or photographs, or they equate it with whatever has been their experimental condition (Ducarme and Couvet 2020). Common cases of what authors have considered to be "nature" include ornamental trees seen through a window, gardens, urban greenspace, and scenes projected on computer screens, although, as Ducarme and Couvet (2020) point out, the standard scientific definition, when there is one, is "The whole of material reality, considered as independent of human activity and history" and the opposite concept is "culture, artifice, rational intention." Regularly, exposure to "nature" in cognitive and health studies is found to produce such beneficial results as reduction in stress (Ewert and Chang 2018), improved ability to concentrate (Mason et al. 2021), and a heightened sense of well-being (White et al. 2019). Some real phenomenon must reside within this cloud of undefined or vaguely defined "nature" as a force in human cognition and emotions, but if not nature as the natural sciences and philosophy of science have traditionally understood it, then what?

A second major definitional problem is that in careful scientific discourse, *"nature" is just an abstract conception*, not a place, not a directly perceptible phenomenon. It is true that in modern English and other European languages "nature" seems to be something real, so real its presence or absence is available to common sense. But until recent times, as attested by the *Oxford English Dictionary*, most speakers of demotic English have been disposed to think not of *nature* but of *natures*—the inborn or inherent properties of kinds of phenomena repeatedly instanced in the world (and not necessarily connected with each other). Indeed, according to Videen (2023: 167), Old English had no word for "nature." "'Nature' didn't appear in English until the thirteenth century … and it wasn't until the end of the fourteenth that 'nature' referred to plants and animals as opposed to humans and human-made objects."

The modern Western concept of nature as being the *interrelated whole* of everything not made by human beings arose in publications of the European polymath and explorer Alexander von Humboldt, who captured the imagination of the Western world in the middle decades of the 1800s (Wulf 2015). In other words, the idea that nature is a "thing" is not a human universal but a cultural particular. But in the opinion of many experts, culturally specific perceptions of "nature" lie beyond the proper or core subject-matter of psychology (e.g., Norenzayan and Heine 2005; Atran and Medin 2008).

Perhaps a social constructivist analysis could legitimately claim that there is a nucleus of universal reality at the heart of what people variously refer to as "nature" even while they represent it in varying ways (cf. Proctor 2010). An immediate difficulty with this approach is that certain cultures construe "nature" as nothing at all. Sheila Watt-Cloutier (no date), a distinguished Inuk of Ungava Bay, Canada, says that "In our language we have no word for 'nature.'" Nor is Inuktitut unique in this respect. Many other Indigenous languages have no word for "nature" (Reed et al. 2024).

Disturbingly, it is possible that the concept underlying much cognitive research on "nature experience" derives not from science but from Romantic literature. Most of the English-speaking world reads some of the poetry of William Wordsworth (1770–1850) in school textbooks, and Wordsworth repeatedly personifies Nature and capitalizes the word: "… knowing that Nature never did betray the heart that loved her…." So does Henry David Thoreau (1817–1862), whose powerful essays have influenced the minds of generation after generation of North Americans. According to Kirchhoff (2024), non-church sacralizations of nature emerged alongside Romantic aesthetics in Western societies in the 1800s and have ramified and spread, in seven or more other types, across the modern world. Interestingly, early technical articles on the psychological effects of views of planted trees themselves capitalize "Nature" (e.g., Tennessen and Cimprich 1995).

Ducarme and Couvet (2020) canvass a wide range of publications in various disciplines concerned with the psychology of "nature" and find definitional weakness to be almost universal. Barnes et al. (2019) conducted a meta-review of 30 studies reporting significant associations between nature exposure and positive mental health outcomes and stated in summary that "Most studies did not describe the 'nature of the nature' associated with positive mental health outcomes" (p. 1). Broadly across this field, anything green in color and biological, especially outdoors, is regarded as ipso facto a local instance of nature. Inevitably, acting on this assumption, researchers have operationalized "nature" in widely varying ways. Some studies effectively let subjects themselves determine whether their activity was or was not carried out in "nature" (e.g., Bratman et al. 2021).

As Barnes et al. (2019) observe, findings from studies indulging in this kind of idiosyncratic selection of experimental conditions can have little influence on planning and design. Moreover, the problem extends to theory, as in Tomasso and Chen (2022), which claims to define "nature" along multiple axes such as indoors versus outdoors (p. 283) but in fact never states what the authors take the common element among categories of "nature" to be.

The same is true of "greenspace." The casual assumption that "green" is acceptable shorthand for "natural" has been adopted, or replicated, broadly across research and practice involving outdoor landscapes, including park planning. Taylor and Hochuli (2017), in their review of 125 journal articles concerned with "greenspace," found that less than half of them provided a definition for the term, and in the remainder, the definitions were of many different sorts. Taylor and Hochuli mildly observe that when scientific researchers appear to have no shared understanding of what they are studying, their findings fail to accumulate in a progressive manner.

II. FUZZINESS IN EXPERIMENTAL "NATURE" ARISING FROM ARTIFACTS AND ASSOCIATED INTENTIONS

Much of the fuzziness in research into "nature experience" surely stems from a state of affairs in which experimenters omit consideration of artifacts and artifactuality such as traffic noise, graffiti, landscaping, or regimentation of human behavior in their setting or condition of interest. ("Artifact" can be defined in many precise ways—see for instance Sperber 2007, pp. 125–137—but for the purposes of this commentary, any product of human intention, discernible in any sense modality, is an artifact.) Recognition and precise description of artifacts in the experimental context matter because (1) artifacts express intentions (Dennett 1988; Katz 1989); (2) shifting focus to intentions potentially implicit in artifacts in a scene can distract a person from his or her mindful stream of attention to natural entities; (3) natural entities are largely free of human intentions; (4) mindfulness is associated with psychological well-being (Keng et al. 2011); and (5) failure to understand the cognitive role of *natural kinds* or *natural entities* (as characterized by developmental psychologists and philosophers of science) results in the experimental intermingling of instances of natural kinds with artifacts, adulterating the scenes and settings experimenters use to elicit responses to what they take to be "nature." It is easy to overlook artifactuality when studies using "nature" as an experimental condition fail to define what they mean by it. The result is testing of reactions to "fuzzy nature."

Earlier, this commentary alluded to "experience of nature" cognitive research having historically excluded recognition of findings from another branch of psychology, that concerned with *natural kind cognition*. The long-established view of the natural sciences and philosophers of science is that what composes nature is natural kinds. For philosophers of science, natural kinds are classes of phenomena unaltered by human beings—different sorts of rocks, behaviors of water, clouds, species of birds, species of fish and insects, maybe ecosystem types, and so on. Wild beaver in wild country constitute a natural kind; a particular beaver dam in wild country is an *instance* of a natural kind, or a *natural entity* (Katz 1993). During the 1980s, developmental psychologists and cognitive anthropologists conducted landmark research on the universality and fundamental role of natural kinds in human thinking (e.g., Keil 1989; Atran 1990; Carey and Gelman 1991; for a more recent review, see Gelman and Hirschfeld 1999: 403–446). As adopted by developmental psychologists, the concept of natural kinds explains deep tendencies in human understanding of the perceptual world; for instance, how young children acquire a nearly universal distinction between natural kinds and other classes of phenomena, such as artifacts and social entities. Significantly, just about all the phenomena that experimental psychologists have been presenting as the "nature" to which they expose their subjects are what the cognitive developmental scientists say are in fact either *artifacts* or instances of *mixed kinds*—potted plants, gardens, urban parks, grainfields, lawns, street trees, pets, and so on (Keil et al. 2007). In the extreme, experience of mixed kinds extends to altogether artificial environments: Franco et al. (2017) go so far as explicitly to include "nature simulations" as "nature."

The cost of omitting consideration of artifactuality in experience of nature research is failure to recognize the power of intentions embedded in artifacts and artificial scenes to distract from instances of genuine natural kinds—"nature" in the scientific sense—and the fact that external intentions obsess the human mind (see Malafouris 2016: 136ff.) If a subject is admiring a rock garden but dwells on the cost of buying nursery plants, he or she is not experiencing "nature" in any unadulterated sense, or even much in the way of natural entities, however "green" the leafy garden may be. Instances of wild living natural kinds (Katzian natural entities), on the other hand, will normally be understood as self-referential (e.g., Miller et al. 2019).

Where does cognitive processing of exposure to artifacts come from? Archaeologists such as Lambros Malafouris (2016) have convincingly argued that artifacts amount to cognitive prostheses—they embody purposes, intentions, and actions. People habitually try to infer what the underlying purposes, intentions, and plans of particular artifacts might be or may have been. This compulsion probably arose about 1.6 million years ago, with the making of Acheulean hand-axes by means of elaborate intentional flaking of stone (Malafouris 2016). As tool-making grew more complex and diversified over the millennia of human evolution, presumably the human mind kept up with the swelling variety and sophistication of equipment, deliberate acts, and coordinated behavior by becoming ever better at inferring what other people had in mind in producing them. Thomasello et al. (2005) provide a detailed theoretical argument that relates the understanding of intentions to cultural cognition generally. They say that understanding intentions emerges around a child's first birthday, and "material and symbolic artifacts of all kinds, including even complex social institutions, are in an important sense intentionally constituted" (p. 675).

In the 21st century, most people are constantly immersed in artifactuality, in their homes, on urban streets, in their work places, and even in rural countryside and parks, and many lines of investigation are now being pursued into how human beings exercise artifact cognition and understand artifacts and artifice (Margolis and Laurence 2007). Dennett's (1988) paradigm-shifting theory of "The Intentional Stance" has generated lines of "intentional hermeneutics" research relevant to the experience of "nature" insofar as intentions are embodied in or imputed to artifacts. In the decades since 1990, there has been a rapid development of philosophical, psychological, and cognitive research into the "Theory of Mind" generally. A central tenet of Theory of Mind research is that human beings are normally endowed with a powerful tendency, and ability, to attribute intention to other human beings and, at one remove, their products (Malle and Knobe 1997; Airenti 2018). According to Blakemore and Decety (2001: 563), "The medial prefrontal cortex is consistently activated by theory-of-mind tasks in which subjects think about their own or others' mental states," intentions pre-eminent among them. Attributions of intention are engaged in deciding how people react to artifacts they detect, even unconsciously, in their immediate environment (Steinbeis and Koelsch 2009).

Identifying the intentions lying behind artifacts and artificial activities can involve mental work (Kelemen and Carey 2007) and certainly it distracts a person from, for example, attending to natural kinds (e.g., Dustin et al. 2019; Skowronek et al. 2023). Park visitors whose attention is drawn to notices about prescribed burns, signs of trail grooming, garbage, and so on may find their minds turning to questions such as Who did this? Why did they do it? How should I react to it? (Needless to say, even when artifacts create a disjunction in the experience of a semi-natural setting, some of them may appropriately assist with navigation and safety.)

Nejade et al. (2022) suggest that what may produce the mental health benefits of "outdoor natural environments" is a reduction in rumination. Rumination, the continuous cycling of thoughts associated with negative mood (Papageorgiou and Wells 2003), has been found to be closely related to depression (e.g., Cooney et al. 2010). Ehring (2021) refers to converging evidence that "induced rumination leads to negative thinking, poor problem solving, inhibition of instrumental behavior, biased information processing, and impaired interpersonal functioning." Bratman et al. (2021) link rumination with negative (and, to a lesser extent, positive) affect and test the hypothesis that "nature contact" mediates the association. They asked subjects about engaging in interaction with "nature," naming the activities "walking outside, biking, gardening, playing games/sports, camping, fishing, reading outside, yard work, hanging out in a park," and administered a standard question-answer scale of brooding. With structural equation modeling, they find support for their hypothesis that the average amount of time a person spends in "nature" should reduce negative affect and heighten positive affect, and that it does so through lowering levels of rumination. Unfortunately, in their list of activities there seems to be no common element other than a subject's being out of doors, nor do the authors consider whether these activities might divert the mind from intentions.

Rumination is significantly and positively related to external locus of control, and people subject to feeling high levels of external locus of control also tend to suffer from depression (e.g., Mohammadi et al. 2013). Some of the many people suffering mental health problems collectively identified as "eco-anxiety" report that they react to artifactual evidence that human agency has produced environmental losses (Coffey et al. 2021). A few studies of ecological grief as a response to environmental loss (e.g., Cunsolo and Ellis 2018) note that human agency is behind climate change and global ecological degradation, the ultimate and ubiquitous artifacts in nature. For some persons, the experience of "nature" might well be a series of encounters with artifacts triggering thoughts and emotions associated with eco-anxiety, even in national parks. For instance, the sight of prescribed burning for purposes of ecological integrity might prompt unhappy rumination about human intervention as a cause of environmental degradation or the presumption of the remote experts who made the decision to burn.

III. HOW CAN "FUZZY" NATURE PRODUCE POSITIVE HEALTH EFFECTS?

In short, cognitive experimental research depending on the commonsense notion of "nature" has entered a minefield of imprecision, conflict with the "hard" sciences and philosophy of science, cultural assumptions masquerading as universals, and confusion between "nature" and mixed kinds. Yet lay subjects consistently behave as if they are reacting to something real in the conditions to which they are exposed. How is that fact to be explained?

Various theoretical explanations are available for how laypersons might react to semi-natural, semi-artificial landscape scenes as if they were examples of "nature." Four of them follow.

Cultural "nature." One possibility is that in Western and some major Eastern cultures, long literary and religious traditions, often expressed through student exposure to poetry in school and ever improving television programs, have resulted in laypersons thinking "Nature" is something concrete and perceptible, like water. In such fashion, entire populations have learned to recognize and enjoy what they take to be particular instances of the phenomenon in urban parks, gardens, and boulevards. The fact that what experimental subjects experience as "Nature" is predominantly composed of countless instances of mixed kinds and artifacts may not matter much if laypersons are unable to distinguish between natural and mixed-kind entities, for example a kind of tree native to an area versus an exotic planted, fertilized, watered, and pruned by municipal staff.

Because of the extensive and intensive growth of cities and large towns, globally there has been a widespread collapse of personal life lived next door to semi-wild settings (cf. Foo 2016). Transmission of high-resolution knowledge of natural kinds through family and childhood foraging for wild plants and animals (except fish, to some extent) has quickly wasted away as outdoor recreation afield has been displaced by team sports, games, and indoor electronic entertainment. As a consequence, it is typical for urban adults to possess almost no skill at discriminating among the biological kinds of the landscapes they inhabit (Medin and Atran 1999; Atran and Medin 2008), a state of ignorance rendering much human agency in semi-natural settings invisible to them. More narrowly, the university students typically used as subjects in experience of nature experiments may be especially naïve about natural kinds, partly because so many of them have grown up in large, dense cities to an extent far beyond what was the case in previous generations and partly because they have not lived long enough to learn much about what in local ecosystems is natural and what is artificial.

Additionally, the warm feelings laypersons—and researchers—have about the basic goodness of nature experience may now arise from any of the kinds of secular sacralization identified by Kirchhoff (2024), such as the scientific backing of conservation, idealization of ecosystem homeostasis, or nature as national heritage. For many park visitors, it may be no more compelling to distinguish between natural kinds and landscape artifacts than it is for churchgoers to care about which features inside their place of worship are consistent with their religion and which are not: for both mental frames, the experience is numinous and maybe nebulous. Kirchhoff hypothesizes that nature is predisposed to being sacralized because it can evoke acts of recognition going far deeper than concrete details.

Diffuse attention to natural kinds in fuzzy "nature." A second way of making sense out of the results from experience of nature studies is by supposing that when inexperienced modern subjects are exposed to scenes or landscapes including vegetation or water but thick with artifacts and heavy with artifice, they deploy what cognitive scientists call *diffuse attention* (Prettyman 2022). Diffuse attention takes in whatever is in the periphery of the visual focal point (vision being the preferred sense modality in studies of experience of nature; Velarde et al. 2007). Possibly for many modern experimental subjects, inexperienced and untutored in local natural history, the scene presented to them includes some instances of natural entities, altered by human beings or transplanted or not, so they interpret what they are seeing as vaguely a scene from “nature.”

Focal attention to natural entities in fuzzy nature. By contrast, the few individuals knowledgeable in lay natural history (Atran and Medin 2008) might use *focal attention*—the usual narrow beam of attention shifting from spot to spot in a scene—to fix on particular objects in the visual field and immediately discriminate between true natural entities, on one hand, and artifacts, mixed kinds, and artifice on the other, and they might dismiss the scene as not very natural at all. Indeed, they might react negatively to the presence of exotic invasives such as purple loosestrife (in eastern North America), management interventions such as planting selected tree stock in blocks, and so on. (For the relationship between knowledge and what is considered “natural,” see, for instance, McMahan et al. 2016.)

A third framework might take the theoretical construct of focal attention (Prettyman 2022) and turn the phenomenon just instanced on its head. Even subjects very ignorant of local fauna and flora might pick out true instances of natural kind phenomena, fix their attention on them, disregard everything patently artificial surrounding them in the scene, and consequently obtain fleeting relief from social rumination or refreshment from mental fatigue. For example, someone might be fascinated by the play of wind across a field of nearly ripe green barley; the barley and its field are artifactual through and through, but the wind instances behavior of a natural kind. Simple but strongly salient phenomena such as sunshine or clouds experienced overhead within an urban park may operate in this fashion.

Focal attention to things mistaken for instances of natural kinds. In an era when many persons living in urban environments have little or no fine-grained knowledge about the wild plants, animals, and fungi native to their home region, it is easy for them to mistake instances of hybrid kinds for natural kinds. Even biodiversity, sometimes taken as a surrogate for “nature” (Fuller et al. 2007), can be artificial from the perspective of biologists (Angermeier 1994). Many of the birds showing up at urban feeders are far from the original ranges of their species and are attracted by exotic foods. Naïve reactions to biodiversity of this sort may be modestly beneficial for health, but from a broader health perspective they are cognitive dead ends, since deeper knowledge about such phenomena can uncover massive human interventions, often regrettable. Positive reactions to examples of fuzzy nature might also undermine support for conservation, for which naturalness is becoming an imperative (Angermeier 2000).

These four explanatory frameworks might have quite different implications for making exposure to “nature” beneficial for mental health and wellness. If “*cultural nature*” or diffuse attention to natural entities is what is most at work in modern Western and Asian societies whose members are exposed to allegedly “natural” scenes, then the superficial engagement with amorphous “nature” is unlikely to afford more than brief or momentary relief from rumination about the maelstrom of intentions implicit in the artifacts and artifice challenging daily life. An urban park may be well supplied with growing plants and birdsong, but if visitors are unable to parse them into natural versus mixed kinds, what they think about after first exposure will likely not engage with knowledge about the evolved self-referential essence of the wholly natural entities. For this reason, presumably experience of unmixed natural kinds has greater mental health value than does experience of cultural nature or diffuse attention to natural entities.

Similarly, the gist of preceding paragraphs suggests that it is premature for medical doctors to prescribe doses of ill-defined “nature”—doses of an idea (Marx 2008)—in their treatment of poor mental health. Fuzzy “nature” may be so thick with artifacts and artifactual intentions that filling the prescription sometimes actually worsens mental health. If a physician prescribes a walk in a city park, it should be remembered that park design and the density of artifacts may interact with urban social conditions, or real knowledge of ecological degradation, to have negative effects on mental health (see Bhugra et al. 2019). (About medical practice based on “fuzzy” nature, see, for example, Jiminez et al. 2022, and the website for PaR$_X$, Park Prescriptions: https://www.parkprescriptions.ca/en/prescribers.)

IV. OVERALL IMPLICATIONS OF ARTIFACTS AND INTENTIONALITY FOR RESEARCH AND PRACTICE

Considered as a synthesized whole, cognitive research on the subjects discussed in this commentary—natural kind psychology, the intentional dimensions of artifacts, the mental health effects of rumination, and so on—could have implications for park and public health research and planning specifically. Parks are highly artificial entities, abounding in indications that somebody has aimed to achieve special effects on the land or in the city or in people. Many of these effects relate to how citizens or visitors experience being in a park. For example, signs displaying the message that one or another visitor activity is forbidden, if not accompanied by information about who has decided to forbid it and why, may provoke resentment of authority. There are no easy answers to the difficulties of managing visitor experience in parks, but at a minimum, the deliberations of those entrusted with planning and management would be more sensitive and sophisticated if they viewed their own actions as psychologically artifactual.

Park settings could be used to test hypotheses about how visitors experience artifactual intentions, how they perceive natural kinds in semi-natural landscapes, whether careful design might encourage visitors to perceive deliberate human interventions in supposedly natural ecosystems. Planning and cognitive health researchers might want to explore the results from designs dedicating portions of parks and greenspaces to exclosures within which natural processes flourish without human interference, especially if they feature native natural entities. Pairing such exclosures—small plots which park visitors could look into but from which they would be physically excluded—with designed and groomed plots adjacent to them might serve to enhance visitor discernment of natural versus mixed kinds. Conceivably, strengthening public ability to use focal attention when in semi-natural spaces could increase the value of such spaces for mental health purposes.

Although all artifacts are the product of human intentions, some artifacts appear to be more provocative of speculation about their maker's intentions than others (Sperber 2007). Whether differences in the richness of intentions implicit in different kinds of park or greenspace artifacts can have a major influence in the mental health effects of quasi-natural settings is a question of both theoretical and practical importance. Malt and Sloman (2007) offer many ideas about the categorization of artifacts.

Cross-disciplinary co-operation is needed between cognitive researchers and theorists in conservation biology, and studies inquiring into lay mental processes aroused by artifacts in semi-natural settings could be a bridge. Angermeier (2000) urges conservation biologists to adopt "the Natural Imperative," by which he means that "Naturalness provides an objective standard by which to judge the permissibility of ecosystem alteration and the appropriateness of conservation efforts" (p. 379). Angermeier argues that not just biologists but members of the public and indeed whole societies should respect and place high value on landscape naturalness. Insofar as parks are intentional landscapes, landscapes populated with artifacts and exhibiting artifice, park planners and managers would presumably like to have practical tools for measuring the intensity of artifice, and its inverse, the degree of naturalness, in places where they matter. Perhaps one such tool would be a protocol adapting the Line Transect Sampling procedure conventionally used by biologists to estimate populations of wild plants or animals in defined habitats (Anderson et al. 1979). To measure how artificial a landscape of interest is, researchers or managers might ask a sample of laypersons to walk along a line through a section of the landscape which is either representative or chosen randomly. (A walk, because a walk is frequently employed in studies intended to measure the effects of exposure to a "natural environment;" see Bowler et al. 2010.) Participants would then register the artifacts they notice and try to identify any associated intentions.

Finally, in view of the number and influence of psychological studies relating "nature" to health, perhaps the most serious consequence of growing researcher awareness of the role of artifacts and intention in "nature experience" might be its incorporation into the tradition of experiments based on two major theories going back to the early 1990s, Attention Restoration Theory (ART; Kaplan 1995) and Stress Reduction Theory (SRT; Ulrich et al. 1991). Thirty years after initial publication, these two theoretical frameworks continue to dominate in studies exploring "nature" experience (e.g., Mason et al. 2021). There is no necessary conflict between these frameworks and respect for the role artifacts and artifactuality play in the apperception of "nature," but studies within the ART and SRT traditions might proceed with greater precision and clarity if they did recognize the interaction between natural kinds and entities, on the one hand, and artifacts and artifactuality on the other, as factors in what they are testing.

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