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Interdependence with the environment: Commitment, interconnectedness, and environmental behavior[☆]

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ABSTRACT

Do individuals' perceptions of their interdependence with the natural environment affect their environmental behaviors? From the perspective of interdependence theory, we introduce a scale to measure commitment to the natural environment. In Study 1, higher levels of commitment to the environment and greater inclusion of nature in the self separately predicted higher levels of pro-environmental behavior, even when controlling for social desirability and ecological worldview. In Study 2, participants primed to experience high commitment to the environment reported greater levels of pro-environmental behavioral intentions as well as pro-environmental behavior relative to participants primed to experience low commitment to the environment. Commitment to the natural environment is a new theoretical construct that predicts environmental behavior.

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1. Introduction

"I wish to speak a word for Nature, for absolute freedom and wildness, as contrasted with a freedom and culture merely civil, –to regard man as an inhabitant, or a part and parcel of Nature, rather than a member of society." (Thoreau, 1862/1993, p. 49).

Writers and speakers have long referred to a personal relationship with the natural environment, using phrases like communing with nature, living in harmony with the environment, and feeling a personal connection to the natural world and its future. These phrases are borrowed from language usually used to describe interpersonal bonds. Can people experience a personal relationship with the environment analogous to how they experience a relationship with another human being? If so, how can we measure such a relationship? Would an assessment of this relationship effectively predict behavior toward the environment?

Recent theory and research reveal intriguing ways in which humans are linked with the natural environment. Indeed, there is some evidence that human beings have evolved to feel a special connection with the natural world. Biophilia is an evolved need to experience the natural environment and an attraction toward life (Wilson, 1984). Visiting natural (versus urban) environments yields restorative effects such as stress reduction and increase in positive

affect (e.g., Hartig, Evans, Jamner, Davis, & Garling, 2003). Moreover, there is evidence of greater overlap between individuals' self-identity and the natural world than between individuals' self-identity and the built world (Schultz & Tabanico, 2007). Human predispositions for scenic views, proximity to water, and savannah-like vistas have guided development and affected the price of land worldwide. It seems clear that human connection to the environment is a special and evolutionarily grounded one.

The present research is not the first to empirically apply interpersonal relationships theory to humans' relationship with the environment. Steel (2000) examined how Sternberg's (1987) triangular theory of love and Walster and Walster's (1978) theory about passionate and companionate love relate to individuals' feelings about the polar environment; Brooks, Wallace, and Williams (2006) provide a rich theoretical discussion about how people's narratives about a national park reveal that they build meaningful relationships with the park over time; and Hay (1998) theorizes that some attachment needs may be met by *sense of place* in the same manner as in interpersonal relationships. In perhaps the most effective empirical application of interpersonal relationships theory, Schultz (2001) adapted Aron and Aron's (1986) self-expansion theory to examine inclusion of nature in the self-concept. Our aim is to provide empirical evidence for a second useful theoretical framework from interpersonal relationships. Below we review existing literature and then propose that relationship commitment, theoretically rooted in interdependence theory, will provide novel insight into our relationship with the environment.

[☆] The first study comprised part of the third author's senior thesis.

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1.1. Our relationship with the environment

Theorists have argued that a unique relationship exists between humans and the natural environment. Typically, when we hear the word “relationship,” we think of two human beings who interact and are mutually dependent. (Only rarely are some other animals accorded the ability to have a relationship, but see Green, Mathews, & Foster, *in press*.) However, human beings are dependent both physically and emotionally on the natural environment; in turn, the fates of species and ecosystems are dependent on the actions of human beings. Little empirical work has examined the nature and implications of the interdependence of humans with nature, particularly the way in which human behavior may be affected by dependence on the environment. Leopold (1949) theorized about how humans’ dependence on nature should correspond to pro-environmental behavior. Below we will summarize developing theory and research about the interconnectedness of humans with the natural world (including concepts such as place attachment and inclusion of nature in the self) and then introduce commitment to the environment as a new approach to understanding the human–environment relationship.

1.1.1. Interconnectedness and identity

The notion of interconnectedness with the environment is emphasized in eastern religions such as Buddhism (Nhat Hahn, 1999) that claim that the boundaries between self and others, as well as self and environment, are blurred or even non-existent, though some variations of these ideas also have a history in the West and have been employed by Western psychologists (Wallace & Shapiro, 2006). Researchers have examined *place identity* (Proshansky, 1978) and *place attachment* (Low & Altman, 1992), which could include a natural setting as *place*. For example, Vaske and Kobrin (2001) demonstrated that emotional attachment to a particular natural setting (i.e., place identity) mediated the link between dependence on the setting and environmentally responsible behavior. Clayton (2003) proposed that an environmental identity can function like a collective identity (e.g., an ethnic identity) and foster connection and felt similarity. She developed an environmental identity scale (e.g., “I spend a lot of time in natural settings”) that correlated with self-reported pro-environmental behavior. In addition, Mayer and Frantz (2004) developed a connectedness to nature scale that assessed feelings of connection and oneness with nature and predicted ecological behavior and subjective well-being. More recently, Dutcher, Finley, and Luloff (2007) presented evidence that individuals’ perception of their connectivity to nature predicts environmental concern and behavior.

Aron and Aron (1986) investigated the concept of interconnectedness between partners in close interpersonal relationships. Their model proposes that individuals include in their self-concept aspects of the partner’s identity, resources, and perspectives. Aron, Aron, and Smollan (1992) constructed a diagram of a series of increasingly overlapping pairs of circles (one representing the self and one representing the partner) to reflect degree of “inclusion of other in the self.” This graphic representation of identity overlap merges the concepts of interconnectedness and closeness. This measure of felt interconnectedness with another has been used fruitfully in close relationships research, and also has been modified for use in other areas (e.g., inclusion of the self in a community and inclusion of the ingroup in the self; Mashek, Stuewig, Furukawa, & Tangney, 2006; Tropp & Wright, 2001). For example, Leary, Tipsord, and Tate (2008) developed the allo-inclusive identity scale that consists of 16 IOS diagrams, in which the “other” is other people or elements of the natural world (e.g., a wild animal, a tree, the earth, all living creatures). They found that the natural world subscale correlated positively with kindness (but not with forgiveness, compassion, or emotional dispositions or life

satisfaction). Most relevant to the present work, Schultz (2001, 2002) adapted the IOS to assess inclusion of nature in the self (INS) by replacing “other” with “nature.” Individuals who perceive interconnectedness between themselves and nature should be likely to engage in behaviors that take into account the perspective of what is good for the environment. Schultz (2001) revealed correlations of INS with self-reported environmental behavior and with ecological worldview.

1.1.2. Commitment

Whether or not individuals feel “close” or “connected” to nature, they are interdependent with nature in the sense that the well-being of nature can affect the well-being of individuals (and vice versa). Research addressing commitment and environmental behavior has considered commitment primarily in one dimension: commitment to *behavior* (e.g., Hines, Hungerford, & Tomera, 1986–1987). However, an important aspect of any type of relationship is commitment to the *partner*, an entirely different construct (Rusbult, 1980); the natural environment may be viewed as a relationship partner with whom individuals experience greater or lesser commitment. Interdependence theory (Kelley & Thibaut, 1978; Rusbult & Arriaga, 2000), arguably the most influential theory of relationship interaction, focuses on how the structure of a relationship will affect motivations and behavior over time. As such, interdependence theory provides a rich framework for characterizing the human–environment relationship. Just as two individuals may affect each other’s well-being, humans and the natural environment have a reciprocally dependent relationship. *Dependence* is the degree to which individuals rely uniquely on a relationship partner (e.g., the environment) for the gratification of important needs. What leads to greater dependence? Interdependence theory posits two main paths toward greater dependence: individuals will be more dependent on a relationship partner to the extent that (1) the partner fulfills important needs (i.e., the individual is satisfied with the partner); and (2) those needs cannot be fulfilled without the partner (i.e., the individual is dependent on the partner). Research on recreational *place dependence* is very much in line with this reasoning (Stokols, 1981). Recreation researchers have examined how dependence on particular settings (e.g., trout stream, local natural resource areas) can affect individuals’ feelings and behaviors toward those settings (Hammit, Backlund, & Bixler, 2006; Vaske & Kobrin, 2001).

Rusbult (1980) extended interdependence theory by developing a theory about relationship commitment that is recognized as one of the leading theories in interpersonal relationships psychology. A key tenet of her theory is that greater dependence will lead to greater felt commitment for a relationship partner. “Whereas reliance on a partner for need fulfillment is *dependence*, *commitment* is the subjective experience of that dependence (Le & Agnew, 2003, p. 38). For interpersonal relationships, commitment is defined via three interrelated components – psychological attachment, long-term orientation, and intent to persist (Rusbult, Olson, Davis, & Hannon, 2001). Researchers have extended this interpersonal theory of commitment to non-interpersonal topics such as job commitment (Farrell & Rusbult, 1981) and college students’ commitment to their schools (Geyer, Brannon, & Shearon, 1987). Accordingly, we suggest that individuals experience a subjective level of commitment to the natural environment, which we define as psychological attachment to and long-term orientation toward the natural world. (Intent to persist does not seem as relevant for the human–natural environment relationship.) To the degree that individuals perceive that they are dependent on the natural environment for their own well-being (e.g., they derive satisfaction from spending time scuba diving), they will experience a corresponding level of commitment to the environment (e.g., they will be interested in maintaining the well-being of coral reefs over time). From the perspective of interdependence theory, such

interest in the well-being of the environment has a structural explanation (i.e., dependence on the environment for the unique gratification of needs) and not a connectedness or closeness explanation (e.g., nature is part of my self-concept).

There is a well-established literature in interpersonal relationships psychology about various outcomes of commitment to relationship partners. When faced with alternative behaviors in a relationship context, committed individuals may be tempted to act on immediate self-interest; however, in a process termed *pro-relationship transformation of motivation*, their actual behavior instead is guided by what is best for the relationship or by what is best for the partner. Individuals who perceive interdependence with the natural world may similarly engage in transformation of motivation such that their behaviors are consistent with the well-being of the environment. In close relationships research, a high degree of perceived commitment to one's partner leads to pro-relationship behavior, in both the cognitive and behavioral domains. In the cognitive domain, Agnew, Van Lange, Rusbult, and Langston (1998) found that couples exhibited more cognitive interdependence – a collective self-and-partner mental representation – when commitment was stronger. In the behavioral realm, in situations characterized by noncorrespondent outcomes (i.e., situations when the behavioral choice that would lead to positive outcomes for an individual is different than the behavioral choice that would lead to positive outcomes for the partner), high commitment predicts willingness to sacrifice for the partner's benefit (Van Lange et al., 1997). In short, individuals who are committed to their relationship partners are likely to engage in transformation of motivation such that they enact behaviors with the well-being of the partner or the relationship in mind.

How does commitment to the environment – from a relationship point of view – relate to environmental behavior? Might the subjective experience of commitment to the environment influence pro-environmental behavior? The current research proposes that individuals who are committed to the environment will be likely to move beyond self-interest and act with the well-being of the environment in mind.

1.2. Environmental attitudes and behavior

The focus of the present work is to assess whether commitment to the environment predicts pro-environmental behaviors. We decided to compare the predictive value of commitment to the environment with a measure of attitudes toward the environment. A great deal of research has shown that pro-environmental attitudes significantly predict behavior (e.g., Kaiser & Gutscher, 2003); however, environmental attitudes are not an all-encompassing predictor of behavior (e.g., Guagnano, Stern, & Dietz, 1995; Scott & Willits, 1994). Kaiser, Wolfing, and Fuhrer (1999) found that attitudes are a strong predictor of behavior when behavior is examined on a general, more inclusive level. The new environmental paradigm (Dunlap & Van Liere, 1978) scale and its revision, the new ecological paradigm scale (Dunlap, Van Liere, Mertig, & Jones, 2000) have been widely used measures of ecological beliefs. The new ecological paradigm (NEP) scale assesses endorsement of an ecological worldview, which consists of fundamental beliefs about the environment that influence a wide range of attitudes. We include the NEP in the present research because we would like to determine (a) whether our new measure for commitment to the environment relates to it; and (b) whether our commitment to the environment measure predicts behavior above-and-beyond this established measure.

1.3. The present research

The present research focuses on the connection between individuals' relationships with the environment and their

environmental behavior. We included two measures of individuals' perceptions of a personal relationship with the environment. Rusbult, Martz, and Agnew's (1998) commitment scale measures the level of commitment to a close partner. We adapted this measure to assess individuals' level of commitment to the environment. Aron et al.'s (1992) inclusion of other in the self (IOS) scale measures individuals' beliefs of how interconnected they feel with their partner via a series of overlapping circles labeled self and other. We used an adapted version of the IOS scale to measure individuals' beliefs of how interconnected they feel with the environment (the inclusion of nature in the self [INS] scale; also see Schultz, 2001). Environmental behavior was measured using an inclusive general ecological behavior scale (GEB; Kaiser, Doka, Hofstetter, & Ranney, 2003). In order to directly compare the predictive power of our commitment to the environment measure with an established measure, we also included the NEP scale (Dunlap et al., 2000).

2. Study 1

In Study 1, we examined the relationship between self-reported relationship with the environment and self-reported environmental behavior. We predicted that participants who reported greater commitment to the environment would also report greater pro-environmental behavior (Hypothesis 1). In line with previous research, we also predicted that participants who reported greater interconnectedness with the environment, as measured by the inclusion of nature in the self (INS) scale, would also report greater pro-environmental behavior (Hypothesis 2). In addition, we predicted that the commitment to the environment scale and the INS scale would demonstrate convergent validity by correlating significantly with each other (Hypothesis 3). Finally, we predicted that commitment to the environment and INS would independently predict degree of pro-environmental behavior, even when controlling for social desirability and for ecological worldview with the NEP scale (Hypothesis 4).

2.1. Method

2.1.1. Participants

Participants were 71 undergraduate students (26 males, 45 females) recruited from Soka University in Southern California. Participants were 20 years old on average (ages ranged from 17 to 26 years); 42% were freshman, 24% were sophomores, 7% were juniors, and 27% were seniors. Sixty-eight percent of participants were Asian, 12% were Caucasian, 3% were Latino, 1% were African American/African, and 11% listed other. Participants signed up for a drawing to win a \$25 gift card as reimbursement for their participation. Approximately 95% of students approached agreed to complete the survey.

2.1.2. Measures

2.1.2.1. Person–environment relationship. The person–environment relationship was measured using two scales adapted from well-established close relationship measures. Aron et al.'s (1992) inclusion of other in the self (IOS) scale is a closeness measure that describes the interconnectedness of individuals with their partners using Venn-like pictorial diagrams. We included in our study an adapted version of the IOS scale designed to measure inclusion of nature in the self (see Fig. 1; Schultz, 2002). The diagrams consisted of two circles with varying degrees of overlap; one circle represented the self, and the other circle represented nature. Participants selected from seven Venn-like diagrams which degree of overlap of circles best described their relationship with nature. Each figure had consistency in area, diameter, and increase in overlap. We converted diagram choice to numbers (1 = least overlap,

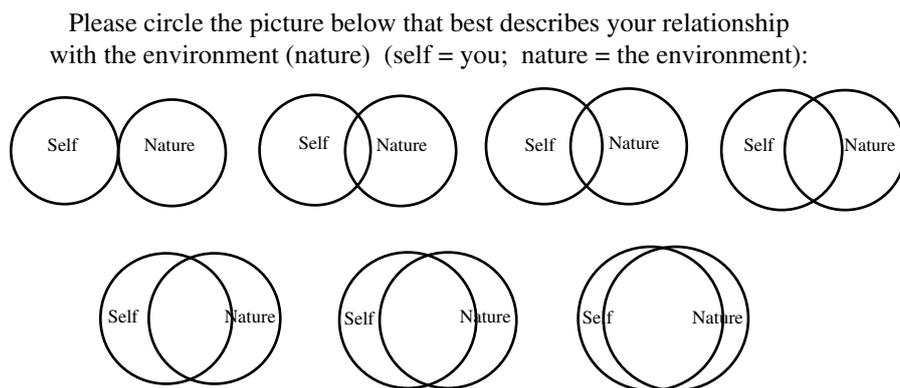


Fig. 1. Inclusion of Nature in the Self.

7 = greatest overlap); higher scores represented greater inclusion of nature in the self ($M = 4.30$, range = 2–7).

We adapted the Rusbult et al. (1998) commitment to a close relationship scale to assess commitment to the environment. We designed items with two categories in mind: psychological attachment (e.g., “I feel very attached to our relationship” was changed to “I feel very attached to the natural environment”) and long-term orientation (e.g., “I am oriented toward the long-term future of my relationship” was changed to “I am interested in strengthening my connection to the environment in the future”). Participants responded to 11 items on a 9-point scale (0 = *do not agree at all*; 8 = *agree completely*; $\alpha = .91$; see Appendix). One item was reverse-scored. We averaged responses to items to create a composite index for commitment, with higher scores representing greater commitment to the environment ($M = 5.76$, range = 4.25–6.90).¹

2.1.2.2. Environmental behavior. Environmental behavior was measured using an adapted version of the general ecological behavior (GEB) scale, a well-established self-report measure developed by Kaiser et al. (2003). Items on the scale are ecological behaviors as well as their counterpart (non-ecological) behaviors. Participants lived on campus in residence halls, so items that were not relevant to the student context were adjusted or omitted. Thirty-five items were omitted from the original GEB because they did not directly relate to student life on campus (e.g., “I bought solar panels to produce energy”). Three items were slightly adjusted for appropriateness (e.g., “The heater in my house is shut off late at night” was adjusted to “The heater in my room is shut off late at night”). Four items that relate directly to student life were added to the GEB (e.g., “I turn off my computer when I’m not using it;” “I leave the water on while brushing my teeth”).

Our adapted version of the GEB included 28 items in six categories: energy conservation (e.g., “I use energy-efficient bulbs”); mobility and transportation (e.g., “I ride a bicycle or take public transportation to work or other”); waste avoidance (e.g., “I re-use my shopping bags”); consumerism (e.g., “I use rechargeable batteries”); recycling (e.g., “I collect and recycle used paper”); and other social behaviors (e.g., “When I do outdoor sports, I stay within

the allowed area”). For each item, participants reported their behavior on a 5-point scale (1 = *never/no*; 5 = *always/yes*; $\alpha = .76$). Eleven items were reverse-scored. We averaged responses to items to create a composite index for GEB, with higher scores representing greater pro-environmental behavior ($M = 3.44$, range = 2.00–4.60).²

2.1.2.3. Social desirability. We included a shortened, 8-item version of Crowne and Marlowe’s (1960) social desirability scale (SDS) as a control variable. According to Ray (1984), the eight items demonstrate acceptable reliability. Each item includes either a ‘yes’ or ‘no’ response (e.g., “Are you quick to admit making a mistake?”; “Are you always courteous, even to people who are disagreeable?”). The socially desirable response was coded as 3; the non-socially desirable response was coded as 1; and the not-sure response was coded as 2 ($\alpha = .66$). We averaged the items to create a composite index for social desirability, with higher scores representing greater social desirability ($M = 1.91$, range = 1.00–3.00).

2.1.2.4. New ecological paradigm. The new ecological paradigm (NEP) scale (Dunlap et al., 2000) is a widely used scale that measures individuals’ endorsement of an ecological worldview. The NEP scale consists of 15 items designed to measure beliefs about nature and humans’ relationship with it (e.g., “Humans are severely abusing the environment”; “Plants and animals have as much right as humans to exist”). For each item, participants responded on a 5-point scale (1 = *strongly disagree*; 5 = *strongly agree*; $\alpha = .66$). Seven items were reverse-scored. We averaged responses to items to create a composite index for the NEP, with higher scores representing a greater ecological worldview ($M = 3.86$, range = 2.85–4.45).

2.2. Results and discussion

2.2.1. Correlational analyses

Table 1 presents correlations of general ecological behavior with our predictors. Consistent with Hypothesis 1, there was a significant correlation of general ecological behavior (GEB) with commitment to the environment, $r(71) = .60$, $p < .001$. Likewise, consistent with Hypothesis 2, there was a significant correlation of inclusion of nature in the self (INS) with GEB, $r(71) = .49$, $p < .001$. Consistent with Hypothesis 3, there was also a significant correlation of commitment to the environment with INS, $r(71) = .53$, $p < .001$. In

¹ In order to explore our expectation that items on the commitment to environment scale would load on a single factor we performed a factor analysis using maximum likelihood extraction and an oblique promax rotation. The first factor had an eigen value of 6.08 and explained 55% of the variance; a second factor had an eigen value of 1.13 and explained only 10% of the variance. The pattern of factor loadings on the second factor was not theoretically interpretable; there was only one item that loaded higher on the second factor than on the first, and its loading on the first factor was reasonably high, at .64). These results are consistent with a single-factor interpretation of the scale.

² Kaiser and Wilson (2000) compared GEB scale reliability when using a dichotomous response format versus a continuous rating scale response format. They found a significant correlation between the two response formats, suggesting that a continuous rating scale format is a reliable way to measure GEB.

short, both commitment to the environment and including nature in the self correlated significantly with environmental behavior.

2.2.2. Regression analyses

We performed hierarchical multiple regression to examine predictors of general ecological behavior (GEB). Table 2 presents two regression models predicting GEB. For Model 1, we regressed GEB onto the new ecological paradigm (NEP) scale and the social desirability scale ($R^2 = .14$). As expected, the extent to which participants endorsed an ecological worldview (NEP) significantly predicted pro-environmental behavior, even when controlling for social desirability, $\beta = .33$, $t(68) = 2.88$, $p < .005$.

For Model 2, we regressed general ecological behavior (GEB) onto the new ecological paradigm (NEP) scale, social desirability, commitment to the environment, and inclusion of nature in the self (INS; $R^2 = .39$). In support of Hypothesis 4, commitment significantly predicted GEB, $\beta = .36$, $t(66) = 2.88$, $p < .005$. Likewise, INS significantly predicted GEB, $\beta = .27$, $t(66) = 2.42$, $p < .02$. However, when we included the two relationship measures in the model, the NEP effect on ecological behavior was nonsignificant, $\beta = .18$, $t(66) = 1.65$, $p < .10$. Both commitment to the environment and INS independently predicted GEB when simultaneously taking into account other variables (ecological worldview [the NEP scale] and social desirability). That is, even after taking socially desirable responses and scores on the NEP into account, commitment to the environment and inclusion of nature in the self independently predicted pro-environmental behavior.

3. Study 2

Study 1 provided evidence that individuals' perceptions of their relationship with the environment (as measured by the INS scale and commitment to the environment scale) are associated with their environmental behaviors. However, because Study 1 was correlational in design, the results did not specify the causal relation between individuals' perception of their relationship with the environment and their environmental behavior. Therefore, in Study 2 we manipulated individuals' perceptions of their relationship with the environment in order to examine the causal effect of a commitment to environment prime on environmental behavior.

Construct activation methodologies (i.e., selectively activating certain concepts or goals stored in memory) such as priming have been fruitfully employed to experimentally investigate close relationships constructs, such as attachment (Green & Campbell, 2000) and commitment (Finkel, Rusbult, Kumashiro, & Hannon, 2002). When particular constructs are activated, associated concepts in memory should be more likely to be activated and thus more likely to be applied to judgments or behaviors. These constructs can be activated in numerous subliminal and supraliminal ways. For example, individuals primed with the stereotype of the elderly via a sentence completion task in which elderly-related words were embedded subsequently walked more slowly down a hallway after they thought the experiment had concluded (Bargh, Chen, & Burrows, 1996). Those primed with the traits "adventurous" or "reckless" via an ostensibly unrelated memorization task subsequently described a target named Donald consistently with the words they had memorized (Higgins, Rholes, & Jones, 1977). In the

Table 1
Intercorrelations of general ecological behavior with predictors.

	GEB	COM	INS	NEP
General ecological behavior (GEB)	–	.60**	.49**	.37*
Commitment to environment (COM)		–	.53**	.44**
Inclusion of nature in the self (INS)			–	.08
New ecological paradigm (NEP)				–

Note. ** $p < .001$; * $p < .01$; $N = 71$.

Table 2
Summary of regression analyses predicting general ecological behavior (GEB).

	β	t	p	R^2
Model 1				
New ecological paradigm	.33	2.88	<.01	.14
Social desirability scale	.18	1.61	<.11	
Model 2				
New ecological paradigm	.18	1.65	<.10	.39
Social desirability scale	.07	0.67	<.51	
Commitment	.36	2.88	<.01	
Inclusion of nature in the self	.27	2.42	<.02	

Note. $N = 71$. Standardized betas are reported.

relationships realm, attachment constructs like avoidance and anxiety have been activated via exposure to an attachment figure's name (Gillath et al., 2006) or via a sentence completion task (Green & Campbell, 2000). Priming methods temporarily activate concepts or goals, and allow researchers to experimentally test hypotheses by randomly assigning only some participants to be primed with the target concept.

Because commitment emerges from dependence, it should be possible to prime a high sense of dependence on the natural environment (e.g., by focusing on the ways in which one's well-being is affected by the well-being of nature). In Study 2, using the method employed by Finkel et al. (2002), we primed high and low commitment to the environment via open-ended questions that led participants to write about greater interdependence with the environment (high-commitment prime) or lesser interdependence with the environment (low-commitment prime). To enhance the ecological validity of our research, we included a behavioral measure of environmental behavior in addition to a self-report measure of behavioral intentions. We predicted that participants who were primed to experience high commitment to the environment would report greater pro-environmental behavioral intentions (Hypothesis 1) as well as behavior (Hypothesis 2) compared to participants who were primed to experience low commitment to the environment.

3.1. Method

3.1.1. Participants

Participants were 70 undergraduate students at Virginia Commonwealth University (35 male, 35 female) who participated in partial fulfillment of the requirements for their introductory psychology course. Participants were 19 years old on average (ages ranged from 18 to 26 years); 61% were freshman, 23% were sophomores, 9% were juniors, and 6% were seniors. Forty-two percent of participants were Caucasian, 21% were African American, 14% were Asian, 3% were Latino, and 1% listed other.

3.1.2. Procedure

Participants signed up for a 30 min session to complete a questionnaire packet. Participants were randomly assigned to experience high commitment to the environment or low commitment to the environment. In order to minimize awareness of any link between the prime and the dependent measures, the experimenter told participants that they were completing two different studies.

We modeled our priming procedure on Finkel et al. (2002), who successfully primed commitment levels to close partners. Participants first completed a questionnaire that included five open-ended questions. Participants in the high-commitment prime condition responded to questions designed to activate thoughts regarding dependence and commitment to the environment (e.g., "Describe one or two ways in which you feel connected with the natural environment. Also what are some ways the environment does something positive for you [e.g., some way that being

outdoors or in nature benefits you]”). Participants in the low-commitment prime condition responded to questions designed to activate thoughts regarding independence and lack of commitment to the environment (e.g., “Most things we do don’t actually help or hurt the environment. What are some examples of things you do each day that have no impact on the environment?”). We designed the questions for each prime to be counterparts of one another. After participants completed the writing-task prime, the first experimenter collected their responses and then a second experimenter administered the questionnaire packet for the ostensibly unrelated study.

Included measures were the same as in Study 1 with the following minor changes. First, we edited the general ecological behavior (GEB) scale to measure behavioral intentions instead of current behavior (e.g., we changed “I collect and recycle used paper” to “I will collect and recycle used paper”). Second, we changed the instructions for the commitment to the environment and new ecological paradigm (NEP) scales to emphasize participants’ *current* feelings about their relationship with the environment. Participants reported demographic information and completed the GEB ($M = 3.21$, range = 2.21–4.10), NEP ($\alpha = .79$, $M = 3.61$, range = 1.93–4.67), and the commitment to the environment scale ($\alpha = .91$, $M = 5.25$, range = 1.82–7.91).³

After participants completed the questionnaire packet and walked out of the room, an experimenter approached them and said:

“The faculty member in charge of this experiment gave me permission to hand out this flyer about a volunteer opportunity with a club that I’m involved in. I was wondering if you would be willing to either sign up for a river clean up for this Saturday or a future Saturday or sign up to be on our email-list to find out about future volunteer activities?”

Participants recorded written yes/no answers separately for the river clean-up and the email-list, and included their email address if they agreed to the latter request. Finally, participants were thanked and debriefed.

3.2. Results and discussion

3.2.1. Manipulation check

We performed a *t*-test to determine whether the priming manipulation affected participants’ scores on the commitment to the environment scale. Participants in the high-commitment prime group ($M = 5.55$) had marginally higher scores on the commitment to the environment scale compared to participants in the low-commitment prime group ($M = 4.96$), $t(68) = -1.79$, $p < .08$. Because the priming manipulation yielded only a marginally significant effect on participants’ responses to the commitment to the environment scale, we did not test for the possible mediating role of the commitment to the environment scale in the effect of priming condition on environmental behavior. It is possible that our priming manipulation was not powerful enough to cause significant change in participants’ felt commitment to the

environment; future research could examine a modified version of the priming manipulation in order to test for such mediation.

3.2.2. Effect of commitment to the environment prime on environmental attitudes, behavioral intentions, and behavior

We performed two *t*-tests to determine the effect of the commitment to the environment prime on behavioral intentions and attitudes. Consistent with Hypothesis 1, participants in the high-commitment prime group ($M = 3.35$) reported higher scores on the general ecological behavior (GEB) scale compared to participants in the low-commitment prime group ($M = 3.07$), $t(68) = -3.19$, $p < .002$. However, participants in the high-commitment prime group ($M = 3.67$) reported similar scores on the new ecological paradigm (NEP) scale compared to participants in the low-commitment prime group ($M = 3.55$), $t(68) = -0.91$, $p < .36$.

In addition to these self-report measures, we included a behavioral measure. In order to create a more powerful behavioral measure, we combined participant responses to the river clean-up request and email-list request (Spearman’s $\rho = .54$, $p < .001$) to form a single measure such that participants who answered “yes” to both requests were scored as a 1 and participants who did not answer “yes” to both requests (i.e., who responded “no” to either request) were scored as a 2. Consistent with Hypothesis 2, a Chi-square analysis revealed that participants in the high-commitment prime group were more likely to say “yes” (54%) to the requests than participants in the low-commitment prime group (32%), $\chi^2(1, N = 70) = 3.73$, $p < .05$. In summary, and consistent with both hypotheses, experiencing a high-commitment to the environment prime led to greater pro-environmental behavioral intentions as well as greater likelihood of agreeing to perform local pro-environmental behavior.

4. General discussion

Two studies present commitment to the environment as a new theoretical construct useful for understanding the person–environment relationship. We characterize commitment to the environment as composed of psychological attachment to and long-term orientation toward the natural world, and propose a scale to assess the construct. In Study 1, correlation and regression analyses revealed that individuals who reported greater levels of commitment to the environment also reported greater pro-environmental behavior (as measured by the general ecological behavior [GEB] scale). Similarly, individuals who reported a greater degree of felt interconnectedness with the environment, as measured by the inclusion of nature in the self (INS) scale, reported greater numbers of pro-environmental behaviors. In addition, the newly developed commitment to the environment scale correlated significantly with INS and with ecological worldview (measured by the new ecological paradigm [NEP]); the commitment to environment scale also demonstrated high internal reliability. Finally, commitment to the environment and INS separately predicted pro-environmental behavior when controlling for other relevant measures (i.e., social desirability and ecological worldview).

Study 2 revealed that participants primed to experience high commitment to the environment scored higher on a behavioral intentions version of the GEB scale than participants primed to experience low commitment to the environment. In addition, the commitment to environment prime affected participants’ responses to an ostensibly unrelated request: Participants primed to experience high commitment to the environment were more likely to agree to participate in a river clean-up and to join an email-list for future volunteer opportunities. Thus, Study 2 extended the findings of Study 1 by including a behavioral measure and by demonstrating a causal relationship between the commitment prime and behavioral intentions.

³ In an attempt to replicate the Study 1 finding of a single-factor for the commitment to environment scale, we performed a factor analysis using maximum likelihood extraction and an oblique promax rotation. The first factor had an eigen value of 6.24 and explained 57% of the variance; a second factor had an eigen value of 1.04 and explained only 9% of the variance. Item loadings on the first factor ranged from .36 to .87, with an average factor loading of .67. The pattern of factor loadings on the second factor was not theoretically interpretable; there were three items that loaded higher on the second factor than on the first, but their loadings on the first factor were reasonably high, ranging from .53 to .80). These results replicate the single-factor interpretation of the scale from Study 1.

The successful predictive validity of the commitment to the environment scale suggests that future research should focus on the interdependent nature of the person–environment relationship to better understand and predict pro-environmental behavior. Just as commitment and interconnectedness are strong predictors of relationship-enhancing behavior in close relationships (Aron et al., 1992; Rusbult et al., 2001), commitment to the environment and interconnectedness with the environment also are strong predictors of pro-environmental behavior.

4.1. Future research

We hope that the present work opens up new vistas for future research on commitment to the environment. Close relationships research has identified three key antecedents to commitment: satisfaction, alternatives, and investments (Le & Agnew, 2003); future research could explore the extent to which these antecedents are useful predictors of commitment to the environment. For example, future research could address how increasing investment in the environment may increase commitment to the environment. Similarly, positive experiences with the environment (which would relate to increasing satisfaction) may increase commitment to the environment. Finally, the degree to which there are alternatives to the environment that can meet individuals' needs may inversely relate to felt commitment to the environment. Future research could also explore various consequences of commitment. For example, are individuals who are highly committed to the environment willing to sacrifice—to forgo immediate self-interest for the long-term benefit of the other (i.e., the natural world)?

Research on different motivational orientations as well as research on the impact of fear appeals on persuasion converge to suggest that approaches emphasizing negative affect may be rather limited. Focusing on commitment to the environment may be a more positive and more promotion-focused (i.e., concern over accomplishment and growth) than prevention-focused (i.e., concern over security and the avoidance of negative outcomes) approach (Higgins, 1997) that may yield success. That is, emphasizing the positive nature of this relationship may yield more success in changing behavior relative to approaches that highlight prevention or threat. For example, Crowe and Higgins (1997) found that participants who had a prevention focus when working on a difficult task or after experiencing failure gave up more quickly compared to participants who had a promotion focus. The literature on fear appeals, largely in health domains, suggests that fear appeals may result in poor processing of the persuasive message, reduced tendency to act on the message, message rejection, or even boomerang attitude shifts in the opposite direction (e.g., Jepson & Chaiken, 1990). Fear appeals appear to be least effective when the level of fear is relatively high and individuals feel low efficacy to effect a change (Witte & Allen, 2000). Individuals who feel overwhelmed and helpless regarding the litany of environmental concerns might simply give up. However, a promotion focus on dependence and interconnectedness with the environment may yield longer lasting or more pervasive transformation of motivation.

In another line of work, Bragg (1996) presents a detailed theoretical overview about how the development of an “ecological self” could facilitate pro-environmental behavior. She theoretically extends Marcus and Kitayama's (1991) model of a self-construal that includes interdependence with others to the possibility of a self-construal that includes interdependence with the natural environment, and posits that certain consequences of such a self-construal may occur: Individuals with an “ecological construal of self” may experience cognitive, emotional, and motivational responses regarding the environment consistent with their self-construal. Future research could examine these hypotheses and

then explore how such an ecological self can be understood in the role of relationship partner with the natural environment.

Future research may also want to address the current variety of scales and measures that assess environmental identity, connection with the environment, and commitment to the environment. All appear to have made a substantial contribution to the literature in recent years, but further clarification regarding conceptual overlap would be fruitful. Likewise, it could be fruitful to explore the implications of a relationship partner (i.e., the natural world) that does not affect our well-being in an intentional manner, with the associated motives and affect that a human partner would. The predictive power of each measure may depend in part on whether the criterion is more cognitive, affective, or behavioral. Our undergraduate samples were ethnically diverse compared to the norm, but future research also should export these notions to different (e.g., non-university) populations to investigate whether commitment to the environment is felt similarly by, for example, older individuals or members of collectivistic cultures.

Thoreau felt that he was “part and parcel” of nature and was highly committed to nature and all its “wildness.” The sentiments of felt attachment and long-term orientation toward the natural world were reflected in both his writing and his actions. The structure of the relationship between humans and the natural world (i.e., their interdependence) has implications for understanding individuals' orientation toward the environment. Researchers and activists interested in predicting as well as influencing attitudes and behaviors toward the environment may benefit from measures such as commitment that assess the subjective experience of interdependence of humans with nature.

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Appendix. Commitment to the environment

To what extent does each statement describe your attitudes about your relationship with the natural environment? Please use the following scale to record your answers.

0	1	2	3	4	5	6	7	8
Do not agree at all				Agree somewhat				Agree completely
—	1.	I am interested in strengthening my connection to the environment in the future.						
—	2.	I feel strongly linked to the environment.						
—	3.	When I make plans for myself, I take into account how my decisions may affect the environment.						
—	4.	It seems to me that humans and the environment are interdependent.						
—	5.	It makes me feel good when something happens that benefits the environment.						
—	6.	Feeling a connection with the environment is important to me.						
—	7.	I expect that I will always feel a strong connection with the environment.						
—	8.	I believe that the well-being of the natural environment can affect my own well-being.						
—	9.	It is unlikely that I'll feel a connection to the environment in the future. (R)						
—	10.	I feel very attached to the natural environment.						
—	11.	I feel committed to keeping the best interests of the environment in mind.						

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