

Empathizing With Nature: The Effects of Perspective Taking on Concern for Environmental Issues

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In this article, I propose that concern for environmental problems is fundamentally linked to the degree to which people view themselves as part of the natural environment. Two studies are reported that test aspects of this theory. The first study describes the structure of people's concern for environmental problems. Results from a confirmatory factor analysis showed a clear three-factor structure, which I labeled egoistic, altruistic, and biospheric. A second study examined the effects of a perspective-taking manipulation on egoistic, social-altruistic, and biospheric environmental concerns. Results showed that participants instructed to take the perspective of an animal being harmed by pollution scored significantly higher in biospheric environmental concerns than participants instructed to remain objective.

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In more than 30 years of psychological research, a variety of social psycho- logical theories have been applied to explain attitudes about environmental issues and proenvironmental behavior. One source for theories is social psychological research on prosocial behavior. In this article, I draw on recent theoretical research on altruism and empathy to sketch the beginnings of a broad social-cognitive theory for environmental concern. I argue that the types of environmental concerns people develop are associated with the degree to which they view themselves as interconnected with nature. Data from two studies provide evidence that (1) environmental concerns are clustered into three types and (2) taking the perspective of animals being harmed by pollution produces significantly higher levels of concern for the welfare of plants and animals than remaining objective.

In a preceding issue of the *Journal of Social Issues*, Stern and Dietz (1994) proposed that attitudes of environmental concern are rooted in a person's value system (see also Stern, Dietz, & Kalof, 1993, or Stern, Dietz, Kalof, & Guagnano, 1995). They argued that people's attitudes about environmental issues are based on the value that they place on themselves, other people, or plants and animals. Each of these clusters of values provides a distinct basis for environmental concern, such that two people could express the same level of general concern (e.g., concern for air pollution) for fundamentally different reasons (e.g., polluted air is dangerous to my health, polluted air is dangerous to the health of children, or polluted air is dam- aging to forests). They refer to this model as the value-belief-norm (VBN) theory (see Stern, this issue).

Stern and Dietz (1994) termed these three value-based environmental concerns egoistic, social-altruistic, and biospheric. Egoistic concerns are based on a person's valuing himself or herself above other people and above other living things. "Egoistic values predispose people to protect aspects of the environment that affect them personally, or to oppose protection of the environment if the personal costs are perceived as high" (Stern & Dietz, 1994, p. 70). Although egoistic values are often seen as opposing the environmental movement (Clark, 1995; Oskamp, this issue), it is important to point out that in situations where people high in egoism perceive a threat to themselves from environmental damage, they can be expected to be concerned about environmental problems. Social-altruistic values lead to concern for environmental issues when a person judges environmental issues on the basis of costs to

or benefits for other people, be they individuals, a neighborhood, a social network, a country, or all humanity. Biospheric environmental concerns are based on a value for all living things.

A large body of research has linked environmental problems to the human tendency to act in one's own interest (e.g., Bamberg, Kuhnel, & Schmidt, 1999; Diekmann & Preisendorfer, 1998; Hardin, 1968, 1977; Kaiser, Ranney, Hartig, & Bowler, 1999). For example, driving a car a few blocks to the store is beneficial for the individual (e.g., it's faster, requires less physical exertion, and is climate controlled) but is detrimental to the collective (contributes to traffic congestion and noise, uses more natural resources) and detrimental to the environment (air pollution). According to this rational-choice model, environmental behavior is motivated by the perceived behavioral consequences associated with various actions. As Batson (1994) points out, however, at times, people do act in ways that increase the welfare of some other person or group of people over self. Indeed, we would expect the rational-choice model to explain more variability in behavior for individuals who place a higher value on self (relative to their valuing of others and of nature) than for individuals who place less relative value on self. Based on the VBN theory summarized above, we would expect the rational-choice model to apply more to egoists than to social-altruists or biospherists.

An argument similar to that made by Stern and Dietz (1994) can be found in Batson (1994) and Batson, Batson, et al. (1995), although Batson does not draw connections between his work and proenvironmental attitudes or behaviors. Expanding on his research concerning empathy and altruism (cf. Batson et al., 1988; Batson et al., 1989; Batson et al., 1991), Batson (1994) points out that at times, people choose to act in the interest of others, even when that action comes at a cost to self. Batson argues that prosocial behavior can be motivated by four different factors: egoism, collectivism, altruism, and principlism. Motives are defined as forces aimed at achieving an ultimate goal, and it is individual differences in these ultimate goals that lead to different motives. These ultimate goals are comparable to Stern and Dietz's (1994) value orientations. For Batson (1994), egoism is a self-interest motive: "a motive is egoistic if the ultimate goal is to increase the actor's own welfare" (p. 604). Choosing to drive a car to a nearby store because it is easier is egoistic. (Similarly, choosing not to drive in order to save money is also egoistic.) Collectivism is a motivation with the ultimate goal of

increasing the welfare of a group of people or collective. Altruism is motivation with the ultimate goal of increasing the welfare of “one or more individuals other than oneself” (p. 606). For example, choosing not to drive in order to reduce traffic congestion is altruistic. Finally, principlism is motivation with the ultimate goal of upholding some moral principle. Choosing not to drive in order to improve the quality of life for all living things shows principlism.

The present research builds on the theories of both Stern and Dietz (1994) and Batson and his colleagues (Batson, 1994; Batson, Batson, et al., 1995). Both theories suggest that environmental concerns (which may also serve as motives for behavior) may be clustered around common themes. Following Stern and Dietz (1994), I propose that there are sets of valued objects that are directly linked with environmental concerns. These concerns are based on the negative consequences that could result for valued objects, and these valued objects can be classified as self, other people, or other living things. I refer to these concerns as egoistic, altruistic, and biospheric. Note that I am avoiding the “isms” (e.g., biospherism), because this implies a broad worldview rather than specific attitudes of concern.

I do not assume that these concerns are independent from one another. Instead, I propose that objects are valued because of their perceived relation to self and that egoistic, altruistic, and biospheric concerns reflect varying levels of the inclusiveness of an individual’s notion of self (Schultz, 2000). That is, the types of concern for environmental problems that an individual holds are fundamentally linked to the degree to which he or she includes other people and nature within his or her cognitive representations of self. Although a variation of this position was suggested in Dunlap and Van Liere’s (1978) more sociological New Environmental Paradigm theory, the theoretical linkages between this notion and current research on environmental concern have not been made. Such a conceptualization offers a broad perspective that could potentially integrate some of the existing research on environmental attitudes and behaviors.

I propose that environmental concern is tied to a person’s notion of self and the degree to which people define themselves as independent, interdependent with other people, or interdependent with all living things. From this perspective, concern for environmental issues is an extension of the interconnectedness

between two people (Bragg, 1996; Weigert, 1997). We can be interconnected with other people, or more generally, we can be interconnected with all living things. Indeed, the nonscientific literature is replete with references to being “in touch with,” “connected with,” or “at one with” nature (Hertsgaard, 1999; Nabhan & Trimble, 1994), and stories reflecting an individual’s relationship with aspects of the natural world are common across many cultures (cf. Elder & Wong, 1994). People who define themselves as relatively independent from other people and from the natural environment are egoists. They do not view themselves as interconnected with other people or with the natural environment, and so for them, concern for environmental issues will be motivated by reward for the self or the avoidance of harmful consequences (i.e., the rational-choice model prevails). In contrast, environmental concern among people who view themselves as interconnected with others will be based on a desire to gain rewards for people (both specific individuals and people in general) or to avoid harmful consequence for other people. Finally, environmental concern among people who define themselves as part of the biosphere will be based on a desire to gain rewards for all living things or to avoid harmful consequences for the biosphere.

I am not suggesting that individuals with biospheric attitudes are more concerned about environmental problems or that people with egoistic attitudes are unconcerned or apathetic. Indeed, both types of concerns may be predictive of attitudes toward a specific issue, but each has a different foundation. It does seem likely, however, that biospheric concerns provide a broader motive for behavior. For example, we would expect egoistic concerns to be positively predictive of attitudes about specific local issues that directly impact self. In contrast, we would predict that biospheric concerns would be positively related to attitudes about global, more abstract environmental issues, as well as to more specific issues. Thus, we would not be surprised to find people with egoistic and biospheric concerns side by side at a local meeting for the zoning of a landfill. Yet we would not expect people with egoistic concerns to attend a protest to reduce global warming (we would expect to see people with biospheric concerns at such an event).

Based on the social-cognitive theoretical framework sketched above, two studies were conducted. The first study was actually a set of studies designed to test the three-factor model of environmental

concern. The second study examined the activation of these concerns by producing an empathic response to different valued objects. Research on prosocial motivation has clearly shown that empathy is a strong predictor of helping behavior. Empathy can be defined as “an other-oriented emotional response congruent with the perceived welfare of another individual” (Batson, Batson, et al., 1995). Extending Batson’s empathy-altruism theory to the study of environmental issues, it follows that inducing empathy for the natural environment should lead to the activation of biospheric environmental concerns. The most widely used technique for inducing empathy is perspective taking. Perspective taking is the vicarious experience of another; it is an attempt to understand another person by imagining the other’s perspective (Batson, Batson, et al., 1995). Research on perspective taking generally supports the view that “instructions to imagine the affective state of a target frequently trigger a process which ends in the offering of help to that target” (Davis, 1996, p. 145).

Study 1

To assess the clusters of environmental concerns, I identified and tested the factor structure of the valued objects about which people express concern.

Item Development

To identify valued objects, open-ended responses from a recent multinational study were coded (Schultz & Zelezny, 1998). Participants were college students from the United States ($n = 345$), Mexico ($n = 187$), Nicaragua ($n = 78$), Peru ($n = 160$), and Spain ($n = 187$). Participants were asked to complete a four-page questionnaire that contained several established measures of environmental attitudes. As the last item in the questionnaire, participants were asked, “What is the environmental problem that concerns you the most and why?” Respondents were provided with three quarters of a page on which to write their response to this question.

Each open-ended response was coded by a bilingual translator. Responses were coded for (1) the environmental problem listed by the respondent, (2) the object that was harmed by the problem, and (3) the “why” aspect of the response

—egoistic, altruistic, or biospheric. The coded responses were then sorted into the three categories, and the seven most often-mentioned valued objects were selected from each of the three value-based groups. The items were then modified so that they were simple and generic enough to be answered by most respondents.

These initial 21 items were administered to a new sample of 245 U.S. undergraduates. Participants were asked to rate each item on a scale from 1 to 7. The introduction stated:

People around the world are generally concerned about environmental problems because of the consequences that result from harming nature. However, people differ in the consequences that concern them the most. Please rate the following items from 1 (not important) to 7 (supreme importance) in response to the question: I am concerned about environmental problems because of the consequences for__.

Responses to the 21 items were factor-analyzed using a principal components extraction procedure with a direct oblimin oblique rotation. Through a series of exploratory factor analyses, 12 items

(four each from egoistic, altruistic, and biospheric) that generated a clear three-factor structure were identified. Selection of these 12 items was based on factor loadings, commonalities, zero-order correlation coefficients, and theoretical grounds.

The 12 items were then factor-analyzed a second time and rotated using a direct oblimin procedure. Three factors with eigenvalues greater than 1.0 were extracted that accounted for 74% of the total variance. Factor loadings for the three extracted factors are presented in Table 1. The first factor represents a biospheric factor, and the items with strong factor loadings were “marine life,” “birds,” “animals,” and “plants.” The second factor represents an egoistic factor; the variables with strong factor loadings were “my health,” “my future,” “my lifestyle,” and “me.” The third factor was labeled altruistic, and it was defined by “children,” “people in my community,” “all people,” and “my children.” Correlations between the three factors were $r = .25$ for egoistic and biospheric, $r = .37$ for biocentric and altruistic, and $r = .39$ for egoistic and altruistic. To further examine my proposed three-factor model, a confirmatory factor analysis (CFA) was performed with a new sample.

Confirmatory Factor Analysis

Sample. Participants in the study were 400 psychology undergraduates from the United States. Participants rated the 12 environmental items identified above.

Statistical analysis. A CFA was performed using AMOS 3.6. Missing values were replaced with series means.

Table 1. Egoistic, Social-Altruistic, and Biospheric Scale Items and Rotated Factor Loadings Rotated factor loadings^a

Scale and item	Factor 1	Factor 2	Factor 3
Biospheric concerns			
Animals	.22	.90	.36
Plants	.27	.85	.29
Marine life	.21	.93	.35
Birds	.26	.93	.44
Egoistic concerns			
Me	.89	.18	.44
My future	.83	.24	.40
My lifestyle	.78	.12	.24
My health	.80	.39	.30
Altruistic concerns			
All people	.31	.33	.75
Children	.23	.37	.76
People in my community	.38	.30	.90
My children	.41	.28	.93

^aAn oblimin rotation was used. Factor loadings shown are from the rotated matrix.

Results. The CFA tested three possible models: a one-factor, a two-factor, and a three-factor model. The one-factor model is consistent with the view of environmental concern as a unidimensional construct ranging from *unconcerned* at the low end, to *concerned* at the high end. This is the implicit model adopted in much of the research on attitudes of environmental concern. To test the one-factor model, all 12 environmental items were loaded on a single factor. The two-factor model is consistent with the classification of environmental attitudes as rooted either in a concern for all living things or in a concern for humans (self included; cf. Thompson & Barton, 1994). To test this model, the four biospheric concerns were loaded on one factor, and the remaining eight items (four egoistic and four social- altruistic) were loaded on a second factor. The three-factor model is consistent with Stern and Dietz's (1994) tripartite conceptualization of environmental concerns grounded in clusters of valued objects. I expected the three-factor model to provide the best overall fit to the data.

Results are based on maximum likelihood estimates produced from covariance matrices. Analyses indicated that the independence model could be rejected ($df = 66$, $\chi^2 = 2200.28$, $\chi^2/df = 33.37$, root mean-square error of approximation [RMSEA] = .29, goodness-of-fit index [GFI] = .38, adjusted GFI [AGFI] = .26, Tucker-Lewis index [TLI] = .00). The one-factor model showed an improved, but still unacceptable fit ($df = 54$, $\chi^2 = 821.69$, $\chi^2/df = 15.22$, RMSEA = .19, GFI = .68, AGFI = .54, TLI = .56). The two-factor model was significantly better, $\chi^2(1) = 406.47$, $p < .001$, than the one-factor model ($df = 53$, $\chi^2 = 415.22$, $\chi^2/df = 7.83$, RMSEA = .13, GFI = .83, AGFI = .75, TLI = .80), but did not provide an acceptable fit—all of the fit indices were beyond my established limits. The three-factor model showed a significant, $\chi^2(2) = 196.74$, $p < .001$, improvement over the two-factor model and provided an overall acceptable fit ($df = 51$, $\chi^2 = 218.48$, $\chi^2/df = 4.28$, RMSEA = .08, GFI = .92, AGFI = .90, TLI = .90). The unstandardized factor weights, standardized factor weights (shown in parentheses), covariances between the three factors, and correlation coefficients between the three factors (shown in parentheses) are presented in Figure 1.

Study 2

The results from Study 1 showed support for the distinction between egoistic, altruistic, and biospheric attitudes of environmental concern. The second study was an experimental attempt to activate different environmental concerns using a perspective-taking manipulation. I have argued that the types of concerns an individual has for environmental problems are associated with the degree to which the individual includes nature within his or her cognitive representations of self. Based on this perspective, I predicted that taking the perspective of another person or an animal would lead to a greater inclusiveness and subsequently, greater levels of biospheric environmental concern.

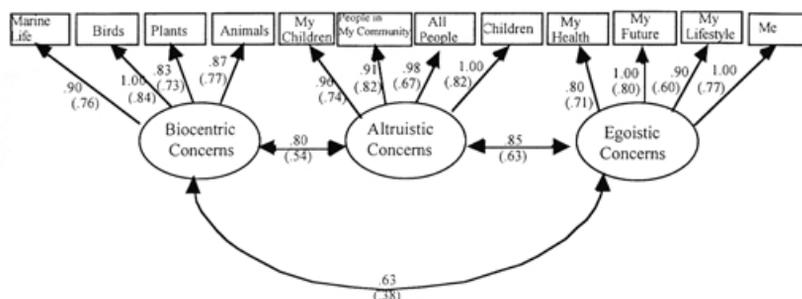


Fig. 1. Results from a confirmatory factor analysis of the three-factor structure

Methodology

Sample. Participants in the study were 180 undergraduates recruited from the psychology department's human participant pool.

Materials. Participants were randomly assigned to view one of three sets of pictures: people engaging in recreational activities in a natural environment (a woman meditating on the beach, a hiker in a forest, a painter near a lake, a rock climber, a person canoeing), animals in a natural environment (a caribou on a hill, gorillas in a forest, a bear, a rhinoceros on a savanna, a breaching whale), or animals being harmed by nature (a seal caught in a fishing net, an eagle on a smoky factory smokestack, an otter in an oil spill, a bear in a trash pile, a bird with a plastic bag around its neck). Color images were shown on a 15" SVGA color monitor in 8-bit color using Microsoft PowerPoint 4.0. Each image appeared on the screen for 30 s; participants viewed a total of five slides.

After viewing the slides, participants completed a questionnaire that contained several measures of environmental attitudes, including the 12 environmental concern items identified above. Separate scale scores were produced for egoistic, altruistic, and biospheric concerns by averaging the four items in each domain. Alpha reliabilities for the three subscales were all high: egoistic ($\alpha = .91$), altruistic ($\alpha = .92$), and biospheric ($\alpha = .94$).

Procedure. The study was conducted in a small laboratory

room. Upon arrival, participants provided informed consent and were given written instructions that were read aloud by the experimenter. Half of the participants were randomly assigned to an “objective” condition. Instructions read:

As you view the images, look closely at the subjects within each image. Make careful observations about the subjects’ mannerisms, postures, movements, and facial expressions. Notice exactly what the subject is doing, whatever it is. Try to take a neutral perspective, being as objective as possible about the subjects. Do not concern yourself with feelings or views. Do not let yourself become caught up in imagining what the subject has been through. Just concentrate on the images objectively.

The other half of the participants were assigned to a “perspective-taking” condition. Instructions read:

As you view the images, try to imagine how the subjects in the images feel. Try to take the perspective of the subjects, imagining how they are feeling about what is happening. While you view the images, picture to yourself just how they feel. Think about their reactions. In your mind’s eye visualize clearly and vividly how they feel in their situation. Try not to concern yourself with attending to all the information presented. Just imagine how the subjects feel in their situation.

After participants indicated that they understood the instructions, the lights were dimmed and the slide show began. The first slide informed the participants about the types of slides they would see.

As part of the post session questionnaire, participants completed four manipulation check items: To what extent did you try to imagine how the subjects were feeling? To what extent did you objectively observe the subjects in the images? To what extent did you take the perspective of the subjects in the images? To what extent did you remain detached from the subjects in the images? Items were rated on a 5-point scale from 1 (*not at all*) to 5 (*all of the time*).

Results

This was a 2 X 3 factorial experiment with 30 participants in each cell. Preliminary analyses examined the scores on the four

manipulation check items. Four 2 X 3 analyses of variance (ANOVAs) were performed: one for each manipulation check item. Across all four analyses, the results showed a significant main effect for perspective taking, no main effect for picture type, and no interaction. Univariate tests revealed significant differences in the expected direction for three of the four manipulation check items (eta-squared = .54, .36, and .21 for items 1, 3, and 4, respectively). For the second item, “To what extent did you objectively observe the subjects in the images?” the results showed a nonsignificant difference between the perspective-taking ($M = 4.01$) and the objective ($M = 4.02$) condition, $F(1, 174) = .01, p = .93$, eta-squared = .00. I attribute this to awkward wording of the item; participants in the perspective condition may have interpreted “objectively observe” to mean “look carefully” and subsequently indicated that they did.

Responses to the 12 environmental-concern items were analyzed using a 2 (perspective, objective) X 3 (picture type) multivariate analysis of variance (MANOVA), with egoistic, altruistic, and biospheric concerns as the dependent variables. The results revealed a significant multivariate picture type by perspective-taking interaction, $F(6, 346) = 2.77, p = .01$, Pillais = .09. Neither the main effect for picture type, $F(6, 346) = 1.65, p = .13$, nor the main effect of perspective taking, $F(3, 172) = .53, p = .66$, was significant. Follow-up 2 X 3 univariate tests for each of the three dependent variables revealed a significant interaction for biospheric ($F = 4.44, p = .013$) and for altruistic ($F = 5.95, p = .003$) concerns, but not for egoistic concerns ($F = 1.33, p = .27$).

For biospheric concerns, the interaction showed that when the picture was an animal being harmed by pollution, participants in the perspective-taking condition scored significantly higher ($M = 5.82$) than participants in the objective condition ($M = 5.01$), $F(1, 178) = 5.34, p = .02$. No significant differences were observed between the perspective-taking and objective conditions when the image was an animal in nature, $F(1, 178) = .01, ns$. A marginally significant difference was observed when the image was a person in nature, $F(1, 178) = 3.54, p = .06$, with the perspective-taking condition scoring lower ($M = 4.93$) than the objective condition ($M = 5.59$). The mean biospheric concern scores are shown in Figure 2.

For altruistic concerns, the interaction revealed that for pictures

of animals being harmed, perspective taking produced significantly higher scores ($M = 6.01$) than remaining objective ($M = 5.19$), $F(1, 178) = 5.02, p = .03$. No significant differences were found, however, between the perspective-taking and objective conditions for either the animals in nature or the people in nature conditions.

Discussion

As the problems associated with pollution, overpopulation, energy consumption, overuse of natural resources, and other environmental issues become more

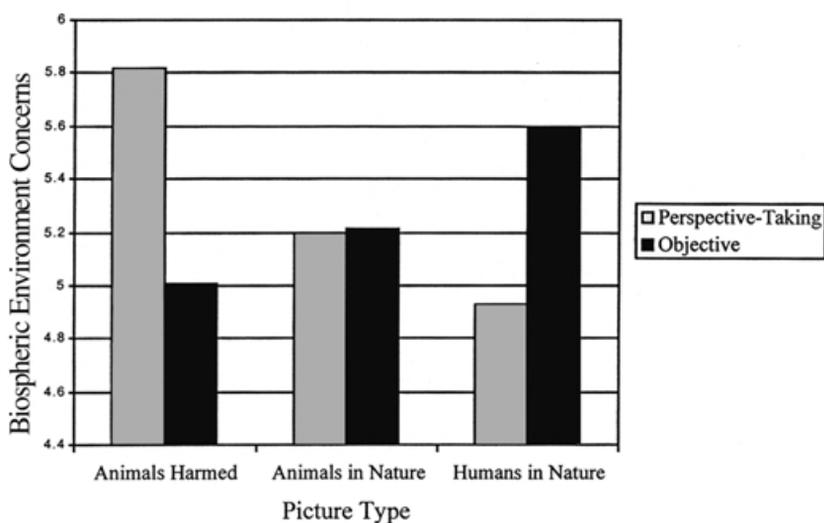


Fig. 2. Mean biosphericism scores as a function of perspective taking and picture type

pressing, one might think that psychologists would step forward with models and theories for understanding environmental concerns, motives, and behaviors. Unfortunately, we have not. Although the psychological study of environmental issues has produced some interesting and useful findings, the bulk of the research tends to be fragmented and difficult to integrate into an organized theory. Much of the research on environmental issues has been based on traditional social psychological theories of attitudes.

One promising theoretical approach to the study of environmental attitudes is the value-basis theory. As articulated by Stern and Dietz (1994) and Stern et al. (1995), the value-basis theory for environmental concern proposes that attitudes are formed by considering a few salient aspects of an attitude object and the relevance of this object to a few salient values. Research in this area has been based on Schwartz's (1977) theory for normative decision making and has focused on an altruistic value. Environmental concerns and behaviors are viewed as the result of an activated altruistic moral norm (e.g., Black, Stern, & Elworth, 1985; Hopper & Nielson, 1991; Schultz & Zelezny, 1998). Building on this work, the value-basis theory proposes that attitudes toward environmental issues can be linked to a broader range of values, not just altruism. Concern for environmental issues can be based on the relevance of environmental damage to self, people, or all living things. The type of concern that develops depends largely on the relevance of attitude objects to activated values.

My approach in the studies described in this article is consistent with the value-basis theory, but my focus was on clusters of valued objects rather than on values per se. That is, I measured specific attitude objects (e.g., concern for plants, people, self) and not values (e.g., equality, loyalty, broad-mindedness, a world of beauty). (See Karp, 1996; Schultz and Zelezny, 1999; or Stern et al., 1995, for data on the relationship between values and environmental attitudes.) The findings reported in this article showed that there are distinct clusters of environmental attitudes: biocentric concerns focus on all living things (plants, marine life, birds, animals), altruistic concerns focus on other people (people in my community, children, all people, my children), and egoistic concerns focus on the self (my health, my future, my lifestyle, me,

and my prosperity). Among a sample of college students, we found evidence for this three-factor model. A similar three-factor structure has been found in an international sample of college students and a sample of California residents (Schultz, 2000).

These results are consistent with Stern and Dietz's (1994) value-basis theory. I further propose, however, not only that these concerns are organized around valued objects, but that these objects are valued because they are included in a person's cognitive representation of self. In 1978, Dunlap and Van Liere proposed that a New Environmental Paradigm (NEP) was emerging in which people viewed humans as an integral part of nature. Subsequent research proceeded to examine correlates of NEP, particularly attitudes and behaviors. The NEP, however measures an individual's perception of the relationship between humans and the natural environment. Stern et al. (1995) have suggested that the NEP reflects a general awareness of the consequences of harming nature. The NEP, in its focus on "humans," is more sociological than psychological.

In this article, I have sketched a psychological variation on the NEP: a social-cognitive perspective that is consistent with several current areas of social psychological research (Aron, Aron, Tudor, & Nelson, 1991; Aron & Fraley, 1999; Batson, 1994; Stern & Dietz, 1994). I have argued that environmental concerns are rooted in a person's interconnection with other people and with the natural environment. I do not suggest that this is a disposition. Indeed, just as a relationship between two people can deepen and become more "interconnected," so too can our relationship with the natural environment.

The results from Study 2 provide some evidence that environmental concerns are malleable across situations. The results showed that when viewing images of animals being harmed by nature, participants instructed to take the animals' perspective expressed significantly higher levels of biospheric environmental concerns than participants instructed to remain objective. To my knowledge, this is the first reported laboratory experiment in which environmental attitudes have been used as a dependent variable; most studies have used environmental concern as a predictor of other attitudes or behaviors or as the criterion variable in studies not involving an experimental manipulation (e.g., as predicted by political ideology, gender, income, and so on). A few notable

exceptions can be found in the environmental education literature in which environmental concerns are measured following an educational activity (for reviews of this literature, see Dwyer, Leeming, Cobern, Porter, & Jackson, 1993; Leeming, Dwyer, Porter, & Cobern, 1993; or Zelezny, 1999).

At this point, it might not be clear why taking the perspective of an animal being harmed by nature would produce an increase in biospheric concerns. One potential explanation for this finding comes from research on perspective taking and empathy (Batson, Turk, Shaw, & Klein, 1995; Davis, Conklin, Smith, & Luce, 1996; Dovidio, Allen, & Schroeder, 1990; Eisenberg & Miller, 1987). The empathy-altruism hypothesis predicts that helping behavior can be produced by both egoistic and altruistic motives. Taking the perspective of a person being harmed leads to empathy and to the activation of an altruistic motive. Empathy is defined as other-oriented feelings of concern about the perceived welfare of another person. In contrast, if the other's perspective is not taken, then empathy is not induced, and the egoistic motive is dominant. Both motives can lead to helping behavior: altruism for no obvious benefit for self, and egoism to gain reward or to avoid punishment for self. This line of reasoning suggests that our perspective-taking manipulation may have generated feelings of empathy and subsequently a greater concern for the welfare of animals and the biosphere.

In addition to producing feelings of empathy, taking perspective may also have temporarily increased the extent to which participants viewed themselves as interconnected with nature. That is, taking perspective may have expanded the participants' inclusiveness of self and reduced the degree of separation that participants perceived between themselves and nature. There is some evidence that a perspective-taking manipulation can have such an effect. Davis et al. (1996) demonstrated that taking the perspective of another person produced a greater degree of other-inclusion in self. That is, when we take the perspective of another person, we expand our boundaries of self to include the other. Davis et al. (1996) showed that experimentally manipulating perspective taking caused observers to create cognitive views of other that overlapped with the observer's own self-representations. Experimentally manipulating perspective taking produced a greater inclusion of other in self (see also Aron et al., 1991, and Aron & Fraley, 1999, for an examination of the changes

in the degree of inclusion of other in self associated with intimate interpersonal relationships). Building on this finding, I view perspective taking as a manipulation of the interconnectedness between self, other, and biosphere.

This perspective on environmental concerns leads to some additional hypotheses for future research. First, attitudes of environmental concern should be positively correlated with measures of empathy, especially empathy scores that focus on perspective taking. Second, it should be possible to assess the content of self-schemata and identify differences in the degree to which people include nature in their cognitive representation of self. Third, it should be possible to experimentally manipulate threats to valued objects (self, other people, plants, and animals) and show predictable patterns of helping behavior for people high in egoistic, altruistic, or biospheric concerns. Finally, it should be possible to develop interventions (cf. Bator & Cialdini, this issue; McKenzie-Mohr, this issue) or environmental education programs that evoke feelings of empathy or inclusion and lead to biospheric environmental concerns.

This approach is especially applicable to environmental education activities. My results suggest that any activity that reduces an individual's perceived separation between self and nature will lead to an increase in that individual's biospheric concern. For example, a hike in the woods, a class trip to a natural park, a family camping trip (in a tent, not a recreational vehicle), an animal presentation in which students can see and touch the animal, or creating birdhouses or gardens should all lead to greater interconnectedness and inclusion. By contrast, a trip to a zoo to see animals in cages, watching animals perform skits or trained shows, hearing information about animals or nature taught abstractly in a classroom, or environmentally destructive recreational behaviors (like off-road motorcycles, jet skis, and snowmobiles) will likely lead to less perceived interconnection and more egoistic attitudes about nature.

Conclusion

In this article, I have demonstrated the existence of a clear three-factor structure for environmental concerns that I labeled egoistic, altruistic, and biospheric. These findings are consistent with Stern's value-basis theory for environmental attitudes. As an

extension, I have attempted to link environmental concern to the inclusion of others in self and to the inclusion of nature in self. Further, I have proposed that these concerns are associated with empathy and that greater levels of inclusion can be produced by taking the perspective of animals being harmed by nature (biospheric) or people being harmed by nature (altruistic). I believe that this conceptualization offers a promising new avenue for basic research on environmental concern and also a useful theory for applied research on encouraging proenvironmental behavior.

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