

**Paradise Lost and Reclaimed:
An Existential Motives Analysis of Human-Nature Relations**

Sander L. Koole

Free University Amsterdam

Agnes E. Van den Berg

Alterra Green World Research, Wageningen

Draft: July 17, 2003

To appear in: J. Greenberg, S. L., Koole, and T. Pyszczynski (Eds.), Handbook of experimental
existential psychology. New York: Guilford.

RUNNING HEAD: Existential Motives and Human-Nature Relations

Paradise Lost and Reclaimed:

An Existential Motives Analysis of Human-Nature Relations

I was snorkling alone in the warm, sunny, clear waters of a tropical lagoon and experienced, as I often do in the water, a deep sense of pleasure and coziness. I felt at home. The warmth of the water, the beauty of the coral bottom, the sparkling silver minnows, the neon-bright coral fish, the regal angel fish, the fleshy anemone fingers, the esthetic pleasure of gliding and carving through the water, all in concert created an underwater elysium. And then, for reasons I have never understood, I had a sudden radical shift in perspective. I suddenly realized that none of my watery companions shared my cozy experience. The regal angel fish did not know that it was beautiful, the minnows that they sparkled, the coral fish that they were brilliant. Nor for that matter did the black needle urchins or the bottom débris (which I tried not to see) know of their ugliness. The at-homeness, the coziness, the smiling hour, the beauty, the beckoning, the comfort - none of these really existed. I had created the entire experience! (...) It was as though I peered through a rent in the curtain of daily reality to a more fundamental and deeply unsettling reality.

Irvin Yalom (1980, p. 219)

In his classic volume on existential psychotherapy, Yalom (1980) describes how he once had a deeply disturbing existential experience while he was on his own in a magnificent natural environment. At first glance, it may seem rather odd that the mere circumstance of being surrounded by great natural beauty could shake the very foundations of someone's existence. However, research in environmental psychology indicates that close encounters with nature quite commonly have this effect on people (Williams & Harvey, 2001). For instance, many participants of wilderness programs report that the confrontation with nature inspires feelings of awe, and leads to thoughts about spiritual meanings and eternal processes (Frederickson &

Anderson, 1999; Kaplan & Kaplan, 1989). Likewise, college students often report that visiting a natural setting causes them to reflect on themselves and their priorities in life (Korpela, Hartig, Kaiser, & Fuhrer, 2001). It thus appears that people's close encounters with nature are frequently accompanied by existential ruminations.

Is it by accident that so many people -like Yalom- feel driven to ponder the meanings of existence when they are confronted with nature? Or could there be something about nature itself that triggers these existential concerns? In the present chapter, we argue that people's interactions with nature are indeed closely associated with their most basic existential struggles. Human-nature relations thus provide a window on how people cope with matters of life and death. Conversely, a consideration of people's ultimate concerns may illuminate some of the deeper grounds of modern society's mounting conflicts with nature. In the next paragraphs, we start by tracing some of the historical roots between existential concerns and human-nature relations. Next, we introduce an existential-motivation analysis of human-nature relations, which portrays defense and growth as two fundamental motivational systems underlying people's responses to nature. We subsequently discuss some preliminary empirical applications of this dual-motive framework. Finally, we consider some of the broader implications of the present perspective for existential psychology and contemporary human-nature relations.

A Brief History of Human-Nature Relations

The study of human-nature relations presumes that human beings can be contrasted with other, presumably more natural life forms. Yet from a biological point of view, the similarities between humans and other species by far outnumber any differences. Other mammals, reptiles, insects, and even plants have the same basic needs for sustenance and reproduction, self-regulate their inner functions, and interact with the environment in ways that are fundamentally comparable to members of the human species. Indeed, genetic investigations have revealed that most human genes have an ancestry that goes back to even the earliest of animals and are held in

common with many other species (Freeman & Herron, 2001). Creatures as far removed from humans as the fruitfly or roundworm have genes whose DNA is recognizably similar to that of human beings. Chimpanzees, a primate species that branched off from the human species only five million years ago (a very short time period on the evolutionary time scale), have DNA that is on average 98 percent identical to human DNA (Gould, 1977).

Despite the great similarities between humans and other biological species, human beings seem unique in at least one respect: their unusually large cerebral cortex, which supports a sophisticated cognitive architecture. More than any other human trait, this cognitive architecture has contributed to the way in which the human race has managed to survive natural hardships and ultimately came to dominate the rest of the planet. The cognitive sophistication of the human mind has been responsible for the invention of ever more powerful technologies, which have afforded humans with a level of control over their environment that is unsurpassed by any other species. The human mind further supports self-awareness, or people's capacity to reflect on their own being. Self-awareness has many adaptive advantages, by enabling people to function as responsible and planful organisms (Pyszczynski, Greenberg, & Solomon, 1998; Silvia & Duval, 2001). However, self-awareness also forces people to confront their deepest fears about matters of life and death (Becker, 1962, 1973; Rank, 1936/1976; Yalom, 1980). The human mind is thus responsible for both the technological achievements and the deep psychological conflicts that characterize the human species.

Paradoxically, the human mind is itself the product of natural forces. Although the precise origins of the human mind remain shrouded in mystery, recent archeological findings have enabled researchers to reconstruct a general picture of how the human mind evolved (Sedikides & Skowronski, 1997, 2003). Between 2.5 and 3 million years ago, a general cooling of the climate and a decline in the availability of forested areas led early hominids to move from the forests towards savannahs, landscapes that contained a mix of grasslands and trees. This

change in habitat presumably led the hominids to adopt a different lifestyle, which included hunting for larger animals and living in larger groups. According to recent evolutionary analyses, this change in lifestyle created a new set of selection pressures that eventually led to the evolution of self-awareness (Sedikides & Skowronski, 1997). In particular, the hunting life style of the hominids favored the development of cognitive abilities to construct long-term plans, which included the sophisticated representational abilities to imagine one's current and future selves. In addition, group living favored the development of sophisticated perspective taking abilities and symbolic communication. In short, the change towards a savannah environment and the resulting changes in lifestyle gave rise to selection pressures that ultimately led to the evolution of human self-awareness.

Once the capacity for self-awareness had evolved, humans began to develop ever more sophisticated cultural practices (Leary & Cottrell, 1999). Indeed, a veritable "big bang of culture" seems to have occurred among *Homo sapiens* roughly 40,000 years ago (Mithen, 1996). Archeological excavations indicate that these late Paleolithic times were not only characterized by rapid technological developments of stone tools and weapons, but also the development of symbolic cultural practices. For instance, the Cro-Magnon people of Europe decorated their tools and sculpted small pieces of stone, bone, antler, and tusks. Necklaces, bracelets, and decorative pendants were made of bones, teeth, and shells. Moreover, the Cro-Magnons were able to make music (as indicated by findings of flutes and drums) and produced many cave paintings that contain naturalistic scenes of animals. For instance, the painting from the caves of Lascaux that is depicted in Figure 1 shows a man who is apparently attacked by a bison. Cave paintings of this kind suggest that the Cro-Magnon people were acutely aware of the natural dangers that surrounded them. Indeed, archeologists believe that Cro-Magnon cave paintings might have played an important function in magical or religious rituals that symbolically controlled the violent forces of nature. Cro-Magnons further had intentional burials which included grave

goods, suggesting that they had a culturally shared understanding of death and perhaps even notions of an afterlife. Taken together, this wealth of archeological evidence suggests that the self-aware Homo sapiens had developed symbolic behavior patterns that set him apart from the natural world.

Some 10.000 years ago, the first groups of people made the transition from hunting and gathering to settled agriculture (Harlan, 1995; Maryanski & Turner, 1995; Smith, 1995). At first, this transition occurred in just a few places. But within roughly 6000 years, most economies were based on settled agriculture. The reasons for this relatively rapid transition to settled agriculture are still poorly understood. Indeed, in some respects hunter-gatherer societies seemed better off than agricultural societies. For instance, relative to agricultural societies, hunter-gatherer societies spent less time and labor on food procurement, had better diets, lower rates of starvation, and fewer chronic diseases (Harlan, 1995). Possible explanations for the rise of settled agriculture include climatic changes, population growth, and cultural factors. Irrespective of its causes, the transition to agriculture dramatically changed people's relations with nature. The hunter-gatherer lifestyle required intimate knowledge of the locations, plant cycles, properties and uses of virtually all plants in their extended environment, as the average diet depended between 60 and 80% on plant foods (Harlan, 1995). By contrast, the agricultural lifestyle led people to settle permanently in a more limited amount of space, and to depend only on a few crops that were used for large-scale production. Agriculture also encouraged people to assume a greater amount of control over the natural world. Domestication of wild animals and plants, as well as the invention of other technologies yielded bigger harvests.

The transition towards agriculture gradually allowed more people to depend on less land. Freed from the land, people started living together in cities. Conceivably, the formation of larger communities was also stimulated by people's mounting concerns with death, given that larger communities seem better equipped to create shared meanings that can endow individuals with

symbolic immortality (Solomon, Greenberg, Schimel, Arndt, & Pyszczynski, in press). City dwellers were able to pursue occupations that were removed from immediate food production, in arts, religion, sciences, or technology. Human society thus developed into a complex pattern of ordered, differentiated relationships (Baumeister, in press). Within this complex societal organization, human traits such as rationality, personal responsibility, and planfulness were strongly cultivated (Martin, 1999; Woodburn, 1982). This rational emphasis went hand in hand with the accelerating development of science and technology. Awesome forces of nature such as electricity, atomic power, and DNA were subjugated and converted into powerful allies of human civilization. Indeed, modern civilization's interference with nature has become a growing cause of concern, creating problems such as depletion of the earth's energy resources, pollution, deforestation, accelerating rates of extinction of many species. Pure and untamed nature has become a scarce commodity, something that most people can only marvel at when it is displayed in zoos and nature documentaries. A sense of alienation from nature is felt among many members of modern society. Indeed, many individuals are willing to expend considerable time and resources to return to nature, through activities such as growing gardens or planning a trip to the outdoors.

Fear versus Growth:

An Existential Perspective on Human-Nature Relations

Clearly, humanity has come a long way since its pre-historic ancestors decided to move from the forests into the savannah. It seems tempting to conclude that ancient fears of nature have all but vanished from the minds of modern individuals. However, there may be more to people's relations with nature than meets the eye. As many existential thinkers recognized, nature is inherently associated with both life and death (Becker, 1973; Fromm, 1977; Jung, 1964; see also Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000). Accordingly, the confrontation with nature in a deeper sense still implies a confrontation with people's ultimate existential

concerns. In modern times, the most frightening aspects of nature are typically concealed, surfacing mainly during natural disasters such as earthquakes, floods, or epidemics. However, even on a more mundane level, nature remains a setting of stomach-turning cruelty and horror. Rotting corpses of animals by the road side, packs of rats in the sewers, swarms of cockroaches that plague apartment buildings; these are only a handful of the natural horrors that regularly take place even in the most urbanized environments. Despite human civilization's increased control over nature, it seems impossible to banish all such natural horrors for good.

The horrors of nature are further magnified by people's realization they themselves are part of the same cruel universe as all other natural phenomena. As Erich Fromm (1977, p.320) argued, "Self-awareness, reason, and imagination have disrupted the 'harmony' that characterizes animal existence. Their emergence has made man into an anomaly, the freak of the universe. He is part of nature, subject to her physical laws and unable to change them, yet he transcends nature; he is set apart while being a part; he is homeless, yet chained to the home he shares with all creatures". The uncanny realization of being "the freak of the universe" may be too much to handle for most people. As a consequence, people's existential concerns form a powerful drive to distance themselves from the savage reality of nature. This distancing may often occur quite literally, when people lock themselves away in cities. However, distancing from nature can also assume more symbolic forms. People may deny the physical, biological aspects of their being, for instance, by displaying disgust for body products or by suppressing their sexuality (Goldenberg and Roberts, this volume). Alternatively, people may render the relations with nature less problematic by controlling and cultivating the forces of nature. Symbolic distancing from nature can also be achieved through cultural means. Indeed, all known cultures have presented their members with idealized images of cultivated natural environments, such as the biblical Garden of Eden and the Arcadian pastoral landscapes of the ancient Greeks (Eisenberg, 1998). Such idealized images of nature convey the reassuring notion that the savage forces of

nature can be tamed, and may thus alleviate the existential anxiety that is aroused by the confrontation with nature (cf. Goldenberg et al., 2000).

Despite nature's association with deep existential fears, people's interactions with nature cannot be explained by defensive motives alone. To survive in a dynamic, ever-changing environment, people had to be at least somewhat open to new experiences, to explore new grounds and to develop new cognitive and behavioral skills. These needs for exploration and personal mastery can probably be realized to some extent in the civilized world. However, civilization is by definition pre-organized and constrained by artificial boundaries. Accordingly, people's exploration needs should form a powerful drive to seek out nature, especially nature in its wild and untamed varieties. Moreover, there may be deeper reasons why people cannot afford to avoid wilderness altogether. According to Jung (1964), the modern mind is built on ancient, primordial psychic structures. These age-old structures contain "archetypes", memories and instinctual urges that refer back to the experiences of our pre-human ancestors. Although the archetypes seemed strange and mystifying to many of Jung's contemporaries, recent advances in evolutionary psychology have rendered the notion of evolved psychological structures compatible with mainstream psychology (Kenrick, Sadall, & Keefe, 1998; Öhman & Mineka, 2000). Evolved psychological structures (or archetypes) are presumably part of the deep, preconscious parts of the brain. Therefore "rational" modern humans possess little conscious access to these structures. Yet, Jung (1964, p. 37) argued, "For the sake of mental stability and even physiological health, the unconscious and the conscious must be integrally connected and thus move on parallel lines. If they are split apart or 'dissociated', psychological disturbance follows". Thus, to function as whole persons, individuals should be prepared to overcome the artificial boundaries that civilization has placed between them and the natural world. From this perspective, the confrontation with nature may be indispensable for achieving personal growth and self-actualization.

To summarize, human-nature relations can be understood in terms of two conflicting existential motives. Close encounters with nature involve a confrontation with deeply rooted existential fears, which fuel defensive motives to distance oneself from or control the wild forces of nature. Nevertheless, nature also provides an ideal setting for exploration and personal growth. Because self-defense and growth each represent fundamental sources of human motivation (Deci & Ryan, 2000; Pyszczynski, Greenberg, & Goldenberg, 2003; Sedikides & Strube, 1997), it seems plausible that both types of motives are important determinants of people's responses to nature. Even so, self-defense may be the more basic system, in that defensive needs must be met before the growth/enrichment system may become activated. The primacy of defensive motives is based on the notion that, throughout evolutionary history, the costs of ignoring threats have outweighed the cost of ignoring opportunities for self-development (Baumeister, Bratslavski, Finkenauer, & Vohs, 2001; Taylor, 1991). Moreover, empirical investigations that have shown that growth motives are short-circuited when defensive pressures are brought to bear upon the individual (Deci & Ryan, 2000; Koole, Baumann, & Kazén, 2003; Mikulincer, 1997).

Empirical Evidence

Is there any evidence that is consistent with the existential motives analysis of human-nature relations? Within environmental psychology, there are indications that the confrontation with nature gives rise to ambivalent reactions. For instance, there are many reports of fearful reactions to wilderness environments among people who are unfamiliar with this type of environment (Kaplan & Kaplan, 1989). In a related vein, research has shown that modern urban youth commonly experience fear and discomfort when they are exposed to wilderness settings during mandatory school trips (Bixler & Floyd, 1997). On the other hand, as noted earlier, many people report that the confrontation with nature inspires feelings of awe, thoughts about deep spiritual meanings, and reflections on one's priorities in life (Kaplan & Kaplan, 1989; Korpela et

al., 2001). Accordingly, findings within environmental psychology support defense and growth as important motives in people's interactions with nature.

Our existential motives analysis assumes that the activation of self-defense and growth motives can vary substantially across situations and individuals (Koole & Van den Berg, 2003). In some situations and for some individuals, self-defense needs are likely to predominate. For instance, self-defense needs may be triggered by threatening or anxiety-arousing circumstances. Because of nature's inherent association with death, situations with trigger death concerns can be expected to be especially powerful elicitors of self-defense needs. Likewise, individuals who are chronically prone to experience high levels of threat or anxiety may be driven self-defense needs to a greater degree than low-anxious individuals. When self-defense needs predominate, people can be expected to respond highly defensively to nature, for instance, by psychologically distancing themselves from nature or by judging positively about cultivated environments. By contrast, in other situations and for other individuals, growth motives are more dominant. Relevant situations would involve circumstances under which individuals feel free to explore their surroundings by themselves in an unconstrained manner, especially circumstances that trigger curiosity and exploration needs. Likewise, individuals who are chronically inclined towards autonomous self-regulation can be expected to be driven primarily by growth needs (Deci & Ryan, 2000). When growth needs predominate, people can be expected to respond in an open, explorative manner to the natural world, for instance, by seeking out wild and untamed nature. In the following paragraphs, we will discuss some recent research that has tested these predictions.

Defense Motivation and Distancing from Nature.

The notion that defensive concerns motivate people to distance themselves from nature is closely in line with Terror Management Theory (TMT; Solomon, Greenberg, & Pyszczynski, this volume). According to TMT, concerns with death lead people to construct and validate a set

of cultural worldviews, which offer ways of achieving either literal or symbolic immortality. In support of this hypothesis, more than a hundred experiments to date have shown that death reminders leads people to defend their cultural worldviews more vigorously. In as far as culture is antithetical to nature, the worldview defense findings can be interpreted as a tendency to distance the self from nature in the face of death. In recent years, TMT research has addressed the existential aspects of human-nature relations more explicitly. In particular, Goldenberg and associates showed that death reminders cause people to respond more negatively to the physical aspects of sex (Goldenberg et al., 2000; Goldenberg & Roberts, this handbook). Goldenberg et al. (2001) reasoned that this tendency occurs because people feel a need to distance themselves from their mortal, animal nature when they have been primed with existential concerns. In line with this, death reminders caused greater aversion to the physical aspects of sex, especially after people have been primed with the similarities between humans and animals. Moreover, individuals who are reminded of death are especially likely to support beliefs that humans are distinct from animals and to report being disgusted by animals.

In parallel with the provocative research by Goldenberg and associates, we have recently started to explore the influence of existential concerns on people's relations with the natural environment. In this research, we have focused on people's responses to landscapes that varied in degree of cultivation, a well-studied landscape characteristic in environmental psychology (Van den Berg & Vlek, 1998; Van den Berg, Vlek, & Coeterier, 1998). Based on our conceptual analysis, we reasoned that wild natural environments should be more closely associated with thoughts about death than more cultivated environments. After all, cultivation imbues the natural environment with structure and order, which should affirm people's beliefs in a meaningful universe and render existential concerns less salient. In a first test of this notion, we asked a number of Dutch undergraduates ($N = 40$) to indicate in which kind of environment they thought most about various topics (Koole & Van den Berg, 2003, Study 1A). Embedded in a list of fairly

mundane topics like relation problems, politics, studies, we also included the topic of death. For each topic, participants were asked to indicate whether they thought most about these topics when they were visiting wilderness, cultivated nature, or the city. The results showed that more than 70% of our participants reported thinking most about death when they were in a wild natural environment. Notably, wilderness did not seem to trigger thoughts about any kind of topic, because subjects reported thinking most about politics or their studies when they were either in cultivated nature or the city. Moreover, the greater inclination to think about death in a wild natural environment did not seem to reflect a tendency to think about negative topics in general, because roughly equal numbers of participants reported thinking about relationship problems in either wild versus cultivated nature or the city.

The aforementioned study supports the hypothesized link between thoughts of death and exposure to wilderness. However, it is unclear from this study whether wilderness inspires thoughts about death, or whether thoughts about death lead people to seek out wilderness. Second, the study used an explicit, self-report methodology to assess this link. According to our theoretical analysis, the link between wilderness and death should also operate on more implicit levels. To clarify these issues, we conducted an additional study on the wilderness-death link (Koole & Van den Berg, 2003, Study 1B). More specifically, we primed different types of nature by exposing participants to color photographs of natural landscapes, which were rapidly flashed on a computer screen. For one half of the participants, the photos consisted of cultivated landscapes; the other half was primed with photos of wild landscapes. Immediately after the priming task, participants were asked to name the color of words that appeared on the center of the computer screen, an adaptation of the classic Stroop task. Some words in the Stroop task were related to death (e.g., corpse, grave). The remaining words were unrelated to death but negatively valenced (e.g., punishment, deceit), positively valenced (e.g., reward, love), or related to positive aspects of nature (e.g., flowers, birds). Within the Stroop task, heightened

accessibility of death thoughts was indicated by slower color naming latencies for death words relative to the color naming latencies of the other word categories. Based on our theoretical analysis, we predicted that the wilderness prime would lead to relatively faster color naming latencies of death words, whereas the cultivated prime would not show this effect. This pattern was indeed obtained. Thus, we were able to demonstrate that wilderness can prime thoughts about death, and that this link is even active on implicit levels.

Given that wilderness can trigger thoughts about death, terror management concerns seem highly relevant to understanding people's attitudes towards wilderness. In particular, salient terror management concerns may lead people to respond less favorably towards wilderness, which heightens people's concerns with death, and more favorably towards cultivated nature, because cultivated nature affirms people's beliefs in a controllable universe. To test these predictions, we examined the influence of terror management concerns on evaluations of wild vs. cultivated natural landscapes (Koole and Van den Berg, 2000). In particular, we manipulated mortality salience by asking participants two open-ended questions about either death or television (cf. Greenberg et al., 1997). Next, we had our participants evaluate descriptions of wild and cultivated Dutch natural landscapes, which were highly familiar to our Dutch sample. For instance, the wild landscapes included an impenetrable swamp forest and rough grasslands. The cultivated landscapes included landscapes such as green meadows and a grain field. Our expectation was that mortality salience would lead our participants to have a lower preference for wilderness. We also included a measure of individual differences in need for structure. Past research indicates that individuals with high need for structure have an especially pronounced inclination to rely on simple cognitive structures and cultural worldviews (Deschesne & Kruglanski, this volume; De Dreu, Koole, & Oldersma, 1999). Accordingly, we anticipated that need for structure would be negatively related to evaluations of wilderness.

As can be seen in Figure 2, both mortality salience and need for structure reliably predicted lower evaluations of wild natural landscapes (both p s $< .05$). By contrast, evaluations of cultivated natural landscapes were not reliably affected by these variables. It is further noteworthy that the effects of mortality salience and need for structure were additive. This pattern is consistent with the notion that mortality salience and need for structure relate to a single motivational system. In a follow-up study, we replicated the basic finding that mortality salience causes people to display more negative evaluations of wilderness (Koole & Van den Berg, 2003, Study 2). In this study, we also examined whether our findings were moderated by participants self-reported fear of death. Previous TMT research suggests the counter-intuitive notion that individuals with low expressed fear of death display stronger defensive reactions to mortality salience than individuals with high expressed fear of death (e.g., Harmon-Jones, Greenberg et al., 1995). Low expressed fear of death may thus reflect a tendency to deny one's existential fears, rather than a genuine absence of the fear of death. In line with this reasoning, we found that mortality salience produced stronger reductions in preference for wild over cultivated nature among participants with low expressed fear of death than among their counterparts with high expressed fear of death. Accordingly, these results suggest that defensive terror management processes indeed induce lower appreciation of wilderness.

To summarize, several lines of research have examined whether existential concerns can lead people to distance themselves from nature. First, TMT research indicates that mortality salience induces increased support of cultural worldviews (Greenberg et al., 1997) and negative reactions towards one's own biological functions and animals (Goldenberg et al., 2000). Second, Koole and Van den Berg (2003) found evidence that exposure to wilderness environments can trigger thoughts about death. Finally, recent experiments indicate that mortality salience and need for structure lead to less favorable evaluations of wilderness (Koole & Van den Berg, 2000,

2003). Taken together, there is initial support for the relevance of defensive terror management concerns to human-nature relations.

Growth Motivation and the Embracing of Nature.

The idea that people may respond to nature in a non-defensive, growth-oriented manner is broadly consistent with humanistic approaches to human motivation (Deci & Ryan, 2000; Kasser & Sheldon, this volume; Pyszczynski et al., 2003). In addition, many environmental scientists have argued that nature provides one of the most suitable contexts in which people can explore their own potential and engage in intrinsically motivated activities (e.g., Kaplan & Kaplan, 1989; Kellert, 1997). In line with this idea, Koole and Van den Berg (2003, Study 1A) found that most people think about freedom more often in wild environments than in either cultivated or in urban environments. Thus, wilderness is not only strongly associated with thoughts about death, but also with thoughts about freedom.

Some recent work in environmental psychology has further studied the relation between growth motivation and nature experiences. One line of research has shown that participants of wilderness programs and visitors of forests frequently report spiritual experiences (Frederickson & Anderson, 1999; Williams & Harvey, 2001). In a related vein, a recent series of interviews on nature experiences among 20 members of a nature organization in the Netherlands found that being in the woods is associated with inner peace, the experience of connectedness, and reflections on the cycle of life and death and one's own smallness in the grand scheme of things (Van Trigt, 2002). Although suggestive, the aforementioned investigations were qualitative, limited to one kind of nature, and conducted among pre-selected groups of nature enthusiasts. Accordingly, we deemed it desirable further investigate the connection between growth motivation and nature experiences.

In one preliminary investigation, we focused on growth motives that are associated with recreation activities (Van den Berg & Koole, 2003). Recreation is generally a self-initiated,

voluntary behavior that brings millions of modern people into close contact with nature. Accordingly, recreation seemed an ideal domain to explore the influence of growth motivation on nature evaluation. In our research, we built on Cohen's (1979) analysis of modern recreation experiences. According to Cohen, many recreation activities are primarily oriented towards the pursuit of brief, carefree pleasures (e.g., hanging in the bar with friends or exchanging jokes), the need to "re-charge one's batteries", or the desire to partake in a worldwide canon of attractions (e.g., visiting the Niagara waterfalls or seeing Dutch tulip fields). Cohen's analysis argues that these recreational orientations are primarily concerned with staged representations that only provide a reflection of reality. Cohen (1979) further distinguishes two recreational modes that are characterized by a deeper, more genuine search for alternative truths. First, the experimental mode is driven by a desire to find ultimate values that exist not within some other culture, but within oneself (e.g. "When I'm on vacation I like to be alone in the natural environment for hours on end"). Second, the existential mode is characterized by an embracing of newly discovered truths and alternative realities (e.g., "I am not satisfied with just seeing local cultures and their habits. I want to be part of it myself as much as possible").

In our study, we assessed recreational orientations using a validated Dutch instrument, the Modes of Experience Scale (MES; Elands & Lengkeek, 2000) among a randomly selected sample of Dutch city residents. After filling out the MES, participants were asked to rate six pairs of photographic simulations of wild and cultivated environments. Based on the notion that wild nature provides better opportunities for growth and exploration, we predicted that individuals whose recreational motives were growth-oriented (i.e., oriented towards the experimental or existential modes) would be more favorably disposed towards wild nature and less favorably disposed towards cultivated nature. Consistent with this, our results showed a highly reliable interaction between growth-oriented recreational modes and cultivation (see Figure 3). Growth-oriented participants rated wild environments as significantly more beautiful

than cultivated environments. By contrast, participants whose recreational modes were only weakly growth-oriented rated wild environments as less beautiful than cultivated environments. Recreational modes that were not growth-related (e.g., amusement, recharging batteries) were unrelated to nature evaluations.

After this initial study, we sought to extend our analysis to a more general level of personality functioning (Koole & Van den Berg, 2003, Study 3). Accordingly, another study focused on individual differences in action orientation, a volitional style that is characterized by self-determined, autonomous goal striving, particularly under stressful circumstances (Kuhl, 1994; Kuhl & Koole, this volume). Work on self-determination theory (Deci & Ryan, 2000) indicates that self-determination and autonomy are central elements of personal growth, so that action orientation seemed a valid indicator of the strength of the growth motivation system. Therefore, we predicted that participants high on action orientation would provide more favorable ratings of wild nature than participants low on action orientation. This prediction was confirmed across both participants' ratings of photographic simulations and their ratings of verbal descriptions of wild versus cultivated landscapes.

On The Dialectics between Growth and Defense

Taken together, there is preliminary evidence that both defense and growth motives exert a significant influence on people's responses to nature. Accordingly, the next question that arose was how defense and growth motives might interact. As we argued earlier, there are theoretical grounds to assume that defensive motives are primary. Negative experiences are generally more urgent than positive ones, because ignoring threats can potentially be lethal to the organism (Baumeister, Brastlavski, Finkenauer, & Vohs, 2001; Taylor, 1991). Furthermore, experimental evidence suggests that growth motives tend to become undermined under threatening circumstances (Deci & Ryan, 2000; Kasser & Sheldon, this volume; Koole et al., 2003).

We first examined the dialectics between defense and growth motives in a study that explored the effects of mortality salience on the nature evaluations of individuals with high or low growth motivation (Koole & Van den Berg, 2003, Study 4). In this study, participants started by filling out a questionnaire assessing individual differences in action orientation. Next, we manipulated mortality salience by means of a subliminal priming procedure (Arndt, Greenberg, Solomon, & Pyszczynski, 1999; see also Arndt, Cook, & Routledge, this volume). In the high mortality salience condition, participants were subliminally primed with the word "dood" (the Dutch word for death); in the low mortality salience condition, participants were subliminally primed with the four x-es. To assess whether our findings were specific to death priming, we also included a third condition which subliminally primed the word "pijn" (Dutch for pain). Subsequently, participants were asked to evaluate a series of high resolution color photos of wild versus uncultivated natural landscapes. We predicted that action-oriented participants would give higher beauty ratings to wilderness than state-oriented participants under conditions of low mortality salience or pain salience. This prediction was based on our presumption that action oriented individuals are more oriented towards growth and exploration. Under high mortality salience, however, we predicted that action-oriented individuals would become more similar to state-oriented individuals in giving lower ratings of wilderness. The results of the experiment supported these predictions. Moreover, the same basic pattern was replicated in two studies that used another indicator of growth/autonomy motivation, i.e., Burger's Desire for Control Scale (Burger, 1995; Van den Berg & Koole, 2002). Taken together, there is converging evidence that mortality salience eliminates the influence of growth motives on people's nature evaluations.

If defensive motives are primary, then how might growth motives come to influence people's responses to nature? Conceivably, growth motives only surface when people are fully convinced that their environment is free from any possible threat or harm. Although this is

plausible, these idyllic circumstances seem rather too rare and fleeting to account for all the circumstances under people's growth motives emerge. A second possibility is that there might exist some psychological mechanisms through which people are able to shield their growth motivation from becoming undermined by defensive concerns (Baumann & Kuhl, 2003; Koole, in press; Schimel et al., 2001). One suggestive line of research has shown that exposure to nature frequently has beneficial consequences for affective functioning and health (Ulrich, 1993). For instance, exposure to nature can provide relief from stress (Hartig, Mang, & Evans, 1991; Ulrich et al., 1991) and quicker recovery from surgery (Ulrich, 1984, 1986). These findings are relevant to the growth motive, because various theories have argued that the growth motives orient people's functioning in a manner that is highly conducive to psychological and physical health (Deci & Ryan, 2000; Kuhl, 2001; Jung, 1964). As such, the growth motivation system might mediate some of the restorative effects of nature.

Past studies on the restorative effects of nature typically included rather mundane stressors, such as a college examination (Ulrich, 1979), everyday stress (Hartig et al. 1991), or fear of going to the dentist (Heerwagen, 1990). It thus seemed important to know whether the restorative effects of nature might be effective in reducing the anxiety that is associated with people's ultimate concerns about death. To explore this issue, Van den Berg, Koole, & Van der Wulp (in press) examined nature's restorative effects on participants who had been exposed to gruesome reminders of death. More specifically, Van den Berg et al. first obtained baseline mood ratings from a group of participants and subsequently exposed them to scenes from "Faces of Death #1", a manipulation that has been successfully used in prior TMT research (Greenberg et al., 1990). The particular fragments shown included a farmer's wife decapitating a rooster and images of a slaughterhouse where sheep and bulls were killed in a very bloody fashion. After rating their moods for a second time, participants were exposed to another video fragment of a slowly paced walk through either a natural or an urban environment. Finally, participants rated

their moods for a third time. Our results showed that, as might be expected, participants had more negative moods immediately after watching Faces of Death. More importantly, however, participants who had subsequently watched a nature video showed significantly greater mood improvements than participants who had watched an urban video. It thus appears that the restorative effects of nature are powerful enough to extend to coping with death-related stressors.

At first glance, nature's ability to alleviate existential anxiety might seem at odds with our earlier findings that death reminders serve to reduce people's appreciation of nature. However, there are at least two ways in which these findings may be reconciled. First, our findings indicate that death reminders only lead to more negative evaluations of wild, uncultivated nature (Koole & Van den Berg, 2003). As such, our findings mesh well with other research showing that restorative effects of nature occur only for non-threatening nature (Ulrich, 1993). Extrapolating from these findings, we would expect natural scenery to alleviate existential anxiety only when the scenery is not perceived as highly uncontrollable and overwhelming. Second, our findings that death reminders can induce negative responses to wilderness have been obtained with rather subtle, cognitive death primes and on aesthetic judgments of nature, which presumably involve rather sophisticated cognitive processing. This paradigm is consistent with the bulk of TMT research, which has generally used subtle manipulations and dependent measures (Arndt et al., this volume). By contrast, our findings that natural scenery can alleviate existential anxiety were obtained using a highly arousing death prime. There are reasons to believe that this more blatant death priming evokes qualitatively different defensive responses from more subtle death primes (Arndt et al., this volume). The anxiety-buffering effects of nature were further obtained on mood ratings, which presumably are mediated primarily by affective processes that are less cognitively elaborated than beauty ratings. Taken together, it seems conceivable that anxiety-buffering effects of nature occur mainly for death reminders and

responses that are highly affectively charged, whereas defensive distancing from nature may occur most strongly for death reminders and responses that are more cognitively driven.

The possible dissociation between cognitive and affective defense systems in responding to nature fits with the TMT notion that defensive distancing from nature is motivated by people's cognitively driven concerns with the terrors of nature (Goldenberg et al., 2001). Indeed, most TMT research to date has found that verbal death reminders arouse little if any affective responses, while at the same time inducing highly reliable symbolic defenses (Arndt et al., this volume; Solomon et al., this volume). As such, the distinction between cognitive and affective defenses might generalize to people's terror management responses more generally. Although these speculations are intriguing, more research is required to understand how and when the confrontation with nature is anxiety-buffering versus anxiety-arousing, and how cognitive and affective defense systems are related to each other.

Summary and Conclusions

In the present chapter, we focused on some of the existential foundations of people's relations with nature. We began by examining human-nature relations from a historical perspective. As it turned out, people's capacity for self-awareness has been both a catalyst of existential concerns and people's growing alienation from nature. Accordingly, there seems to exist a fundamental link between existential psychology and human-nature relations. We then analyzed the core existential motives that may underlie people's ambivalence about nature. On the one hand, nature is inherently problematic for people because of its association with death and decay. Accordingly, people's defensive concerns with death provide a powerful motivation to distance themselves from the natural world. However, nature also provides an optimal setting for exploration and personal growth, both because nature is unconstrained by artificial boundaries and because the primal forces of nature are part of the deep structures of the human

psyche. Although people's defensive concerns are likely to be primary, our analysis concluded that defense and growth each exert a profound influence on people's interactions with nature.

After introducing our existential motives analysis of human-nature relations, we discussed some relevant empirical research. In line with the notion that the confrontation with nature can arouse existential concerns about death, research has shown that people often report fearful reactions to nature, particularly wilderness settings. Second, research within the TMT paradigm indicates that reminders of death lead people to intensify their identifications with their culture (indirectly implying a distancing from nature; Solomon et al., this volume), greater support of beliefs that humans are different from animals (Goldenberg et al., 2001), and more negative reactions to animals and things that remind people of their animal nature, such as sex (Goldenberg et al., 2000, 2002; Goldenberg & Roberts, this volume). Third, recent studies have shown that exposure to wilderness triggers thoughts about death (Koole & Van den Berg, 2003). Finally, reminders of death lead to more negative evaluations of wilderness, especially among individuals who deny their death anxiety. Taken together, there is consistent evidence that people's responses to nature are influenced by defensive existential concerns, which induce distancing oneself from nature.

Research has similarly supported the notion that people can respond to nature in a more positive, growth-oriented manner. More specifically, exposure to nature (as opposed to exposure to urban settings) often leads to restorative effects, i.e., reductions in stress, both experienced and on psycho-physiological levels, and even improved physical health (Hartig et al., 1991; Ulrich, 1993; Van den Berg et al., in press). Second, wilderness is associated with thoughts about freedom (Koole & Van den Berg, 2003). Finally, various indicators of growth motivation, such as growth-oriented recreational motives and action orientation, are positively associated with evaluations of wilderness (Koole & Van den Berg, 2003). Given that defensive and growth motives influence people's responses to nature in opposite ways, it becomes important to ask

how these motives interact. In this regard, research findings offer a mixed picture. Some recent studies have found that verbal reminders of death can serve to suppress the influence of autonomy-related growth motives (e.g., as indicated by individual differences in action orientation) on esthetic evaluations of wild vs. cultivated nature (Koole & Van den Berg, 2003). These findings suggest that defensive motives can override the influence of growth motives on people's evaluations of nature. However, another recent study showed that exposure to nature can reduce the negative affective impact of a highly vivid, emotional charged reminder of death (Van den Berg et al., in press). Accordingly, the interaction between growth and defense motives in human-nature relations seems complex and worthy of further study.

More generally speaking, the present analysis demonstrates how basic ideas in existential and motivation psychology have profound relevance to our understanding of human-nature relations. Although human-nature relations are traditionally considered beyond the realm of existential and motivation psychology, we believe that there is a vast potential for integration between these respective areas. The human species has lived in savage, uncultivated territories for the greater part of its evolutionary history (Appleton, 1975; Orians, 1980; Sedikides & Skowronski, 1997). It is therefore plausible that basic existential-motivational mechanisms evolved, at least originally, to cope with the risks and challenges of natural environments (Kaplan, 1987; Öhman & Mineka, 2001; Ulrich, 1993). The defense system, for instance, may have developed in conjunction with more primitive fear response systems such as the amygdalae (LeDoux, 1995), systems that originally evolved to cope with natural dangers such as insects and reptiles (Öhman & Mineka, 2000). In a related vein, some recent personality theories have proposed that the growth motivation system in part grew out of the spatial orienting system of the hippocampus (Kuhl, 2001; LeDoux, 2002). These and other connections between existential-motivational and environmental-psychological mechanisms may be exploited in future theorizing and research.

Finally, the present analysis could have some far-ranging practical implications for people's interactions with nature. If our analysis is correct, then some of the deeper roots of modern society's mounting environmental problems may lie in nature's association with ultimate concerns about death. The sharp conflict between nature and human civilization may thus be ultimately psychological, and as such seems unlikely to be solved by further scientific or technological developments. More than anything, then, humanity may need psychological wisdom to resolve its problematic relationship with nature. In the end, we may learn to acknowledge that we are part of nature as much as nature is part of us.

References

- Appleton, J. (1975). The experience of landscape. London: Wiley.
- Arndt, J., Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Subliminal exposure to death-related stimuli increases defense of the cultural worldview. Psychological Science, 8, 379-385.
- Becker, E. (1973). The denial of death. New York: Free Press.
- Baumeister, R. F. (in press). The cultural animal.
- Baumeister, R.F., Bratslavsky, E., Finkenauer, C., & Vohs, K.D. (in press). Bad is stronger than good. Review of General Psychology.
- Baumann, N., & Kuhl, J. (2003). Self-infiltration: Confusing assigned tasks and self-selected in memory. Personality and Social Psychology Bulletin, 29, 487-498.
- Becker, E. (1962). The birth and death of meaning. New York: Free Press.
- Becker, E. (1973). The denial of death. New York: Free Press.
- Bixler, R. D., & Floyd, M. F. (1997). Nature is scary, disgusting, and uncomfortable. Environment and Behavior, 29, 443-467.
- Burger, J. M. (1995). Need for control and self-esteem: Two routes to a high desire for control. In M. Kernis (Ed.), Efficacy, agency, and self-esteem (pp. 217-233). London: Plenum Press.
- Cohen, E. (1979). A phenomenology of tourist experiences. Journal of the British Sociological Association, 13, 179-201.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination perspective. Psychological Inquiry, 11, 227-268.
- De Dreu, C. K. W., Koole, S. L., & Oldersma, F. L. (1999). On the seizing and freezing of negotiator inferences: Need for closure moderates the use of heuristics in negotiation. Personality and Social Psychology Bulletin, 25, 348-362.

Eisenberg, E. (1998). The ecology of Eden: An inquiry into the dream of paradise and a new vision of our role in nature. New York: Random House.

Elands, B., & Lengkeek, J. (2000). Typical tourists: Research into the theoretical and methodological foundations of a typology of tourism and recreation experiences. Wageningen, The Netherlands: Mansholt Graduate School.

Frederickson, L. M., & Anderson, D. H. (1999). A qualitative exploration of the Wilderness experience as a source of spiritual inspiration. Journal of Environmental Psychology, 19, 21-39.

Freeman, S., & Herron, J. C. (2001). Evolutionary analysis. Prentice Hall.

Fromm, E. (1977) The anatomy of human destructiveness. Hradmondsworth: Penguin Books.

Goldenberg, J. L., Cox, C., Pyszczynski, T., Greenberg, J., & Solomon, S. (2002). Understanding human ambivalence about sex: The effects of stripping sex of its meaning. Journal of Sex Research, 39, 310-320.

Goldenberg, J., Pyszczynski, T., Greenberg, J., & Solomon, S. (2000). Fleeing the body: A terror management perspective on the problem of corporeality. Personality and Social Psychology Review, 4, 200-218.

Goldenberg, J., Pyszczynski, T., Greenberg, J., Solomon, Kluck, B., & Cornwell, R. (2001). I am *not* and animal: Mortality salience, disgust, and the denial of human creatureliness. Journal of Experimental Psychology: General, 130, 427-435.

Gould, S. J. (1977). Ontogeny and phylogeny. Cambridge: Belknap Press.

Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. In M. Zanna (Ed.), Advances in experimental social psychology (Vol. 29, pp. 61-139). London: Academic.

Greenberg, J., Solomon, S., Pyszczynski, T., Rosenblatt, A., Burling, J., Lyon, D., Simon, L., & Piel, E. (1992). Why do people need self-esteem? Converging evidence that self-esteem serves an anxiety-buffering function. Journal of Personality and Social Psychology, 63, 913-922.

Harlan, J. R. (1995). The living fields: Our agricultural heritage. New York: Cambridge University Press.

Harmon-Jones, E., Greenberg, J., Solomon, S., & Simon, L. (1996). The effects of mortality salience on intergroup bias between minimal groups. European Journal of Social Psychology, 26, 667-681.

Hartig, T., Mang, M., & Evans, G. W. (1991). Restorative effects of natural environment experiences. Environment and Behavior, 23, 3-26.

Heerwagen, J. H. (1990). The psychological aspects of windows and window design. In K. H. Anthony, J. Choi, & B. Orland (Eds.), Proceedings of the 21st annual conference of the Environmental Design Association. Oklahoma City: EDRA.

Jung, C. G. (1964). Man and his symbols. New York: Dell.

Kaplan, R., & Kaplan, S. (1989). The experience of nature: A psychological perspective. Cambridge: Cambridge University Press.

Kaplan, S. (1987). Aesthetics, affect and cognition: Environmental preference from an evolutionary perspective. Environment and Behavior, 19, 3-32.

Kellert, S.R. (1997). Kinship to mastery: Biophilia in human evolution and development. Washington, DC: Island Press.

Kenrick, D.T., Sadalla, E.K., & Keefe, R.C. (1998). Evolutionary cognitive psychology: The missing heart of modern cognitive science. Pp. 485-514 in C. Crawford & D. L. Krebs (Eds.) Handbook of Evolutionary Psychology. Hillsdale, NJ: Erlbaum.

Koole, S. L. (in press). Defending the self through willpower: Effects of action orientation and social demands on autonomy-related implicit self-evaluations. Social Cognition.

Koole, S. L., Baumann, N., & Kazén, M. (2003). When is it time to be true to your self? Effects of mortality salience and self-esteem on authenticity. Manuscript in preparation, Free University Amsterdam.

Koole, S. L., & Van den Berg, A. E. (2000). Effects of mortality salience and need for structure on evaluations of wild versus cultivated nature. Unpublished data set, Free University Amsterdam.

Koole, S. L., & Van den Berg, A. E. (2003). Lost in the wilderness: Terror management, growth motivation, and evaluations of nature. Manuscript submitted for publication, Free University Amsterdam.

Korpela, K., Hartig, T., Kaiser, F. G., & Fuhrer, U. (2001). Restorative experience and self-regulation in favorite places. Environment and Behavior, *33*, 572-589.

Kruglanski, A. W., & Webster, D. M. (1996). Motivated closing of the mind: "Seizing" and "freezing". Psychological Review, *103*, 263-283.

Kuhl, J. (1994). A theory of action and state orientations. In J. Kuhl & J. Beckmann (Eds.), Volition and personality: Action versus state orientation, (pp. 9-46). Göttingen: Hogrefe & Huber.

Kuhl, J. (2001). Motivation und Persönlichkeit: Interaktionen psychischer Systeme [Motivation and personality: Interactions between psychic systems]. Göttingen: Hogrefe.

LeDoux, J. E. (1995). Emotion: Clues from the brain. Annual Review of Psychology, *46*, 209-235.

LeDoux, J. E. (2002). Synaptic self: How our brains become who we are. London: MacMillan.

Leary, M. R. & Cottrell, C. A. (1999). Evolution of the self, the need to belong, and life in a delayed-return environment. Psychological Inquiry, *10*, 229-232..

Martin, L. L. (1999). I-D compensation theory: Some implications of trying to satisfy immediate-return needs in a delayed culture. Psychological Inquiry, *10*, 195-208.

Maryanski, A., & Turner, J. H. (1995). The social cage: Human nature and the evolution of society. Stanford, CA: Stanford University.

Mikulincer, M. (1997). Adult attachment style and information processing: Individual differences in curiosity and cognitive closure. Journal of Personality and Social Psychology, *72*, 1217-1230.

Mithen, S. (1996). The prehistory of the human mind. London: Thames & Hudson.

Öhman, A., & Mineka, S. (2000). Fears, phobias, and preparedness: Toward an evolved module of fear and learning. Psychological Review, *108*, 483-522.

Orians, G. H. (1980). Habitat selection: General theory and applications to human behavior. In: J. Nasar (Ed.), Environmental aesthetics: Theory, research, and applications (pp. 364-378). New York: Cambridge University Press.

Pyszczynski, T., Greenberg, J., & Goldenberg, J. L. (2003). Freedom versus fear: On the defense, growth, and expansion of the self. In M. R. Leary & J. P. Tangney (Eds.), Handbook of self and identity (pp. 314-343). New York: Guilford.

Rank, O. (1936/1976).

Schimmel, J., Arndt, J., Pyszczynski, T., & Greenberg, J. (2001). Being accepted for who we are: Evidence that social validation of the intrinsic self reduces general defensiveness. Journal of Personality and Social Psychology, *80*, 35-52.

Sedikides, C., & Skowronski, J. J. (1997). The symbolic self in evolutionary context. Personality and Social Psychology Review, *1*, 80-102.

Sedikides, C., & Strube, M. J. (1997). Self-evaluation: To thine own self be good, to thine own self be sure, to thine own self be true, to thine own self be better. In M. P. Zanna (Ed.),

Advances in Experimental Social Psychology (Vol. 29, pp. 209-269). New York: Academic Press.

Silvia, P. J., & Duval, T. S. (2001). Objective self-awareness: Recent progress and enduring problems. Personality and Social Psychology Review, 5, 230-241.

Smith, B.D. (1995). The Emergence of Agriculture. New York: Scientific American Library.

Solomon, S., Greenberg, J., Pyszczynski, T., Schimel, J., & Arndt, J. (in press). The critical role of terror and its management in the evolution of culture and the human mind. In M. Schaller & C. Crandall (Eds.). The psychological foundations of culture. New York): Erlbaum.

Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. Psychological Bulletin, 110, 67-85.

Ulrich, S.R. (1979). Visual landscapes and psychological well-being. Landscape Research, 4, 17-23.

Ulrich, S.R. (1984). View through a window may influence recovery from surgery. Science, 224, 420-421.

Ulrich, S.R. (1986). Human responses to vegetation and landscapes. Landscape and Urban Planning, 13, 29-44.

Ulrich, S.R. (1993). Biophilia, biophobia and natural landscapes. In: S.R. Kellert & E.O. Wilson, (Eds.). The biophilia hypothesis (pp. 73-137). Washington, DC: Island press.

Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. Journal of Environmental Psychology, 11, 201-230.

Van den Berg, A. E., & Koole, S. L. (2002). Desire for control and nature evaluation. Unpublished data, Alterra Green World Research, Wageningen.

Van den Berg, A. E., Koole, S. L., & Van der Wulp, N. (in press). Environmental preference and restoration: (How) Are they related? Journal of Environmental Psychology.

Van den Berg, A. E., & Vlek, C. A. J. (1998). The influence of planned-change context on the evaluation of natural landscapes. Landscape and Urban Planning, 43, 1-10.

Van den Berg, A. E., Vlek, C. A. J., & Coeterier, J. F. (1998). Group differences in the aesthetic evaluation of nature development plans: A multilevel approach. Journal of Environmental Psychology, 18, 141-157.

Van Trigt, A. A. (2002). Hogere sferen. Belevingsonderzoek naar de spirituele waarde van bomen en bos.[Higher grounds. An investigation into the experience of the spiritual value of trees and forests] Unpublished Master's thesis, Wageningen University, Wageningen, the Netherlands.

Williams, K. D., & Harvey, (2001). Transcendent experience in forest environments. Journal of Environmental Psychology, 96, 18-23.

Woodburn, J. C. (1982). Egalitarian societies. Man, 17, 431-451.

Yalom, I. (1980). Existential psychotherapy. New York: Basic Books.

Figure 2: Effects of Mortality Salience (MS) and Need for Structure (NFS) on Perceived Beauty of Wild Natural Landscapes (1= not at all beautiful, 11 = very beautiful) (Koole & van den Berg, 2000).

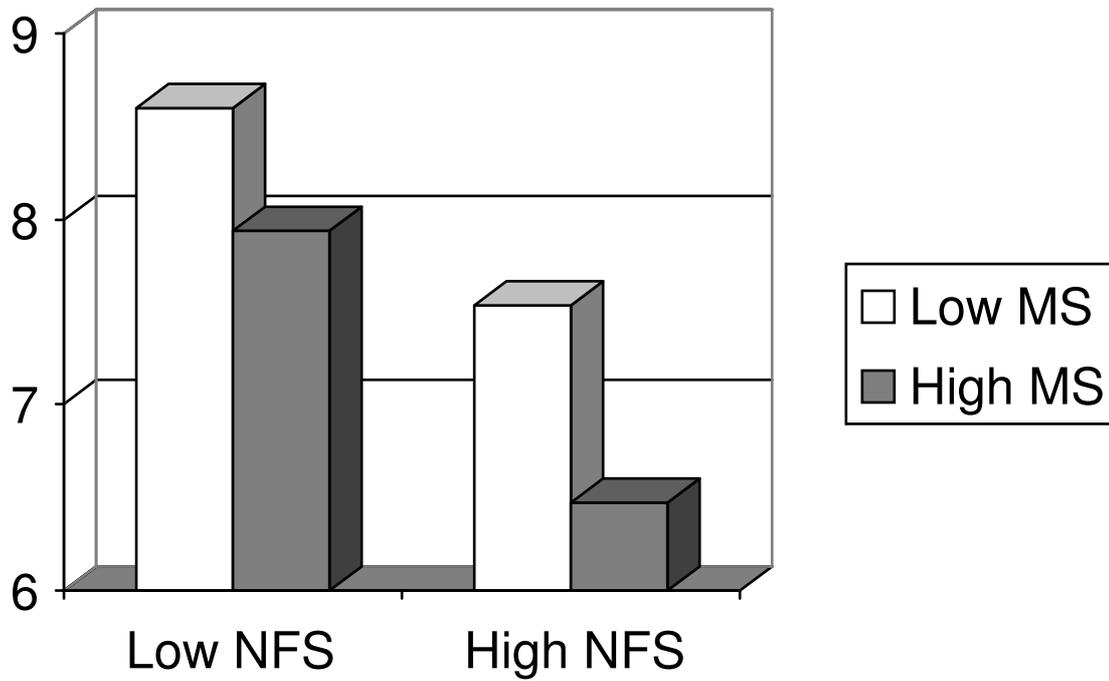


Figure 3: Effects of Growth Oriented Recreation Motives (GORM) on Perceived Beauty for Cultivated Landscapes (Van den Berg & Koole, 2003).

