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THE ROLE OF EMOTION IN ENVIRONMENTAL DECISION MAKING

By

Hannah L. Dietrich

A DISSERTATION

Presented to the Faculty of  
The Graduate College at the University of Nebraska  
In Partial Fulfillment of Requirements  
For the Degree of Doctor of Philosophy

Major: Psychology

Under the Supervision of Professor Brian H. Bornstein

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# THE ROLE OF EMOTION IN ENVIRONMENTAL DECISION MAKING

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University of Nebraska, 2013

Adviser: Brian H. Bornstein

Given the environmental concerns of our planet, it is imperative to consider issues of environmental sustainability. Researchers argue that the most serious environmental problems are not merely issues of science, but that of individual behavior. Solutions, therefore, must consider the role of the individual—how one can change his/her behaviors to be more environmentally conscious. The experience of negative or positive emotions, may impact not only people's experiences with the environment, but also their tendency to engage in pro-environmental behavior. The present study sought to experimentally investigate the role of emotion and information on pro-environmental behavior change. Results indicate that neither emotion nor information was found to influence pro-environmental behavior change. The study confirms, however, the importance of pro-environmental attitudes on predicting behavioral intentions, and current pro-environmental behaviors as a necessary predictor of pro-environmental behavior change. Just as old behavior patterns are identified as barriers to pro-environmental behaviors, the opposite is also true: individuals who already engage in a number of pro-environmental behaviors are most likely to adopt new behaviors to reduce their ecological footprint and increase their sustainability efforts.



## DEDICATION

“Happy people make the world a better place.”

I would like to dedicate this dissertation work to my dear friend, “Grandpa” Eugene (Gene) Slocum. Thank you for reminding me that the best things in life are the moments we share with those we love: warm chocolate chip cookies in the sunshine, watching the cattle graze on a summer evening, and brown-sugar oatmeal with butter every Sunday morning. Life without you will never be the same, but because of you, my life has been forever changed. You are one of my favorites.

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To the casual observer, a doctoral dissertation may appear to be solitary work. A project of this magnitude, however, requires a network of support, and I am indebted to many people.

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I would have never even considered pursuing my doctoral degree were it not for my two role models, Dr. Nancy Steblay and Dr. Edith Greene. Thank you for your mentorship, but more importantly, your friendship. I still want to be “just like you” when I grow up.

I have far too many colleagues and friends to name who have commiserated and celebrated this journey with me. Thank you for providing perspective, respite, and the necessary motivation to finish. I am truly thankful to know and have you in my life.

To my family—my parents, Jeff & Kathy Dietrich; my siblings, Justin, Cody, and Sadie Dietrich; and my in-laws, Bruce & Kathy and Ross Swanson: there were many years when I was not sure I would finish, but your support was the reassurance I needed. Thank you for believing that I could and would. I hope to make you proud of me, just as I am of each of you.

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carried me through the ups and downs of this work; I am continuously humbled by your selfless love. Thank you for joining me on this journey, and your unwavering support and encouragement throughout this process. You have certainly upheld your end of loving me through my “worse;” here’s to the “for better” in the future.

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## **CHAPTER I**

### **INTRODUCTION**

Global warming, animal extinction, deforestation, and natural resource depletion are among the many signs that the Earth's natural environment is in danger. The consequences of environmental problems like these range from health problems to the very existence of the planet. Environmental problems have become a "hot topic" among politicians, experts, religious leaders, popular media stars, marketing strategists, and lay people. The push to "go green" is evident in our everyday lives—from the food we buy and the products we use in our homes, to our means of transportation and energy sources we support. The scope of environmental concerns extends well beyond national borders (Environmental Protection Agency, 2010). Such concern is certainly warranted; environmental problems occur in various forms and affect all members of the global society (Tenbrunsel, Wade-Benzoni, Messick, & Bazerman, 1997a). A failure to rectify these environmental problems jeopardizes the viability of our planet. If we intend to actually sustain our planet—to ensure that future generations can live on Earth—we need to become allies of the planet and engage in behaviors toward that goal.

Given the environmental concerns of our planet, it is imperative to consider issues of environmental sustainability. Environmental sustainability is defined as "the urgent need ... to use the Earth's resources in ways that will allow human beings and other species to continue to exist acceptably on Earth in the future" (Oskamp, 2000, p. 373). This definition is important because it appropriately places individual humans at the crux of the issue. The ways in which humans live have serious impacts for the future of the planet. Researchers argue that the most serious environmental problems are not merely

issues of science, but also of individual behavior. Current environmental problems are exacerbated by human behavior. Koger and Winter (2010) aptly note, “‘environmental problems’ are really behavioral problems” (p. 2) caused by the thoughts, beliefs and values that guide human behavior (Smith, Shearman, & Positano, 2007; Winter, 1996). As the study of human behavior, psychology is uniquely positioned to help us understand how humans interact with the natural environment—both positively and negatively. Furthermore, solutions must consider the role of the individual; how one can change his/her behaviors to be more environmentally conscious. Social psychology provides a framework for such solutions.

Social psychology is “the study of how people's thoughts, feelings, and behaviors are influenced by the actual, imagined, or implied presence of others,” (Allport, 1985, p. 3). As such, it allows us to apply theories of human behavior to devise solutions for social dilemmas, like environmental sustainability.

### *Understanding the human problem*

Human behavior contributes to the major threats to the Earth's environment (Oskamp, 2000). Sources indicate that while a majority of North Americans agree that environmental conditions are worsening, only a small minority of people are willing to change their behavior to protect the environment (Koger & Winter, 2010). There are a number of psychological mechanisms that may contribute to individuals' lack of change. For example, a number of contemporary environmental crises do not occur suddenly—they take centuries to develop. This inhibits individuals' ability to see the direct impacts of their behavior, even if they engage in the behavior daily over the course of their lifespan (e.g., driving to and from work). In general, humans are shortsighted and often

delay action to ameliorate problems until they are readily apparent (Koger & Winter, 2010). Research by Loewenstein and Thaler (1989) found that people will focus on short-term considerations at the expense of potential future impacts. This is particularly true with environmental decision making. For example, homeowners may fail to purchase energy-efficient appliances or light bulbs (which would have a long-term rate of return) in favor of saving money in the short-term (Shu & Bazerman, 2010). Globally, this short-sightedness has had negative impacts on the environment. For example, Hoffman and Bazerman (2007) note that the depletion of over half of the world's largest fishing basins is a stark indicator of likelihood to engage in short-term decision making, without regard for future impacts.

People may also have different psychological reactions to the current environmental crisis. Koger & Winter (2010) argue that humans can adopt a “*Boomster*” or “*Doomster*” perspective when faced with environmental sustainability concerns. A Boomster perspective is an optimistic response in which people see the environmental crisis as a welcomed challenge of human ability and ingenuity; a threatened planet epitomizes humans’ ability to solve problems with sufficient technological, monetary and research resources. Conversely, Doomsters use a less optimistic approach to the environmental crisis, “[d]escribing the coming environmental hell in graphic detail, [scaring] their audience with dreadful prophecies, then promise salvation through conversion to a new ecological worldview,” (Koger & Winter, 2010, p. 21). This approach, while more popular, can be even less effective at creating sustainability as it leaves little hope—the problems are too big for those few willing to enact change.

Although neither perspective is “right,” the contrasting views can help us to understand others’ (and our own) thoughts and interactions with the environment.

This is consistent with humans’ propensity to act in a way that benefits the self over others. In social psychology, this is known as a social dilemma (Van Vugt, 2002). While individuals may not intentionally act against a group’s interest, when many individuals behave in the same way, this results in collective harm. Similarly, the Tragedy of the Commons (Hardin, 1968) proposes that persons acting independently and out of self-interest will eventually deplete a limited resource, even if that is not their intention. Earth has a number of limited resources, and given freedom to consume at will, human consumption and population will eventually exhaust those resources, leading to a social dilemma. Hardin’s seminal paper provides a basic and rational understanding of the impending threats to the environment’s sustainability from a biological and economic perspective. Humans freely seek to maximize personal gain (the positive component), but by doing so, it comes at a cost to others (the negative component). By doing so, everyone—including the one who initially gains—will eventually lose; exhausting resources benefits no one in the long run. As Hardin (1968) points out, “freedom in a commons brings ruin to all” (p. 1244).

In the context of environmental sustainability, if a person uses more than his or her share of the Earth’s resources (be it water, land, or other natural resources), there is less of that resource available for someone else. The tragedy becomes greater, however, when we consider the planet’s scarce and nonrenewable resources, such as water or fossil fuels. For example, a person may take a shower in his or her self-interest to clean her body, but using clean water to shower means that someone else may not have access to

that water for her own use—be it hygiene or survival. The dilemma is exacerbated by a growing global population (Bartlett, 1994; Brundtland, 1987) and ever-expanding consumption rates (Human Development Report, 1998). As Hardin (1998) notes:

The more the population exceeds the carrying capacity of the environment, the more freedoms must be given up. ... On the global scale, nations are abandoning not only the freedom of the seas, but the freedom of the atmosphere, which acts as a common sink for aerial garbage. Yet to come are many other restrictions as the world's population continues to grow. (p. 683)

To curtail the loss of freedom of use of the Earth's resources, we must be willing to change our current usage patterns. Oskamp (2000) purports that unless the primary sustainability threats are overcome, Earth will eventually be uninhabitable for humans. As such, psychologists should focus on efforts to help others adopt a more sustainable lifestyle through positive mechanisms: voluntary simplicity, reducing resource use through specific and concrete actions, providing clear behavioral norms, focusing technological advances toward pro-environmental goals, using organized group activity to encourage governments and corporations to reduce/prevent environmental damage, and emphasizing the superordinate goal of a habitable Earth for all nations and people.

### *Social cognition*

Our thoughts are noted as important determinants of behavior, but we must first understand how the brain processes information. Cognition refers to our thought processes, and within social psychology, we study cognitive elements as part of the social environment—the way in which information from one's social environment is

represented in the brain (Fiske & Taylor, 1991). Therefore, how we think about the environment can influence sustainability efforts—from how well we are able to estimate positive and negative environmental impacts, to cognitive biases leading us to over- or underestimate our use of a given resource. For example, if you ask a group of people to identify the reasons why they do or do not recycle, they will likely come up with a variety of responses. Those who do recycle will likely highlight the importance of saving resources and the negative impact of excess waste. People who do not recycle will also list a number of reasons, though they may focus more on convenience or degrading the negative impact of garbage. This provides valuable insight about the relationship between thoughts and behavior—if you believe that recycling benefits the Earth, you will likely recycle your plastic, aluminum, glass and cardboard waste. The opposite is also true—if you think that recycling is burdensome and inconvenient, you likely will not recycle. This process applies to any pro-environmental behavior or lack thereof. To understand behavior, we must also consider one's thought processes.

*The Power of the Self.* Within social psychology, we often consider the role of identity—a sense of oneself—and how that influences our thoughts, attitudes and behaviors. Identity has both personal and collective components; that is, who one thinks one is, is influenced by a personal identity (e.g., I am an environmentalist) and also a social identity (e.g., I belong to the campus sustainability committee). Oftentimes, one's personal and social identities overlap. Identity can also shape our relationship with the natural world, and therefore may also influence our environmental behaviors. For example, an ecological identity is defined as the experience of oneself as an integral part of the natural environment (Koger & Winter, 2010).

Clayton's (2003) environmental identity (EID) scale was developed to measure one's sense of self in relation to the natural environment—not simply as a reflection of attitudes and subsequent behavior, but also how we think about the environment, both good and bad; “that our immediate local actions can have global consequences, and that remote environmental threats are personally significant,” (Clayton, 2003, p. 61). The scale includes statements regarding a personal identity with the environment (e.g., “I think of myself as part of nature, not separate from it,” “I really enjoy camping and hiking outdoors”) and also a social identity with the environment (e.g., “I have a lot in common with environmentalists as a group”). Research has shown that individuals who see themselves as part of the natural environment—whose identity is tied to the environment—are more likely to engage in environmentally-friendly ways, participate in environmental groups, and believe the environmental movement is important (Dunlap & McCreight, 2008b).

*Socials beliefs and judgments.* One of the reasons people have a difficult time making decisions that promote environmental sustainability is because it is difficult to think about environmental impacts on a personal level (Lowenstein & Frederick, 1997). Regardless if environmental impacts are viewed as positive (e.g., recovering an endangered species from extinction or improving air quality) or negative (e.g., disappearing rain forests or toxic lakes), personal valuations of significance are difficult to make unless one has directly experienced such impacts. When thinking about environmental impacts, people are expected to make predictions about the consequences of their behavior for outcomes they may not have experienced themselves (Lowenstein & Frederick, 1997).

There are environmental impacts we can experience, though, and one way to do that is by increasing one's knowledge of use of a given environmental resource. People may not actively engage in pro-environmental action because they simply are not aware of how much of a resource they are using, such as gas, electricity or water. Therefore, increasing knowledge of use should help encourage people to reduce their use. Van Vugt & Samuelson (1999) tracked water use in a community during a drought. Households that were given a water meter used significantly less water than households that did not have water meters and thus were unaware of how much water they were using. In the same way, being aware of how much of a resource one is wasting should also lead to pro-environmental behavior. Although most people are aware that turning off lights, keeping their thermostats at a set temperature, and shutting off the water when brushing their teeth will help conserve resource use, they are often unaware of just how much more they can conserve. Aronson and his colleagues (Gonzales, Aronson & Costanzo, 1988) noted that by making energy loss vivid, energy auditor recommendations were much more likely to be implemented in homes. For example, when an auditor illustrated the collective impact of the cracks around and under doors in a home as "the equivalent of a hole the size and circumference of a basketball" (Gonzales, et al., 1988, p. 1054), homeowners were more likely to take measures to insulate their homes better, than if they had simply been given a list of recommendations to reduce their monthly energy bill. This benefit is twofold: energy conservation and lower monthly utility bills.

We may be overwhelmed by the information available as to how to help alleviate environmental problems—from which plastics can or cannot be recycled to reconsidering the impact of one's means of transportation to work every day. Cognitive biases may



inhibit our ability to make rational choices that support best practices for environmental sustainability. We will consider the availability heuristic, false consensus effect and uniqueness bias, and the coincidence effect.

For example, the availability heuristic states that people will overestimate the likelihood of an outcome based on how easily it comes to mind—how available something is in memory (Tversky & Kahneman, 1973). The availability heuristic may lead people to overestimate the risk of some environmental hazards over others, based on information that readily comes to mind. For example, Gardner and Stern (2002) found that people were more concerned about the environmental damage caused by oil spills, than the environmental hazards of global warming—even though the former is arguably much less likely and more limited in its effects. The authors suggest that this is likely due to the media coverage surrounding oil spills, combined with the lack of vivid personal experience seeing melting ice caps and polar bear extinction—effects often associated with global warming.

The false consensus effect and uniqueness bias can also lead to misjudgments about environmental impacts. The false consensus effect (Ross, Greene & House, 1977) is the tendency to believe that others in a group will respond in the same way as oneself. Conversely, the uniqueness bias holds that one will exaggerate his/her good, or positive, qualities and actions as rare, by comparison to others (Suls & Wan, 1987). In 1999, Princeton University enacted a temporary campus-wide shower ban due to a water shortage caused by a tropical storm. Monin & Norton (2003) found evidence of both the false consensus effect and uniqueness bias during and after the shower ban. During the ban, a number of students chose not to adhere to the ban, overestimating the likelihood

that other students would also engage in environmentally irresponsible behavior and defy the ban (false consensus). Once the ban was lifted, however, students who adhered to the ban and chose not to shower underestimated the prevalence of others' choice to also follow the ban (false uniqueness).

The coincidence effect may help us understand consumers' misguided judgments of "environmentally-friendly" goods, such as organic food. The coincidence effect refers to how people evaluate items as similar or dissimilar to each other (Kaplin & Medin, 1997); it shows that when making comparisons between two goods, people are more likely to highlight similarities between products, rather than differences, even if the products are more different than similar. Tanner & Jungbluth (2003) studied the coincidence effect in how people make judgments about the environmental quality of food (e.g., vegetables). The authors found that depending on how participants were asked to evaluate the vegetables, environmental friendliness was either overestimated or underestimated. For example, the participants may have focused on the agricultural practice of growing the vegetable (organic compared to industrial, or conventional, farming) and the packaging (i.e., in plastic wrapping or not), but failed to consider the country of origin, neglecting the environmental costs of bringing food from across the country (or world). According to the coincidence effect, similarity, even on a single dimension, stands out more than differences, when comparing items. As such, people would have a tendency to evaluate organic apples and bananas as having the same environmental "friendliness," without acknowledging the environmental impact of shipping bananas from Chile, compared to getting apples from Washington.

*Nonconscious processing.* Koger and Winter (2010) argue that one of the reasons why people fail to engage in pro-environmental behavior is because they are unaware that they are acting otherwise; that is, their behaviors occur unconsciously, and often without regard for the environment. Understanding that unconscious behaviors can lead to negative environmental impacts is an important step in reconciling behavior; in this way, humans need to make the unconscious conscious. For example, defense mechanisms can be used to protect oneself from the reality of a fragile environment (e.g., denial of global climate change), or allow us to rationalize our behaviors (e.g., due to expense of being pro-environmental, arguing a lack of knowledge of how to behave, etc.).

Opatow and Weiss (2000) propose that denial fosters moral exclusion and exclusionary perceptions about the situation, the other, and oneself in environmental conflicts. They identify three “symptoms of moral exclusion” including: denial of outcome severity, denial of stakeholder inclusion, and denial of self-involvement. The first symptom—denial of outcome severity—is a familiar one, as this occurs when one minimizes the severity of potentially aversive outcomes or situations. For example, one may adhere to the belief that “global warming” is nothing but a contrived notion, not an empirically supported phenomenon. The second symptom, denial of stakeholder inclusion, questions the legitimacy of other interested parties, often sparking between- and within-group conflict. An example of this might be discrediting a conflicting agency or stakeholder group as outsiders or extremists. The final symptom is the denial of one’s own behaviors as contributions to the overall problem. When we deny our own self-involvement, we may displace blame onto others, inaccurately undermine individual contributions, diffuse or displace responsibility, or make self-righteous comparisons. In

this way, we deny our own behaviors as part of the problem, which often inhibits the necessary action to an amenable solution. The article concludes with implications for theory and practice, noting the importance of simply becoming aware of the process of denial in an effort to “minimize environmental damage and foster environmental benefits for all” (Opotow & Weiss, 2000, p. 488).

Our cultural worldview, especially for those in the western hemisphere, may also be a factor in the sustainability crisis. The Dominant Social Paradigm (DSP; Pirages & Ehrlich, 1974) reflects a belief system that humans have a right to use the natural world for economic or social gain. Research demonstrates that people who hold this viewpoint are less likely to show concern about environmental problems (Dunlap & VanLiere, 1978) or engage in pro-environmental behaviors (Pahl, Harris, Todd, & Rutter, 2005). Cross-cultural research, however, suggests that not all global inhabitants share this belief system. Schultz, Unipan, and Gamba (2000) found that foreign-born Latino American students had higher New Ecological Paradigm scores (indicating greater pro-environmental attitudes) than U.S.-born students. The researchers also found an acculturation effect, such that the longer a foreign-born student had lived in the United States, the lower that person’s NEP score would be. Clearly, social and cultural values are important indicators of pro-environmental attitudes. Furthermore, Vikan, Camino, Biaggio, and Nordvik (2007), found that individuals in collectivist cultures are more likely to show greater endorsement of the NEP than individuals from individualistic cultures. This demonstrates that one’s likelihood to engage in pro-environmental behavior (or, conversely, behavior that threatens the sustainability of the planet), may be influenced by cultural belief systems.

*Behavior: How we act in the environment*

As most of the major environmental problems identified in the research are caused by human behavior, it stands to reason that changing human behavior would be an effective solution to fostering environmental sustainability. Social psychological research provides a number of examples from which we can base our predictions of whether people will act in either environmentally responsible or irresponsible ways. We will consider the role of social norms, knowledge of use, social comparison, economic incentives, and hypocrisy in encouraging environmentally-friendly behavior.

*Social norms.* Social norms serve as the unwritten rules of behavior. Research shows that both injunctive and descriptive norms serve as reminders for how people should act in a given situation (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Injunctive norms specify what behavior most people approve or disapprove of, whereas descriptive norms identify what most people do in a social setting, regardless of social sanctions. Norms can be used to influence environmentally-relevant behavior, such as littering (Cialdini, Reno, & Kallgren, 1990). In their study, Cialdini and colleagues found that implied social norms determined the conditions under which someone would be likely to litter. For example, when a space was highly littered, people were more likely to litter, and vice versa—people were less likely to litter in a non-littered environment. The most littering occurred when participants saw a model drop a piece of trash in a highly littered environment; the least littering occurred when participants saw a model drop a piece of trash in a clean (non-littered) environment (Cialdini, 2003).

Normative behavior can also help promote conservation in hotel guests (Goldstein, Cialdini, & Griskevicius, 2008). Researchers used signs in the bathroom of

hotel rooms to promote either social norms of expected behavior (e.g., “the majority of guests reuse their towels”) or the traditional message of environmental protection (e.g., “help save the environment”). By promoting the conservation behaviors of other group members in similar situations, hotel guests were more likely to adhere to social norms of reusing towels during their stay, compared to the industry-standard message. This finding is important because it shows that even when pro-environment behavior is encouraged (e.g., “help save the environment”), it may not be as effective without norms of socially expected behavior.

Correlational studies have found that social norms may predict recycling behavior. In communities with curbside recycling programs, the recycling containers serve as a reference for others as to what is considered appropriate behavior—a social norm for a given neighborhood (Oskamp, 1995). People may also look to others for socially acceptable behavior. Research has also shown that a household is more likely to recycle if their friends and neighbors recycle (Oskamp, Harrington, Edwards, Sherwood, Okuda, & Swanson, 1991).

There is concern, however, that the way in which descriptive and injunctive social norms are used could actually lead to unwanted or undesirable (in this context, anti-environment) behavior. In the 1970s and 1980s, the Keep America Beautiful campaign aired a public service announcement (PSA) about littering<sup>1</sup>. In the advertisement, actor “Iron Eyes Cody” portrays a Native American who paddles across a litter-strewn river onto shore, only to see a bag of trash throw out the window of a speeding car, landing at

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<sup>1</sup> For more information on the Keep America Beautiful campaign, including a video clip of the original “Iron Eyes Cody” public service announcement, please visit: [www.kab.org](http://www.kab.org).

his feet. As the camera pans from his feet to his face, a single tear rolls down his cheek, followed by the slogan, “People start pollution; people can stop it.” While the PSA won a number of awards for its creativity, psychologists were concerned with the mixed normative messages that were displayed (Cialdini, 2003).

The injunctive norm of the PSA was clear: the lone shed tear signified that littering is not a socially (and culturally) acceptable behavior. The descriptive norm was also clear, but not as keeping America beautiful. The presence of litter in the river, along the shoreline, and thrown out the window of a car all relayed the apparent descriptive norm: people *do* litter. It is important, therefore, when trying to use social norms to encourage pro-environmental behavior that injunctive and descriptive norms are consistent with each other, but even more so, that the injunctive norm is more salient than the descriptive norm (Cialdini, 2003).

*Attitudes and persuasion.* It is often assumed that attitudes and values precede behavior. For example, if you have a favorable attitude toward the Democratic presidential candidate, you will likely vote for that individual in the presidential election. If you like the taste of pizza, you are more likely to eat it. Research has garnered support for the “attitude-influences-behavior” belief in an environmental context. People with a general concern for the environment—representing a pro-environment attitude—will often exhibit pro-environment behaviors, most notably, recycling (McGuinness, Jones, & Cole, 1977). In several recycling studies, researchers found that one’s attitude toward recycling predicted recycling behavior (Gamba & Oskamp, 1994; McKenzie-Mohr & Oskamp, 1995). Those who believe more strongly in the benefits of recycling are more likely to be participants in a recycling program (Gamba & Oskamp, 1994). Oftentimes,

even a more general pro-environmental attitude is a significant predictor of recycling participation (McGuinness, Jones, & Cole, 1977). There are other domains in which our attitudes reflect our likelihood to engage in pro-environment behaviors, including our values and the things we like.

Our values are often consistent with our attitudes as well. In the early to mid-twentieth century, environmental proponents argued for the preservation of the natural wilderness (Leopold, 1949). Across time, however, the way in which these natural habitats have been “preserved” has varied. This likely reflects a change of values and attitudes about wildlife and the wilderness. Current research on people’s affective reactions show general ambivalence; for the reasons we like the wilderness (it represents a free and untamed life force), we are also intimidated by it (Koole & van den Berg, 2005; Van den Berg & ter Heijne, 2005). Bixler and Floyd (1997) conducted a research study where middle school students were asked to identify their attitudes and values—both relevant and irrelevant to the natural environment. They found that students who expressed a preference for modern conveniences also showed a preference for cultivated and manicured nature over an uninhibited wilderness. Although this research is helpful for understanding the relationship between values and attitudes toward the environment, the empirical research does not definitively support whether people’s non-positive values toward the environment are related to a willingness to act in pro-environmental ways.

The “attitude-behavior” relationship, however, cannot be generalized across all situations. Attitudes do not always predict behaviors. A discrepancy exists between our often anti-environment behavior, and the finding that people care a great deal about the environment and believe that the earth should not be degraded. This is known as the



“attitude-behavior gap.” For example, one study found that people’s attitudes toward recycling predicted recycling behavior but only when they did not possess a recycling bin (Guagnano, Stern & Dietz, 1995). Conversely, when people had a recycling bin, they participated in recycling, even if they did not have strong pro-environmental attitudes. This finding speaks to another distinction of the attitude-behavior gap: removing small barriers will increase desired behavior, even in the absence of strong concordant attitudes (Lewin, 1951).

*Affect: How we feel about the environment*

In 1982, B.F. Skinner publicly criticized the efforts of environmental groups and social activists to “save the world” (Skinner, 1987).<sup>2</sup> Skinner argued that instead of trying to guilt or shame people into being more environmentally conscious, groups should focus instead on the benefits of adopting a more eco-friendly lifestyle. By reinforcing positive outcomes, people’s attitudes and perceptions about the environment would change, thereby improving the likelihood of changed behaviors.

Still today, Skinner’s admonishment is true. Although it is important to understand how to promote environmentally sustainable behavior, oftentimes people simply will not engage in long-term behavior change. Without the proper motivation to act in a pro-environment way, people may choose to continue to engage in damaging behaviors. It is therefore imperative to consider how affect may influence behavior.

The way we are primed to think about environmental dangers, however, may also impact whether they behave in environmentally-friendly ways. This leads one to consider internal factors (specifically, emotion) that may lead one to engage in behavior that

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<sup>2</sup> Skinner’s speech was originally given as an address at the 1982 gathering of the American Psychological Association. It was published in 1987.

supports sustainability efforts or, at the very least, minimizes the damage done to the Earth. Theories of emotion can apply to individuals' pro-environmental behavior, and this is especially true when considering affective relationships with the environment (Chawla, 1998, 1999). Researchers argue that one's emotional reaction to the environment, particularly environmental degradation, is a strong predictor of engagement in pro-environmental behavior (Grob, 1991, as cited in Kollmuss & Agyeman, 2002). Arguably, not everyone experiences the same emotional reaction to threats to environmental sustainability, which leaves us to question the "what" and "why" of expressing concern for the environment. While this research does not seek to answer this very broad inquiry, it will examine how emotion affects one's likelihood to engage in pro-environmental behavior.

### *Emotion*

The experience of emotion is universal—from sadness and anger to joy and excitement (Ekman, 1994). Emotion is a state of feeling, but it encompasses physiological, cognitive and behavioral components (Solomon, 2008). For example, emotion can be a response to a situation—fear when exposed to a threat; it can motivate behavior—anger can motivate one to act aggressively; or it can be a goal in itself (Rathus, 2012).

Research shows that emotion can also have a significant, direct impact on judgment and choice (Loewenstein & Lerner, 2003). This finding is true whether the emotion arises organically from the situation (Damasio, 1994), or is experimentally induced (Wilson, Lisle, Schooler, Hodges, Klaaren, & LaFleur, 1993). All too often,

however, emotions are a potential source of biased judgment, particularly when experienced at the moment of decision making (Lowenstein & Lerner, 2003).

According to Damasio (1994), emotions can play an “advisory role” in decision making; people interpret emotions as having information that is used as input for decisions they face. This is best characterized by the affect-as-information hypothesis (Schwarz & Clore, 1983), which proposes that people use their present feelings to guide evaluative judgments. For example, if a decision maker is experiencing positive feelings, it is likely that their evaluation of options is relatively positive, and vice versa for negative feelings. In their original research study, Schwarz and Clore (1983) asked participants either on a sunny or cloudy day to rate their life satisfaction. They found that people reported greater life satisfaction on a sunny, rather than cloudy, day. Other research has also demonstrated this impact; for example, affect and emotion influence evaluative judgments of political figures (Forgas & Moylan, 1987) and consumer choices (Han, Lerner, & Keltner, 2007).

The *appraisal tendency framework* seeks to explain the effects of emotion on judgment and decision making (Keltner & Lerner, 2009). Under this framework, emotions influence judgments in a specific manner—that is, in a way that is consistent with the emotion’s underlying appraisal tendency, but only in domains related to the appraisal (Keltner & Lerner, 2009). For example, fear will influence judgments of certainty and risk, while anger will influence judgments of blame and fairness. A number of research studies lend support for this framework. Keltner, Ellsworth, and Edwards (1993) found that people who felt sad were more likely to attribute ambiguous events to situational causes, compared to people who felt angry, who were likely to attribute the

same events to actions of others. Fear can amplify the expectation of pessimistic life outcomes (Lerner, Gonzales, Small, & Fischhoff, 2003), and those who feel anxious are more likely to prefer uncertainty-reducing options, compared to sad decision-makers, who showed a preference for reward-seeking options (Raghunathan & Pham, 1999).

Like negative emotions, positive emotions can also influence judgment and decision making. Isen (1987) found that people in positive moods tend to be more creative and think in more flexible ways. People induced to feel happiness were more likely to find creative solutions to novel problems, produce unusual associations to words, or categorize objects in inclusive or novel ways (Isen, 1987). These findings serve as the theoretical framework for Fredrickson (1998)'s broaden and build theory of positive emotions. This theory espouses that positive emotions broaden one's momentary thought-action repertoires, which then serve to build their personal resources—from physical and intellectual resources, to social and psychological resources (Fredrickson, 2001). Contrasted with negative emotions' limited specific action tendencies (e.g., a fight or flight response to fear), positive emotions appear to broaden individuals' thought and action possibilities, while also building physical, intellectual, and social resources (Fredrickson, 1998).

*Emotion and the environment.* Taken together, the experience of negative or positive emotions, may significantly impact not only people's experiences with the environment, but also their tendency to engage in pro-environmental behavior. If one experiences negative emotions, he or she may be less likely to engage in pro-environmental behavior, feeling helpless to engage in meaningful behavior change or to deny the need to change behavior in the first place. Conversely, if one experiences

broader action possibilities by virtue of positive emotions, he or she may be more open to changing his or her behavior, and willing to do so. While research specifically looking at the impact of emotion on pro-environmental behavior change is scant, the role of emotions in environmental concern has been addressed.

Research has identified a number of emotional and affective components of pro-environment behavior (Stern, 2000). For example, Kals, Schumacher, and Montada (1999) developed an “emotional affinity toward nature” scale to identify a construct by which people are connected to nature and expressive positive feelings with nature. The researchers argue that individuals often engage in pro-environmental behavior because they are motivated by emotion; for example, they may experience guilt about their own environmental “sins,” hold resentment for others’ polluting behavior, or express fear over experiencing health problems created by pollution (Kals, 1996a, 1996b; Kals & Montada, 1994, as cited in Kals et al., 1999). Furthermore, research shows that an emotional bond with nature often serves as a motive to engage in behavior that protects nature (Fisherlehner, 1993, as cited in Kals et al., 1999). To this end, the emotional affinity toward nature scale was developed to assess one’s emotional connection with nature (e.g., “I have a deep feeling of love toward nature;” “I am indignant about the unnecessary consumption of natural resources by many citizens”), and its influence on behavior (“I am willing to recruit support in public for organizations that fight for the protection of natural landscapes;” “I am willing to take steps in my own household for the protection of natural resources”). They found that individuals who score high on this measure are more likely to behave in a way that protects nature (Kals et al., 1999). Individuals may also express a sense of connectedness to the environment, reflecting an

inclusion of nature to one's cognitive representation of self (Schultz, 2002). This cognitive component is related to commitment, or one's willingness to engage in pro-environmental behavior (Schultz, 2002).

Research has demonstrated the effectiveness of empathy and perspective-taking in influencing environmental concern (Schultz, 2000, 2001). Based on Davis' (1996) research that empathy and perspective-taking expands one's boundary of self to include others, Schultz (2000) found that experimentally-induced perspective taking produced increases in biospheric environmental concerns. Similarly, Sevilliano, Aragones, and Schultz (2007) found that empathy and perspective-taking of a harmed animal (e.g., a bird covered in oil) led participants to feel more global concern for environmental problems. Although these studies did not include a measure of pro-environmental behavior, the findings suggest that we may be more likely to act in pro-environmental ways if the impact directly affects us, or other living beings. This is consistent with research by Manzo and Weinstein (1987), who found that people who have been harmed by some environmental problem are more likely to be active members of an environmental organization. More recent research confirms this finding: our emotional reaction to environmental problems is stronger when we directly experience the degradation (Chawla, 1999; Newhouse, 1991). These effects are likely due to the notion that environmental harms produce distress, which lead us to psychological and behavioral responses aimed at relieving us from negative feelings or emotions (e.g., anger or sadness; Kollmuss & Agyeman, 2002).

Unfortunately, one's psychological response to experiencing environmental problems may not always lead to pro-environmental behavior. In fact, experiencing

environmental problems may actually prevent someone from engaging in behaviors that protect the environment. Kollmuss and Agyeman (2002) hypothesize that emotional reactions may lead to defense mechanisms such as denial (refusing to accept reality of a situation; e.g., the belief that global warming does not exist) and apathy (feeling that there is little one can do to change the situation; Hines, Hungerford, & Tomera, 1987). People may also engage in rational distancing, whereby they have created psychological distance from environmental problems by removing any personal sense of emotion from the problem (Kollmuss & Agyeman, 2002). This may also reduce one's internal motivation to engage in pro-environmental behavior.

For those who have not experienced environmental problems, there are still a number of psychological "roadblocks" that impede the likelihood that one will participate in environmentally-sustainable behavior. One of the reasons people have a difficult time making decisions that promote environmental sustainability is because it is difficult to think about environmental impacts on a personal level (Lowenstein & Frederick, 1997). Regardless if environmental impacts are viewed as positive (e.g., recovering an endangered species from extinction or improving air quality) or negative (e.g., disappearing rain forests or toxic lakes), personal valuations of significance are difficult to make unless one has directly experienced such impacts (see above). Furthermore, people often lack knowledge regarding the causes and consequences of environmental dangers, which may lead to emotional non-involvement (Hines, et al., 1987; Kollmuss & Agyeman, 2002), likely affecting our willingness to engage in pro-environmental behavior. Sivek and Hungerford (1990) also found that knowledge contributes to one believing that he or she has the necessary skills required for action. For example, if an

individual knows that a programmable thermostat can help to reduce energy use, this knowledge may have little effect (and thus, benefit) if the individual does not know how to properly install and set the thermostat.

Although there may be a number of internal factors that inhibit pro-environmental behavior, it is important to consider how we can use emotion to encourage this type of behavior. While we may have little control over which emotions people organically feel when exposed to environmental degradation, we may be able to induce specific emotions in a way that fosters pro-environmental behavior.

Rozin, Markwith, and Stoess (1997) argue that one way in which emotion can influence environmentally-relevant behavior is by converting one's preferences into a moral choice—in effect, making a behavior right or wrong. Doing so increases the likelihood that the action is internalized, thereby invoking a greater emotional response and more global support. In their study, Rozin and colleagues (1997) surveyed a number of vegetarians regarding their choice to not consume animal flesh. They found that people tended to be vegetarian for either moral or health reasons. Moral vegetarians not only identified more reasons to avoid meat, they were also far more likely to find meat disgusting (a strong moral emotion) and avoid a wider range of animal products, compared to health vegetarians. This finding implies that if people engage in environmentally-relevant behavior because they believe it is a moral issue or are revolted by the impact, they are more likely to be committed to the behavior, and possibly engage in other environmentally-relevant behaviors.

Emotion, therefore, can affect our primary life motives, including the motive for food, and what types of food one chooses to eat (or not). Fox and Ward (2007) found that



individuals' initial motivators to becoming a vegetarian are often grounded in health incentives and for the ethical treatment of animals. Over time, however, one's motivations change and begin to include concerns for environmental sustainability which, as Rozin et al. (1997) found, often translate to other areas of behavior, not just food choice. For example, voluntary simplicity is often adopted for both emotional and ethical reasons. Voluntary simplicity is the notion that people will intentionally and significantly reduce their possession and consumption of material goods (e.g., owning 100 items or less). Much like the choice to be a vegetarian, Degenhardt (2002) found that adopting a more sustainable life is motivated by emotional consternation regarding environmental degradation and social inequality. Still, others may identify a sense of ecological social responsibility and thus commit to a more simplistic lifestyle (Huenke, 2005).

The literature on social thinking purports that individuals can be persuaded to change their thoughts or actions by inducing specific moods or emotion. This is why marketers and advertising firms aim to put consumers in a good mood when they are shopping—they know that people in a positive mood are less likely to rely on the central route to persuasion (Gardner, 1985; Park & Banaji, 2000). People who are in a good mood strive to maintain that internal consistency and therefore generally only pay attention to peripheral cues from an advertisement. Thus, these people may be more likely to purchase a product without consciously processing whether the product is something they need or will use.

Advertisers may also use negative emotions to persuade people to change their behavior, particularly if that behavior has dangerous or aversive consequences. Fear is a strong motivator, and it may change one's behavior away from a potentially negative

outcome. This is exemplified by campaigns to encourage adolescents to avoid cigarettes or other illicit drug use, or to encourage young adults to engage in safe sex practices. These behaviors have significant, aversive health outcomes. For example, the younger a person begins smoking, the chances of developing lung cancer increase dramatically. Recent campaigns aimed at reducing methamphetamine use tout the dangers of physical deformities after prolonged use. Unsafe sex practices also carry a number of heightened risks and potentially negative consequences, including unplanned pregnancy, sexually transmitted infections, and incurable diseases like AIDS. By focusing on the negative consequences associated with questionable health behaviors, advertising campaigns are hoping to instill a sense of fear such that an individual will not engage in such risky behaviors and thereby avoid the potential harms.

But do these scare tactics work? Research shows that it depends—on the individual, the amount of fear invoked, and whether the campaign provides helpful information on how to avoid the potentially aversive outcomes. Oftentimes, the more fear invoked, the more vulnerable people feel, increasing the likelihood that they will respond (de Hoog, Stroebe, & de Wit, 2007; Leventhal, 1970; Robberson & Rogers, 1988). For example, Ruiter, Abraham, and Kok (2001) found that women who were warned of the dire risks of not being screened for breast cancer were more likely to obtain a mammogram, than women who were simply informed of the benefits of mammography. Farrelly and colleagues (2002, 2008) found that a dramatic and edgy “anti-smoking” advertisement (e.g., the American Legacy Foundation’s “truth” campaign) was more effective at reducing teens’ likelihood to smoke, compared to a more “cerebral” advertisement (e.g., the Phillip Morris Company’s, “Think. Don’t Smoke.” campaign). In

general, fear-based appeals seem to be more effective when trying to prevent an aversive outcome (e.g., cancer), rather than promoting a good outcome (e.g., improved fitness; Lee & Aaker, 2004).

Fear-framed messages, however, are not always effective. Janis and Feshbach's (1953) research on encouraging students to practice good oral hygiene produced mixed results when fear was induced. Participants were randomly assigned to either a high-, moderate- or low-fear condition. In each condition, participants viewed a 20-minute recorded lecture about proper dental hygiene; the only difference between the three lectures was the amount of fear present with the recommendations for maintaining good oral hygiene. One week prior to participation, individuals were contacted about their current dental hygiene practices; this served as the baseline (or, control) measure of each participant's dental hygiene practices. Participants in the high-fear condition viewed a very graphic and fear-arousing lecture highlighting the negative consequences of poor dental hygiene, such as cavities, progressive gum disease, and infections. Of particular note, the high-fear lecture also used explicit personal threat-references (i.e., "This could happen to you!"). Participants in the moderate-fear condition viewed a similar lecture that contained some of the same information as the high-fear appeal, but presented the information in a milder and more factual manner (e.g., it did not use personal threat-references and contained less frequent mention of negative consequences). The lecture for those in the low-fear appeal did not have any of the fear-arousing material, but instead was replaced with neutral information dealing with the growth and functions of teeth. As expected, the participants in the high-fear conditions reported experiencing the highest amount of fear and worry about their teeth and potential risks of poor dental hygiene,

while those in the low-fear condition reported the lowest concern for improper care of their teeth. Surprisingly, however, the high-fear participants were the least likely to change their oral hygiene behaviors, whereas the low-fear participants were the most likely to change their hygiene practices, by incorporating the recommendations given in the video lecture. Furthermore, nearly one-fifth of the participants in the low-fear condition had scheduled a dental check-up one week following the experiment, compared to only 10% of the participants in the high-fear condition. The researchers purport that the high-fear appeal was too strong and evoked some form of interference, thereby reducing the effectiveness of the recommendations for improved dental hygiene (Janis & Feshbach, 1953). This study shows that fear-based appeals may actually backfire, inhibiting individuals from engaging in the desired, beneficial behavior.

Another danger of using high-fear appeals is that it may lead people to deny their risk of a potentially negative outcome. For example, Morris and Swann (1996) were interested in whether fear-based appeals would lead students to avoid risky sex practices. In this study, researchers used a high- and low-fear paradigm to show the risks of contracting HIV through risky sex behaviors. After answering a number of questions about their own sex behaviors, participants were assigned to either the low- or high-fear condition. In the high-fear condition, participants watched a film which showed interviews with young adults (the same age as the participants in the study) who had contracted HIV through unprotected sex. Although the film provided viewers with information on how to protect themselves from contracting HIV, the filmed interviews were designed specifically to arouse a great amount of fear among the participants by illustrating the very real and negative effects of living with HIV. In the low-fear

condition, participants were given a pamphlet about HIV, which (like the film interviews) included a list of protections people could employ to reduce their risk of contracting the virus. Similar to the dental hygiene study, participants in the high-fear condition expressed a higher amount of fear about HIV than participants in the low-fear condition, but the participants in the low-fear condition were more likely to change their own sex behaviors than participants in the high-fear condition. The researchers argue that sexually active participants in the high-fear condition employed psychological denial regarding their risk of contracting HIV (e.g., they had engaged in risky sex practices but had not yet contracted HIV), and thus were less likely to change their behaviors. Interestingly, there was one group of students who were significantly influenced by the high-fear condition: those who had never had sexual intercourse. For participants who had never had sex, the high-fear condition was especially influential in their decisions regarding safe-sex practice; these participants indicated less willingness to engage in risky sexual behavior more so than all other participants across both conditions. It is likely that the virgin participants already had constructed for themselves a number of reasons not to engage in sexual practices, so the fear of contracting HIV through sexual intercourse strengthened their decision. These findings, combined with the outcomes from the dental hygiene study, suggest that fear-based messages are most effective (e.g., promote the desired behavior) if they lead one to fear a dire outcome or threatened event, but also if they provide individuals with a solution they are capable of implementing (DeVos-Comby & Salovey, 2002; Ruiter et al., 2001).

How do dental hygiene and safe sex relate to the environment? The use of negative emotions to change people's behaviors is often applied to activities which bear

harmful health consequences for the individual. Environmental concerns, just like unsafe sex, poor dental hygiene, and drug use, have been linked with a number of potentially aversive outcomes for the Earth and its inhabitants.

### **Study Overview and Hypotheses**

The present research proposed to study the impact of viewing positive or negative emotion-arousing appeals on individuals' attitudes and pro-environment behaviors.

H1: It is hypothesized that, similar to the research on dental hygiene and safe sex practices, a negatively-framed appeal will have less of an impact on participants' pro-environmental attitudes and behaviors than a positively-framed appeal. It is anticipated that a negatively-framed appeal will influence viewers' emotions such that they will express heightened fear, worry and empathy for the Earth and its inhabitants, but they will not be effective at influencing an individual's immediate or long-term behaviors. This is consistent with Janis and Feshbach (1953)'s research on the effect of anxiety-arousing communications. When individuals are confronted with communication that arouses feelings of anxiety and fear, those receiving the message may fail to pay attention to the message, react to the unpleasant experience by becoming aggressive, or employ defense avoidances to reduce the negative emotional tension (Janis & Feshbach, 1953). This is likely because the emotional experience of fear is connected with a behavioral tendency to avoid or escape a particular situation (Rathus, 2012). Conversely, messages are more persuasive when associated with good feelings (Dabbs & Janis, 1965). Therefore, replacing the negative emotion-arousing stimuli with positive emotion espousing stimuli should lead individuals to be in a better mood, and thus more receptive of the suggested pro-environment attitude and behavior changes.

This study will also measure the impact of information on how to be more sustainable, by providing specific examples of pro-environmental behavior, and tips on how to reduce one's impact on the environment. Previous research shows that the presence or absence of this type of information can influence the impact of emotion-based appeals on whether an individual will engage in behavior change (DeVos-Comby & Salovey, 2002; Ruiter et al., 2001).

H2: Consistent with the research, it is hypothesized that participants who receive this type of information will be more likely to engage in pro-environmental behavior. Knowledge is often cited as a barrier to behavior change (Kollmuss & Aygeman, 2002) and thus may be an important predictor of pro-environmental behavior change.

The effect of positive or negative emotional arousal on pro-environmental behavior change may be influenced by the presence or absence of information on how to be more sustainable. Although there is not a specific hypothesis to predict this relationship between the two independent variables, an interaction term is included in the model.

This study will use three environment-related scales to measure participants' pro-environmental attitudes: the Environmental Identity (EID) scale, the New Environmental Paradigm (NEP), and the Environmental Connectivity Scale (ECS) scale. The next two hypotheses relate to interactions between these individual difference measures and the emotion manipulation.

H3: First, it is hypothesized that participants who score high in EID, NEP, and ECS will be more influenced by the negative emotion appeal, such that they will show a greater difference in their behavioral intentions and follow up pro-environmental

behaviors. Conversely, those with low scores on the EID, NEP, and ECS will be more influenced by the positive emotion appeal, and will show greater changes in both predicted and long-term pro-environmental behaviors when exposed to the positive emotion condition, compared to the negative emotion condition.

Next, as noted previously, empathy increases concern for the environment, and thus may also influence pro-environmental behavior. In this study, the Interpersonal Reactivity Index (IRI; Davis, 1983) is used to measure participants' dispositional empathy.

H4: It is hypothesized that participants who score high on the empathy measure will be more influenced by the negative emotion appeal than the positive emotion appeal such that they will display more changes in pro-environmental behaviors from the initial assessment to the follow up study. By contrast, participants low on the empathy measure will be more influenced by the positive emotion appeal, and show changes in pro-environmental behavior only after viewing the negative emotion appeal.

Participants' current pro-environmental behaviors will be measured through a calculated ecological footprint (EF) score. The impact of negative or positive emotions may vary by participants' EF score (e.g., those who engage in more pro-environmental behaviors will be more influenced by the negative emotion appeal than the positive emotion appeal), but scores on the EF may also influence how much change a participant is able and willing to engage in for future behaviors. As such, ecological footprint scores are used as a covariate in the data analysis strategy to minimize the effect it may unduly have on the dependent variable measures.



## CHAPTER II

### METHOD

#### Participants

Both a student sample and a community sample were recruited for participation in this study. Student participants were recruited through the University of Nebraska-Lincoln's Psychology department research pool (Experimatrix), which allows students to receive extra credit for their participation in research studies. The community sample was recruited through Amazon's MechanicalTurk, which allows 'workers' from around the world to participate in "Human Intelligence Tests" (HITs) for payment. Community participants received \$2.00 in compensation for participation in this two-part study. In total, 249 participants (184 community participants; 65 student participants) completed Phase 1 of this study. The study sample included 120 males (48.20%, 99 of whom were community participants, 21 student participants) and 125 females (50.20%; 81 of whom were community participants, 44 student participants); four community participants (1.60%) did not disclose their gender. The average participant was about 30-years-old ( $M = 29.32$ ,  $SD = 11.14$ , range = 18-69).

#### Design, Procedure and Measures

All participants completed their participation online, using Qualtrics Survey Software©. The first survey (Phase 1) was available from March 22, 2013 through March 31, 2013; this survey included the primary study manipulations and baseline measures of pro-environmental attitudes and behaviors. The second, follow-up survey (Phase 2) was sent to participants to complete during the week of April 15<sup>th</sup>-19<sup>th</sup>, 2013. This second

survey was designed to assess differences in pro-environmental attitudes and behaviors over time (an interval of between 3 weeks and one month).

The experiment measured the effects of emotion (positive, negative, or none—the control condition) and information (present v. absent) in a standard communication of pro-environmental behavior. Thus the design is a 3 x 2 between-groups design, with several individual difference measures treated as additional independent variables. The influence of the emotion-arousing material and information on how to be more sustainable was measured through a series of questionnaires that provided data on emotional reactions to the communication, and changes in pro-environmental beliefs, attitudes, and behaviors.

**Emotion (Pre-Video Measure).** To measure the participants' current emotional state (prior to any study measures or variable manipulations), participants were asked to use a sliding scale gauge to indicate their present mood (on a scale from 1-5, where 1 = very negative, and 5 = very positive). This was used in place of the PANAS-X measure, as pre-testing of the study measures showed that participants were less likely to complete the emotion post-measure, indicating that they thought it was a redundant exercise (i.e., they had already completed it as a pre-measure). In general, participants reported feeling fairly positive at the start of the study ( $M = 4.12$ ,  $SD = 0.77$ ). Nearly half of the respondents ( $N = 121$ , 48.60%) reported feeling “positive,” and another third ( $N = 74$ , 29.70%) reported feeling “very positive.” No participants reported feeling “very negative,” although a few reported feeling “negative” ( $N = 9$ , 3.60%), and 29 reported feeling “neutral,” neither positive nor negative ( $N = 29$  11.60%). Student participants indicated feeling significantly more “neutral” ( $M = 3.83$ ,  $SD = 0.90$ ) than community

sample participants, who indicated a more “positive” general mood ( $M = 4.12$ ,  $SD = 0.69$ ;  $F(1, 231) = 11.45$ ,  $p = 0.001$ ), however, pre-measures of mood did not differ based on manipulated emotion. There was no significant difference between participants’ pre-measure of mood for those in the neutral video condition ( $M = 3.99$ ,  $SD = 0.80$ ), the negative video condition ( $M = 4.23$ ,  $SD = 0.72$ ), or the positive video condition ( $M = 4.09$ ,  $SD = 0.79$ ;  $F(2, 230) = 2.17$ ,  $p = 0.12$ ).

**Environmental Attitudes and Empathy.** Descriptive data on the individual difference measures are shown in Table 1. Next, participants completed the Environmental Identity Scale (EID), to determine the degree to which an individual views the environment as part of his/her identity (Clayton, 2003). The scale is comprised of twenty-eight statements which the participants rated from strongly agree to strongly disagree (on a 5-ptpoint scale) according to their own views (Clayton, 2003). Scores on this measure range from a minimum score of 28.00 to a maximum score of 140.00. The EID has demonstrated good internal reliability, with Cronbach’s alpha being 0.90 or higher (Clayton, 2003). In the current study, the Cronbach alpha coefficient was 0.92. Participants in this study scored an average of 98.60 ( $SD = 16.02$ ), with a range from 42.00 (low identification) to 139.00 (high identification). A one-way analysis of variance was conducted to determine whether there were differences on EID scores for the two samples. Community participants exhibited statistically significant higher EID scores ( $M = 102.08$ ,  $SD = 15.19$ ) than student participants ( $M = 88.08$ ,  $SD = 13.78$ ,  $F(1, 235) = 39.35$ ,  $p < 0.001$ ).

All participants then completed the New Ecological Paradigm, or NEP, which measures an individual’s perspective on the relationship between humans and nature

(Dunlap, Van Liere, Mertig, & Jones, 2000). Like the EID, the NEP asks participants to rate their environmental attitudes on a 5-point Likert-scale, where higher scores indicate a greater acceptance of nature as part of the self. The scores on this measure can range from 15.00-75.00 (a total of 15 items). The NEP has demonstrated strong, internal consistency with a Cronbach alpha coefficient of 0.83 (Dunlap, Van Liere, Mertig, & Jones, 2000). In this study, the Cronbach alpha coefficient was 0.81. Participants in this study scored an average of 52.15 ( $SD = 8.97$ ), indicating a relatively high acceptance of the belief that humans are a part of, not separate from, nature. Participant scores ranged from 25.00 to 73.00. There were no statistically significant differences on the NEP score between community participants ( $M = 52.57$ ,  $SD = 9.20$ ) and student participants ( $M = 50.95$ ,  $SD = 8.21$ ,  $F(1, 244) = 1.54$ ,  $p = 0.22$ ).

Next, the Environmental Connectivity Scale (ECS) measured the extent to which respondents feel a sense of connection with their natural surroundings (Dutcher, Finley, LuLoff, & Johnson, 2007). High scores on this scale indicate higher levels of perceived interconnectedness with nature. The scale consists of four items, rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), with an available score between 4.00 and 20.00. The scale demonstrated moderate internal consistency with a Cronbach alpha coefficient of 0.62, which is somewhat lower than other research (Cronbach alpha coefficient = 0.72; Dutcher, Finley, LuLoff, & Johnson, 2007). Participants in this study scored an average of 14.26 ( $SD = 3.03$ ), with a range of scores from 5.00 to 20.00. A one-way analysis of variance was conducted to determine whether there were differences in ECS scores for the two samples. Community participants

exhibited statistically significant higher ECS scores ( $M = 14.72$ ,  $SD = 2.98$ ) than student participants ( $M = 12.88$ ,  $SD = 2.79$ ,  $F(1, 232) = 17.36$ ,  $p < 0.001$ ).

The relationship among the three environmental attitudes scales (as measured by the EID, NEP, and ECS) was investigated using Pearson product-moment correlation coefficients. There was a moderate, positive correlation between the EID and the NEP ( $r = 0.28$ ,  $p < 0.001$ ,  $N = 234$ ); a strong, correlation between the EID and the ECS ( $r = 0.58$ ,  $p < 0.001$ ,  $N = 223$ ); and a moderate, positive correlation between the NEP and the ECS ( $r = 0.38$ ,  $p < 0.001$ ,  $N = 232$ ). There were no statistical differences between the community sample and the student sample on these relationships.

Participants then completed the Interpersonal Reactivity Index (Davis, 1983), a measure of empathy and perspective-taking. This scale includes 28 items, which are rated on 5-point Likert scale, where 1 = does not at all describe me well, 5 = describes me very well. The IRI is a multi-dimensional self-report measure of dispositional empathy four different seven-item subscales: perspective taking (PT), fantasy scale (FS), empathic concern (EC), and personal distress (PD). Each subscale includes 7 items and total scores for each subscale are calculated from those items. The IRI has been extensively validated in previous studies, with internal reliability ratings ranging from 0.71 to 0.77 (Davis, 1980). In our sample, Cronbach's alpha was 0.80 for the overall scale. Higher scores on this scale indicate higher levels of empathy. Participants in this study demonstrated average empathy scores on each of the four subscales: PT ( $M = 18.08$ ,  $SD = 4.38$ ), FS ( $M = 17.58$ ,  $SD = 4.94$ ), EC ( $M = 17.58$ ,  $SD = 4.94$ ), and PD ( $M = 12.31$ ,  $SD = 4.68$ ), with an average overall empathy score of 67.25 ( $SD = 11.60$ , range = 24.00-101.00). There were no statistically significant differences between community sample participants and

student sample participants on the four subscales: PT ( $F(1, 240) = 0.08, p = 0.78$ ), FS ( $F(1, 244) = 0.10, p = 0.75$ ), EC ( $F(1, 243) = 3.32, p = 0.07$ ), and PD ( $F(1, 239) = 1.32, p = 0.25$ ). Further, community sample participants displayed similar scores on the overall IRI scale ( $M = 66.95, SD = 11.77$ ) as student sample participants ( $M = 68.10, SD = 11.14, F(1, 230) = 0.43, p = 0.51$ )

Davis (1983) has identified gender differences in participants' scores on each of the subscales; in general, women tend to demonstrate higher scores of empathy compared to males. These gender differences were confirmed in the present study. Women exhibited higher scores on each of the scales, except for the personal distress (PD) scale ( $F(1, 236) = 0.68, p = 0.41$ ). Women were more empathetic than men on the PT subscale ( $F(1, 237) = 4.76, p = 0.03$ ), the FS subscale ( $F(1, 241) = 4.54, p = 0.03$ ), and the EC subscale ( $F(1, 240) = 20.97, p < 0.001$ ), as well as overall empathy ( $F(1, 227) = 11.26, p < 0.001$ ).

Table 1

*Total Scores Possible, Scale Reliability, and Means and Standard Deviations for Each Sample on Individual Difference Measures in the Present Study*

| Measure | Scores Possible | Reliability ( $\alpha$ ) | Community      | Student       |
|---------|-----------------|--------------------------|----------------|---------------|
|         |                 |                          | Sample         | Sample        |
|         |                 |                          | $M (SD)$       | $M (SD)$      |
| EID*    | 28.00-140.11    | 0.92                     | 102.08 (15.19) | 88.08 (13.78) |
| NEP     | 15.00-75.00     | 0.81                     | 52.57 (9.20)   | 50.95 (8.21)  |
| ECS*    | 4.00-20.00      | 0.62                     | 14.72 (2.98)   | 12.88 (2.79)  |
| IRI     | 28.00-140.00    | 0.80                     | 66.95 (11.77)  | 68.10 (11.14) |

|                           |               |      |                 |                     |
|---------------------------|---------------|------|-----------------|---------------------|
| EF*                       | 40.00-1630.00 | 0.57 | 740.39 (288.59) | 1096.42<br>(267.21) |
| Environmental<br>Concern* | 1.00-7.00     | --   | 5.87 (1.00)     | 5.05 (1.09)         |

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*Note. Mean scores are significantly different between the two samples (\* $p < 0.001$ ).*

**Current Pro-environmental Behaviors.** Following the previous measures, participants were asked questions about their current environmental behaviors, such as how much the individual recycles, drives an automobile, or purchases organic goods and products. Pro-environmental behavior items were taken from a number of “ecological footprint” tools (readily found online, the current study used items from [www.myfootprint.org](http://www.myfootprint.org)), which calculate one’s use of the Earth’s resources based on the area of land and ocean required to support an individual’s consumption of food, good, services, housing, and energy. Lower scores on an ecological footprint scale indicate more pro-environmental (more sustainable) behavior, whereas higher scores indicate less pro-environmental (less sustainable) behavior. Ecological footprint scores are continually revised and methods to measure scores are constantly evolving, so an average score on this measure is not widely available. Furthermore, the current study did not include all possible questions available from different ecological footprint tools, so comparisons cannot be drawn between the present sample and statistics available. The average score for participants in this study was 831.98 ( $SD = 322.86$ ,  $range = 40.00-1630.00$ ,  $\alpha = 0.57$ ).

The relationship among the environmental attitudes scales (the EID, NEP, and ECS) and empathy (the IRI), and scores on the ecological footprint (EF) was investigated using Pearson product-moment coefficients (see Table 2). There was a moderate,

negative correlation between the EF and EID ( $r = -0.49$ ,  $N = 229$ ,  $p < 0.01$ ), and a moderate, negative correlation between the EF and the ECS ( $r = -0.34$ ,  $N = 228$ ,  $p < 0.01$ ), and a negative correlation between the EF and NEP ( $r = -0.14$ ,  $N = 239$ ,  $p < 0.05$ ), with higher scores on the EID, ECS, and NEP associated with lower scores on the EF. There was not a significant correlation between the EF and the IRI ( $r = -0.06$ ,  $N = 226$ ,  $p = 0.39$ ). Table 2 displays the correlation matrix for sample participants on the empathy scale and environmental attitude and behavior scales.

Table 2

*Correlation Matrix for Participants on the Relationships between Environmental Attitudes, Environmental Behaviors, and Empathy*

|     | EID | NEP   | ECS   | IRI   | EF      |
|-----|-----|-------|-------|-------|---------|
| EID |     | 0.28* | 0.58* | 0.22* | -0.49*  |
| NEP |     |       | 0.38* | 0.29* | -0.14** |
| ECS |     |       |       | 0.45* | -0.34*  |
| IRI |     |       |       |       | -0.06   |

*Note.* \* $p < 0.001$ , \*\* $p < 0.05$ .

**Video Manipulations.** Following completion of the environmental attitude and behavior measures, the participant viewed one of six randomly assigned 3-minute public service announcement (PSA)-like video clips. The videos were designed to manipulate: the effect of emotion (positive, negative, or neutral), and information (present or absent). All six videos presented information about the impact of humans on the environment, but they varied with respect to the emotion-arousing material presented, as well as the



presence or absence of information related to how humans can minimize their impact on the environment.

The negative emotion appeal emphasized the consequences of humans' use and abuse of the natural environment and living beings that are associated with unsustainable behavior and environmental degradation. The video opens with a quote from satirical comedian George Carlin about the impact of humans on the environment reading, "Oh Beautiful for smoggy skies, insecticided grain; for strip-mined mountain's majesty above the asphalt plain. America, America, man sheds his waste on thee; and hides the pines with billboard signs, from sea to oily sea." The words appeared in white on a plain, black background. The message was presented for 10 seconds. The video then depicts a series of 25 images (played for 3 seconds each) that depict the major impacts and consequences of unsustainable behavior and climate change. For example, there are pictures of severe weather (hurricanes, tsunamis, wildfires, etc.), impacts of drought on people and animals, the rising spread of disease, animals that are killed for human profit (e.g., slaughter, seals that are clubbed for fur, elephants hunted for their tusks), smog and extreme pollution, and the melting polar ice caps. The video is intended to arouse negative emotions such as fear, guilt, sadness, worry and anxiety, and distress. At the end of the video, a picture of the Earth from outer space is presented, followed by this Ancient Indian Proverb, "We do not inherit the Earth from our Ancestors, we borrow it from our Children." Again, the words appear in white on a plain, black background. The message is presented for 7 seconds. The music in the videos is Barber's "Adagio for Strings," which research demonstrates is effective to induce negative emotions (Avramova & Stapel, 2008).

In the positive emotion appeal, negative emotion material is replaced with more positive material about the relationship between humans and the environment, along with images portraying the natural environment. The video opens with the first few lines of the folk song, “America the Beautiful” (by Katharine Lee Bates, 1895), reading, “O beautiful for spacious skies, for amber waves of grain! For purple mountain majesties above the fruited plain! America! America! God shed His grace on thee, and crown thy good with brotherhood, from sea to shining sea!” The words appear in white on a plain, black background. The message is presented for 10 seconds. The video then depicts a series of 25 images (played for 3 seconds each) that depict the beauty of the Earth and the natural environment. For example, participants viewed images of the ocean, waterfalls, flowers and other vegetation, such as forests and national parks, animals roaming on the plains, ducks on a peaceful lake, mountains and wildlife in their natural habitats, beautiful sandy beaches, and vast wilderness spaces. The video is intended to arouse positive emotions such as contentment, happiness, love, relaxation, calmness, and excitement. At the end of the video, a picture of the Earth from outer space is presented, followed by the same Ancient Indian Proverb as in the negative emotion video. The words appear in white on a plain, black background. The message is presented for 7 seconds. The music in the video is an allegro from Mozart's “Eine kleine Nachtmusik,” which research demonstrates is effective to induce positive emotions (Avramova & Stapel, 2008).

In the control condition, the neutral appeal, images of the environment are replaced with images of different buildings and architectural designs. The video opens with a quote from Chief Seattle in 1854, which references the interconnectedness of humans and the environment; “Humankind has not woven the web of life. We are but one

thread within it. Whatever we do to the web, we do to ourselves. All things are bound together. All things connect." The words appear in white on a plain, black background. The message is presented for 10 seconds. The video then depicts a series of 25 images of architectural buildings (played for 3 seconds each). The video is intended to arouse neither positive nor negative emotions; images of buildings are considered neutral, in that they are not likely to arouse a specific emotion. As in both the positive and negative appeals, a picture of the Earth from outer space is presented, followed by the same Ancient Indian Proverb in the other two videos; the words appear in white on a plain, black background. The message is presented for 7 seconds. The music in the neutral appeal video is from the 1982 film, Koyaanisqatsi: Life Out of Balance (Reggio, 1982). The specific piece used in this video is called "The Grid" and was written by composer, Phillip Glass; the original piece is nearly 20 minutes long, so only an excerpt of the piece was presented.

Participants were also randomly assigned to receive information on how to engage in more sustainable behaviors, presented as a series of tips at the end of the video, to reduce their impact on the environment. These tips included statements such as (but not limited to), "Buy fresh, locally grown, organic vegetables, instead of processed foods;" "Walk, bike, carpool, or take mass transit as much as you can;" "Bring your own canvas bags to the grocery store;" and, "Turn off computers, appliances, and lights when not in use." The statements reflect the seven aspects of personal lifestyles that most negatively impact the environment: agriculture, transportation, resource consumption, waste, home energy and water use, and toxic chemicals (Koger & Winter, 2010). A total of the 14 statements were presented individually for 3-seconds each, along with a

corresponding image. After the statements were presented, a quote from Edward Everett Hale was displayed, “I am only one. But still I am one. I cannot do everything, but still I can do something. And because I cannot do everything, I will not refuse to do the something that I can do.” This was shown as white text on a plain, black background for 7 seconds. There was no music played during this part of the video clip.

The videos were designed to represent typical characteristics of mass communications which attempt to arouse emotional reactions in order to motivate the audience to conform to a desired behavior. The videos were pretested to ensure that the manipulations functioned as intended (i.e., eliciting different emotional responses but containing the same amount of information). Participants in the pilot who viewed the negative video scored lower on the positive items of the PANAS ( $M = 26.10$ ,  $SD = 11.28$ ) than participants who viewed the positive video ( $M = 29.38$ ,  $SD = 6.80$ ) and the neutral video ( $M = 29.83$ ,  $SD = 8.86$ ), although these were not significantly different ( $F(2, 51) = 0.85$ ,  $p = 0.43$ ). Participants in the pilot who viewed the negative video scored significantly higher on the negative items of the PANAS ( $M = 22.70$ ,  $SD = 9.68$ ) than participants who viewed the positive video ( $M = 14.93$ ,  $SD = 4.38$ ) and the neutral video ( $M = 14.18$ ,  $SD = 5.77$ , ( $F(2, 49) = 7.84$ ,  $p = 0.001$ ). Due to the similar scores between the positive and neutral conditions on the PANAS scales, additional emotion-related words were added to the post-video emotion measure for both the negative PANAS subscale (e.g., fearful, scared) and positive PANAS subscale (e.g., content, happy) based on past research evaluating the role of emotion (e.g., Fredrickson, 1998, 2001; Janis & Feshbach, 1953). Both prior to the video and immediately after, participants were asked

to respond to a series of measures designed to assess an individual's current emotional state, and their environmental attitudes and behaviors.

**Emotion (Post-Video Manipulation Check).** Each participant then completed the Positive Affect and Negative Affect Scale (PANAS). This measure was used as a manipulation check for the impact of the video on participants' current emotional state (Watson, Clark, & Tellegen, 1988). When prompted with an emotion, the participants were asked to rate how much they were experiencing that emotion at the present time, using a scale where 1 = not at all or very slightly; 2 = a little; 3 = moderately; 4 = quite a bit; 5 = extremely. Participants who viewed the negative emotion videos scored significantly higher on the negative emotions on the PANAS ( $M = 31.25$ ,  $SD = 12.07$ ), compared to participants who viewed the positive emotion videos ( $M = 23.58$ ,  $SD = 13.31$ ) and the neutral video ( $M = 24.69$ ,  $SD = 11.73$ ;  $F(2, 239) = 9.88$ ,  $p < 0.001$ ). Participants who viewed the positive emotion videos scored significantly higher on the positive emotions on the PANAS ( $M = 50.54$ ,  $SD = 12.59$ ), compared to participants who viewed the negative emotion videos ( $M = 41.60$ ,  $SD = 13.22$ ) and the neutral video ( $M = 45.74$ ,  $SD = 13.18$ ;  $F(2, 242) = 9.19$ ,  $p < 0.001$ ). Participants in the neutral video condition scored higher on the positive emotions of the PANAS than participants in the negative emotion video condition, but lower than the participants in the positive emotion video condition. Conversely, neutral video condition participants scored about the same as positive video condition participants on the negative emotions of the PANAS, but much lower than participants in the negative video condition. These findings demonstrate that the videos were effective at manipulating the emotions they were designed to elicit (see Figure 1).

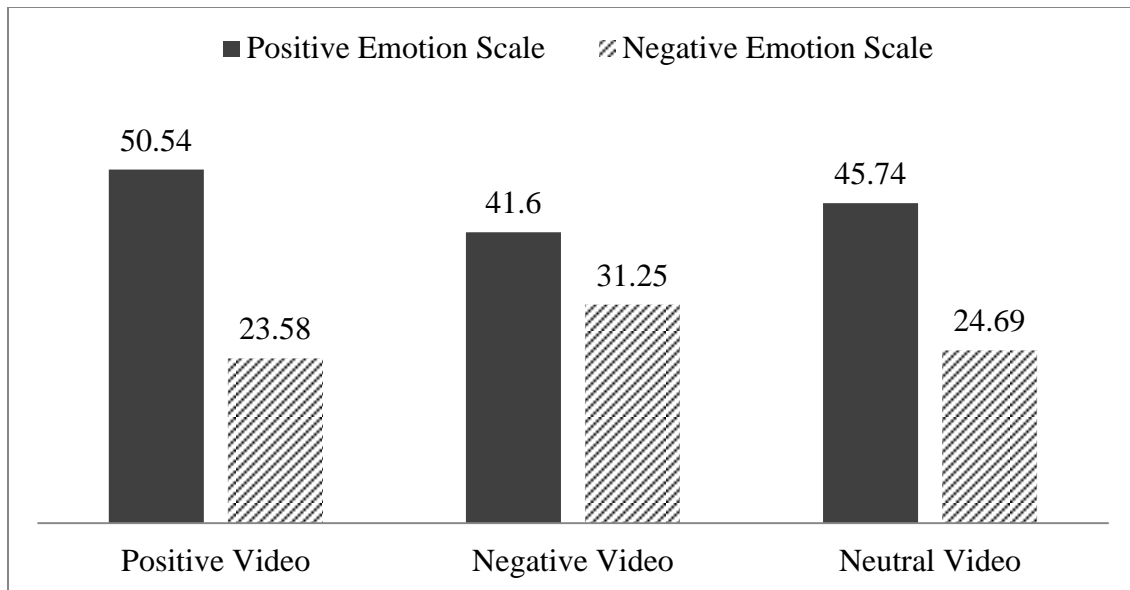


Figure 1. Emotion Elicited after Viewing a Positive, Negative or Neutral Video Appeal

**Filler Task.** A filler task, or delay, was presented immediately after the PANAS to remove the focus of the study out of conscious awareness (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). In this task, participants were asked to read an excerpt (“The Growing Stone”) from the novel, *Exile and the Kingdom* (Camus, 1957) and then answer questions about the reading.

**Environmental Concern.** Participants were asked to rank how important overall environmental issues (e.g., climate change, pollution, resource depletion, etc.) were to them, on a 7-point Likert scale, where 1 = not at all important, and 7 = extremely important. The majority of participants expressed that environmental issues were either “somewhat important” or “very important” ( $N = 67$  and  $99$ , respectively;  $M = 5.66$ ,  $SD = 1.09$ ). A one-way analysis of variance was run to determine if there were any differences between the community sample and student sample on their concern for the environment. Results indicate that community participants feel that overall environmental issues are more important to them ( $M = 5.87$ ,  $SD = 1.00$ ) than student participants ( $M = 5.05$ ,  $SD =$

1.09,  $F(1, 243) = 30.75, p < 0.001$ ; see Table 1). Similarly, an overwhelming majority ( $N = 233$ ) of participants indicated that they believed it was important to engage in pro-environmental behaviors, while only a small minority ( $N = 13$ ) indicated that they did not think it was important to engage in pro-environmental behaviors.

**Behavior Change Measures.** At the close of the study, the participant responded to questions about possible changes in their pro-environmental behaviors based on the video viewed. This is the primary dependent variable. Participants were asked to indicate whether they were willing to change any future behaviors to be more environmentally sustainable (e.g., eating less meat, buying more organic or fair trade products, choosing to walk or bike more frequently, etc.). Items were a sample of those available on the ecological footprint measure. Participants were asked to rate their likelihood to change each of the five behaviors on a 5-point scale, where 1 = very unlikely, and 5 = very likely). A total score on this measure was calculated by adding participants' responses on each of the five items, giving a range of total scores from 5 to 25. The scale demonstrated good internal reliability, with a Cronbach alpha coefficient of  $\alpha = 0.75$ . Participants scored fairly high on this measure ( $M = 18.97, SD = 4.00, \text{range} = 6.00\text{-}25.00$ ), although students' average score ( $M = 16.54, SD = 4.47$ ) was significantly lower ( $F(1, 240) = 37.82, p < 0.001$ ) than community participants' average score ( $M = 19.86, SD = 3.41$ ). Higher scores on this measure indicate greater willingness to change a variety of behaviors to be more sustainable. This served as a measure of the participant's behavioral intentions.

Once they had indicated their behavioral intentions, participants were presented with the opportunity to be involved in an environmentally-related public act. Student

participants received information about annual University-sponsored, campus-wide recycling events, and then were asked to provide their email address to be contacted for future participation in the events (e.g., Recyclemania and Go Green for Big Red). Community participants were given the opportunity to electronically sign a petition (e.g., “Tell the EPA to Stop the Pebble Mine and Save Bristol Bay”) supporting a pro-environmental cause. This served as a secondary outcome variable, looking at participants’ willingness to commit (yes or no) to be involved in a pro-environmental behavior.

**Phase 2.** One month following the completion of the initial phase of the study, participants were contacted for a short follow-up survey to determine whether they had changed any of their behaviors in a way that is more environmentally sustainable (via the ecological footprint measure). Scores on these items were compared with participants’ earlier scores on the ecological footprint to compare the difference in scores over time.

One hundred community sample members from phase one of the study participated in the follow-up survey (phase 2 of the study; response rate = 54.35%), and 48 students from phase one participated in phase 2 (response rate = 73.85%). Participants in the follow-up survey were asked to complete the same items on the EF measure a second time. The average score on the EF for phase 2 was 787.92 ( $SD = 304.96$ ;  $range = -70.00-1450.00$ ). As in Phase 1, community participants had significantly lower EF scores ( $M = 682.16$ ,  $SD = 280.62$ ) than student participants ( $M = 1006.17$ ,  $SD = 229.16$ ;  $F(1, 142) = 47.31$ ,  $p < 0.001$ ).



## CHAPTER III

### RESULTS

**Sample Differences on Current Pro-Environmental Behaviors.** Analyses indicated a significant difference between the community sample ( $M = 740.39$ ,  $SD = 288.59$ ) and the student sample ( $M = 1096.42$ ,  $SD = 267.21$ ) in this study, ( $F(1, 239) = 72.74$ ,  $p < 0.001$ ) on the Ecological Footprint measure. It was hypothesized that the difference in scores for these two populations may be due to the questions asked regarding sustainable behaviors. For example, seven of the questions asked on the measure relate to sustainable practices that one can do with a home to make it more sustainable(e.g., energy efficient appliances, extra insulation, solar panels, water saving fixtures, etc.); engaging in these behaviors can significantly reduce one's overall score on the measure. Individuals who engage in these sustainable behaviors, however, are likely to own their own homes, and thus are likely older (i.e., not undergraduate university students). Even without these factors added into the Ecological Footprint score, the two groups were still significantly different from each other in their overall scores on the measure ( $F(1, 239) = 66.56$ ,  $p < 0.001$ ). Community participants showed significantly lower EF scores ( $M = 690.83$ ,  $SD = 250.69$ ) than student participants ( $M = 985.13$ ,  $SD = 226.71$ ), demonstrating more sustainable lifestyles.

Additional analyses were run to determine if age was a determining factor in the difference in Ecological Footprint scores between the two samples. For the first analysis, age was manipulated to divide the samples into equal percentiles based on the total number of participants in the combined sample. This created two groups in the sample: participants of the age 25-years-old and younger, and participants 26 years of age and

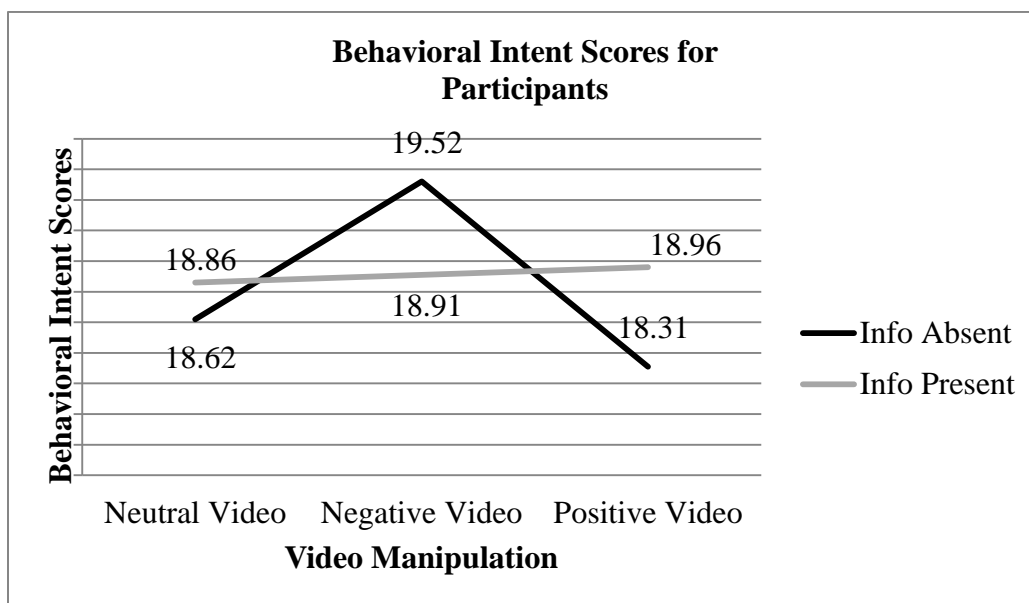
older. Results indicated a statistically significant difference between younger (25 and younger) participants ( $M = 901.48$ ,  $SD = 332.79$ ,  $N = 122$ ) and older (26 and over) participants ( $M = 758.41$ ,  $SD = 299.44$ ,  $N = 116$ ),  $F(1, 236) = 12.11$ ,  $p < 0.05$ ). In this study, ecological footprint therefore appears to be a proxy for sample, whereby all participants in the younger, student had less sustainable lifestyles than the older, community sample. As ecological footprint is hypothesized to be a more relevant factor than student status, per se, the principal analyses reported below use EF as a covariate rather than including sample as a factor.

**Behavior Change Intentions.** A 3 x 2 between-groups analysis of covariance (ANCOVA) was conducted to assess the effectiveness of emotion (negative, positive, or neutral) and information (present or not) on pro-environmental behavioral intentions (e.g., to reduce meat consumption, eat more local, organic and/or fair trade foods, walk and bicycle more, and recycle more), while controlling for participants' calculated ecological footprint score. There was not a statistically significant main effect for emotion ( $F(2, 228) = 0.01$ ,  $p = .99$ , *partial*  $r^2 = 0.00$ ), or information ( $F(1, 228) = 0.18$ ,  $p = .68$ , *partial*  $r^2 = 0.00$ ; see Table 3 for means). The interaction effect between these two variables failed to reach statistical significance ( $F(2, 228) = 0.19$ ,  $p = .83$ , *partial*  $r^2 = 0.00$ ). The covariate, however, was statistically significant ( $F(1, 228) = 77.62$ ,  $p < .001$ , *partial*  $r^2 = 0.25$ ). These findings indicate that those who were most willing to change their behaviors were those who already demonstrated more pro-environmental behaviors via low ecological footprint scores. Table 3 and Figure 2 show the means and standard deviations for participants in each video condition (emotion by information).

Table 3

*Means and Standard Deviations of Participants in Each Video Manipulation*

| Emotion  | Information | M     | SD   | N  |
|----------|-------------|-------|------|----|
| Neutral  | Absent      | 18.62 | 4.15 | 42 |
|          | Present     | 18.86 | 4.22 | 35 |
| Negative | Absent      | 19.52 | 3.85 | 69 |
|          | Present     | 18.91 | 3.77 | 32 |
| Positive | Absent      | 18.31 | 3.88 | 32 |
|          | Present     | 18.96 | 4.17 | 25 |



*Figure 2. Mean Score of Behavioral Intent Scores for Participants in the Six Video Conditions*

A hierarchical multiple regression analysis was performed to examine the unique contributions of current sustainable behaviors (via the ecological footprint), the primary independent variables (emotion and information), and environmental attitudes and empathy on participants' behavioral intention scores. In step 1 (Block 1), behavioral intention was the dependent variable, and EF scores, emotion, and information were the independent variables. In step 2 (Block 2), participants' scores on the EID, NEP, ECS, and IRI were added. In step 3 (Block 3), the interaction terms (standardized emotion x standardized EID/NEP/ECS/IRI scores, separately) were entered to test the hypotheses that participants with high scores on the environmental attitude measures (EID, NEP, and ECS; H3) and empathy measure (IRI; H4) would be more likely to show higher behavioral change intentions after viewing the negative emotion video. Conversely, participants with low scores on the environmental attitude and empathy measures were hypothesized to show greater behavioral change intentions after viewing the positive video.

The results of step 1 indicated that the variance accounted for ( $R^2$ ) with the first three variables (EF, emotion, information) equaled 0.26 (adjusted  $R^2 = 0.25$ ), which was significantly different from zero ( $F(3, 216) = 25.49, p < 0.001$ ). Ecological footprint score was the only statistically significant independent variable,  $\beta = -0.51, p < 0.001$ . In step 2, the environmental attitude and empathy score variables were entered into the regression equation. The change in variance accounted for ( $\Delta R^2$ ) was equal to 0.25, which was significantly different from zero ( $F(7, 212) = 31.77, p < 0.001$ ). In step 3, the interaction terms were entered to test for moderator effects of the individual difference measures. The change in variance accounted for ( $\Delta R^2$ ) was equal to 0.02, which was

significantly different from zero ( $F(11, 208) = 20.20, p < 0.001$ ), but did not contribute significantly to the overall model ( $F \text{ change } (4, 208) = 0.48, p = 0.75$ ). All of the environmental attitude scales, ecological footprint scores and empathy contributed significantly to the explanation of behavioral intentions; however, the primary independent variables (emotion and information) and interaction terms did not. The regression results are reported in Table 4.

Table 4

*Unstandardized Regression Coefficients (B), and Intercept, the Standardized Regression Coefficients ( $\beta$ ), t-values, and significance values (p) for Variables as Predictors of Pro-Environmental Behavior Intentions.*

| Variables     | <i>B</i> ( <i>SE</i> ) | $\beta$ | <i>t</i> -value | <i>p</i> -value |
|---------------|------------------------|---------|-----------------|-----------------|
| Intercept     | 3.546(2.084)           |         | 1.702           | 0.090           |
| EF            | -0.003(0.001)          | 0.001   | -4.877          | <0.001          |
| Emotion       | 0.066(0.262)           | 0.012   | 0.253           | 0.801           |
| Information   | 0.216(0.400)           | 0.026   | 0.540           | 0.590           |
| EID           | 0.074(0.016)           | 0.294   | 4.551           | <0.001          |
| NEP           | 0.057(0.023)           | 0.128   | 2.465           | 0.014           |
| ECS           | 0.265(0.089)           | 0.182   | 2.986           | 0.003           |
| IRI           | 0.064(0.018)           | 0.186   | 3.554           | <0.001          |
| Emotion x EID | 0.27(0.23)             | 0.07    | 1.15            | 0.25            |
| Emotion x NEP | 0.09(0.22)             | 0.02    | 0.42            | 0.68            |
| Emotion x ECS | -0.17(0.24)            | -0.05   | -0.72           | 0.47            |

|               |             |        |       |      |
|---------------|-------------|--------|-------|------|
| Emotion x IRI | -0.01(0.22) | -0.002 | -0.04 | 0.97 |
|---------------|-------------|--------|-------|------|

---

**Willingness to Commit.** A little more than half of participants ( $N = 140$ ; 56.20%) indicated that they would be willing to engage in the pro-environmental behavior. Because the pro-environmental behavior was different for the two samples, data were analyzed separately. A majority of the community participants demonstrated a willingness to engage in a public pro-environmental behavior ( $N = 134$ ; 74.90%). Students, however, demonstrated the opposite; only a small minority of students expressed a willingness to engage in a public pro-environmental behavior ( $N = 6$ , 9.20%).

Separate logistic regression analyses were conducted to predict participants' willingness to commit to a public pro-environmental behavior. The regressions used respondents' scores on the ecological footprint (EF), Environmental Identity scale (EID), the New Ecological Paradigm (NEP), the Environmental Connectivity Scale, empathy (as measured by the Interpersonal Reactivity Index; IRI), as well as the emotional appeal they viewed in the video (positive, negative, or neutral) and the presence or absence of information, as predictor variables.

*Community sample.* A test of the full model against a constant only model was significant, indicating that the predictors as a set reliably distinguished between community participants who did or did not demonstrate a willingness to participate in a public pro-environmental behavior ( $\chi^2 = 42.79$ ,  $p = 0.00$ ,  $df = 8$ ). The Wald criterion demonstrated that empathy ( $Wald = 7.78$ ,  $B = -0.07$ ,  $SE = 0.02$ ,  $df = 1$ ,  $p = 0.01$ ), scores on the EID ( $Wald = 4.82$ ,  $B = -0.04$ ,  $SE = 0.02$ ,  $df = 1$ ,  $p = 0.03$ ), and scores on the NEP ( $Wald = 8.52$ ,  $B = -0.09$ ,  $SE = 0.03$ ,  $df = 1$ ,  $p = 0.00$ ) made significant contributions to the

model. The EF scores, ECS scores, emotion appeal, and information presence or absence were not significant predictors.

*Student sample.* A test of the full model against a constant only model was not statistically significant, indicating that the predictors as a set did not reliably distinguish between student participants who did or did not demonstrate a willingness to participate in a public pro-environmental behavior ( $\chi^2 = 9.74, p = 0.28, df = 8$ ). The Wald criterion demonstrated that no predictors made significant contributions to the prediction.

**Behavior Change.** Behavior change from phase one of the study to the follow up survey (phase two) was measured from two primary measures: scores on the EF (post-measure), and a series of yes/no questions on six (6) specific behaviors, mirroring the items on the behavior change intention scale. Overall, mean scores on the EF declined from Phase 1 ( $M = 831.98, SD = 322.86, range = 40.00-1630.00$ ) to Phase 2 ( $M = 787.92, SD = 304.96, range = -70.00-1450.00$ ). A paired samples t-test was conducted to evaluate whether participants demonstrated a change in ecological footprint scores from the first phase to the second phase of the study; only participants who completed both surveys were included in the analysis. There was a statistically significant decrease in EF scores from Phase 1 ( $M = 831.64, SD = 346.69$ ) to Phase 2 ( $M = 788.91, SD = 309.72, t(137) = 2.70, p = 0.008, r^2 = 0.05$ ). As with Phase 1, community sample participants had significantly lower Phase 2 (post-measure) EF scores ( $M = 682.17, SD = 280.62$ ) than students ( $M = 1006.17, SD = 229.16, F(1, 142) = 47.31, p < 0.001$ ). There was no statistically significant difference between community sample participants ( $M = 24.28, SD = 191.07$ ) and student sample participants ( $M = 82.14, SD = 170.89, t(136) = -1.71, p = 0.09$ ).

A 3 x 2 between-groups analysis of covariance (ANCOVA) was conducted to assess the effectiveness of emotion (negative, positive, or neutral) and information (present or not) on pro-environmental behavior change (measured by change in EF scores from Phase 1 to Phase 2), while controlling for participants' calculated ecological footprint score at Phase 1. There was not a statistically significant main effect for emotion ( $F(2, 131) = 0.29, p = .74, \text{partial } r^2 = 0.004$ ), or information ( $F(1, 131) = 0.01, p = .91, \text{partial } r^2 < 0.001$ ). The interaction effect between these two variables failed to reach statistical significance ( $F(2, 131) = 0.26, p = .77, \text{partial } r^2 = 0.004$ ). The covariate, however, was statistically significant ( $F(1, 131) = 31.06, p < 0.001, \text{partial } r^2 = 0.19$ ). These findings again indicate that those who demonstrated behavioral change were those who previously displayed low ecological footprint scores. Table 5 shows the means and standard deviations for participants in each video condition (emotion x information) on the behavior change measure.

Table 5

*Means and Standard Deviations of Participants' Change in Ecological Footprint Scores by Video and Information Manipulation*

| Emotion  | Information | M     | SD     | N  |
|----------|-------------|-------|--------|----|
| Neutral  | Absent      | 44.26 | 201.98 | 31 |
|          | Present     | 87.36 | 173.44 | 22 |
| Negative | Absent      | 14.49 | 193.19 | 37 |
|          | Present     | 15.69 | 138.34 | 13 |
| Positive | Absent      | 85.05 | 153.50 | 20 |



|         |       |        |    |
|---------|-------|--------|----|
| Present | 10.73 | 230.03 | 15 |
|---------|-------|--------|----|

Participants in the second phase of the study were also asked whether they had changed specific behaviors to be more pro-environmental since their participation in Phase one. The six items are the same as the items on the behavior intention scale from the first phase, and include: decreased consumption of meat, increased consumption/purchase of local foods, increased consumption of organic and/or fair trade foods, increased bicycling or walking for transportation, increased recycling efforts, and changed their thermometer setting to save energy. Participants were asked to respond “yes” or “no” to each of the items. About half of the participants reported a reduction in their meat consumption (N = 72, 48.60%), having eaten or purchased more local foods (N = 70, 47.30%), recycled more (N = 82, 55.40%), and changed their thermometer setting to save energy (N = 79, 53.4%) in the last month (see Table 6). Fewer than half of participants reported that they had increased their consumption or purchase of organic or fair trade foods (N = 63, 42.6%), but a majority of respondents (N = 98, 66.2%) indicated they had increased their bicycling and walking for transportation in the past month. Table 6 gives an overview of these behavior changes.

Table 6

*Participants' Responses to Specific Behavior Changes since Phase One of the Study*

|  | Yes          | No           |
|--|--------------|--------------|
|  | <i>N</i> (%) | <i>N</i> (%) |
| Reduced meat consumption                         | 72 (51.4%)   | 76 (48.6%)   |
| Eaten/purchased more local foods                 | 78 (52.7%)   | 70 (47.3%)   |
| Eaten/purchased more organic or fair trade foods | 63 (42.6%)   | 85 (57.4%)   |
| Rode your bike or walked more                    | 98 (66.7%)   | 49 (33.3%)   |
| Recycled more                                    | 82 (55.4%)   | 66 (44.6%)   |
| Changed your thermometer setting to save energy  | 79 (53.4%)   | 69 (46.6%)   |

Chi-square tests were conducted to explore whether there was a difference between samples on actual pro-environmental behaviors. These tests indicated that community participants were significantly more likely than students to have reduced their meat consumption (*Pearson chi-square* = 13.23,  $p < 0.001$ ) and increased their recycling (*Pearson chi-square* = 3.91,  $p = 0.048$ ), from Phase one to Phase two of the study. Community participants and student participants were equally likely to have eaten or purchased more local foods (*Pearson chi-square* = 0.90,  $p = 0.34$ ), eaten or purchased more organic or fair trade foods (*Pearson chi-square* = 3.72,  $p = 0.05$ ), ridden a bike or walked more (*Pearson chi-square* = 0.14,  $p = 0.71$ ), and changed their thermometer setting to save energy (*Pearson chi-square* = 0.05,  $p = 0.83$ ), from Phase one to Phase two of the study. Table 7 displays the crosstabs of the six behavior change items by sample.

Table 7

*Percentage of Community and Student Sample Participants Who Indicated Pro-Environmental Behavior Change from Phase One to Phase Two of the Study*

|   | Community Sample |       | Student Sample |       |
|---|------------------|-------|----------------|-------|
|   | No               | Yes   | No             | Yes   |
| Reduced your meat consumption                       | 41.0%            | 59.0% | 72.9%          | 27.1% |
| Eaten or purchased more local foods                 | 50.0%            | 50.0% | 58.3%          | 41.7% |
| Eaten or purchased more organic or fair trade foods | 52.0%            | 48.0% | 68.8%          | 31.3% |
| Rode your bike or walked more                       | 32.3%            | 67.7% | 35.4%          | 64.6% |
| Recycled more                                       | 39.0%            | 61.0% | 56.3%          | 43.8% |
| Changed your thermometer setting to save energy     | 46.0%            | 54.0% | 47.9%          | 52.1% |

A series of six logistic regression analyses was run to determine which variables (if any) predicted behavior change outcomes (decreased consumption of meat, increased consumption/purchase of local foods, increased consumption of organic and/or fair trade foods, increased bicycling or walking for transportation, increased recycling efforts, and changed their thermometer setting to save energy). The predictor variables for each analysis were the same: emotion (neutral, negative, and positive), information (present, absent), post-measure EF scores, environmental attitudes (EID, NEP, ECS), and empathy (IRI). For the “reduced meat consumption” behavior change, the Wald criterion demonstrated that EF ( $Wald = 5.08$ ,  $B = -0.002$ ,  $SE = 0.001$ ,  $df = 1$ ,  $p = 0.02$ ), and scores

on the EID ( $Wald = 9.53$ ,  $B = 0.07$ ,  $SE = 0.02$ ,  $df = 1$ ,  $p = 0.002$ ), and scores on the IRI ( $Wald = 5.57$ ,  $B = 0.05$ ,  $SE = 0.02$ ,  $df = 1$ ,  $p = 0.02$ ) made significant contributions to the model. The emotion appeal, information presence or absence, and scores on the ECS and NEP were not significant predictors.

The Wald criterion demonstrated that the positive emotion video appeal ( $Wald = 5.01$ ,  $B = -1.14$ ,  $SE = 0.51$ ,  $df = 1$ ,  $p = 0.03$ ) made a significant contribution to the model for the “eaten or purchased more local foods” behavior change. The negative and neutral video appeals, presence or absence of information, and scores on the EID, NEP, ECS, IRI, and EF were not significant predictors. With regards to the “eaten or purchased more organic or fair trade foods” behavior change, the Wald criterion demonstrated that scores on the EF ( $Wald = 3.82$ ,  $B = -0.002$ ,  $SE = 0.001$ ,  $df = 1$ ,  $p = 0.05$ ) made a significant contributions to the model. The emotion appeal, presence or absence of information, and scores on the EID, NEP, ECS, and IRI were not significant predictors.

The Wald criterion demonstrated that only scores on the EID ( $Wald = 3.92$ ,  $B = -0.04$ ,  $SE = 0.02$ ,  $df = 1$ ,  $p = 0.05$ ), made a significant contribution to the model for the “rode your bike or walked more” behavior change. The emotion appeal, presence or absence of information, and scores on the EF, NEP, ECS and IRI were not significant predictors. By contrast, the Wald criterion demonstrated that scores on the EF ( $Wald = 7.16$ ,  $B = -0.002$ ,  $SE = 0.001$ ,  $df = 1$ ,  $p = 0.01$ ), and information present ( $Wald = 7.56$ ,  $B = 1.18$ ,  $SE = 0.47$ ,  $df = 1$ ,  $p = 0.01$ ) made a significant contribution to the model for the “recycled more” behavior change. The emotional appeals, and scores on the EID, NEP, ECS, and IRI were not significant predictors. For the “changed your thermometer setting to save energy” behavior change, none of the variables entered into the model were

significant predictors. Table 8 shows the contribution of each predictor variables for each of the six analyses.

Table 8

*Contribution of Variables in Predicting Actual Behavior Change*

| Predictor Variable    | Wald  | Eaten or<br>purchased         |                            |   |   |      |
|-----------------------|-------|-------------------------------|----------------------------|---|---|------|
|                       |       | Eaten or<br>purchased<br>more | more<br>organic<br>or fair | Rode<br>your<br>bike or<br>walked<br>more | Changed<br>your<br>thermometer<br>setting to<br>save energy |      |
| Emotion (neutral)     | 4.79  | 5.55                          | 3.09                       | 0.75                                      | 0.49  | 2.45 |
| Emotion (negative)    | 1.78  | 2.57                          | 2.55                       | 0.69                                      | 0.06  | 2.39 |
| Emotion (positive)    | 1.08  | 5.01*                         | 1.74                       | 0.01                                      | 0.49  | 0.74 |
| Information (present) | 0.44  | 0.20                          | 0.90                       | 1.33                                      | 7.56*   | 1.11 |
| EF (post measure)     | 5.08* | 0.001                         | 3.82*                      | 0.27                                      | 7.16*   | 1.07 |
| EID                   | 9.53* | 1.86                          | 1.83                       | 3.92*                                     | 0.57  | 0.52 |
| NEP                   | 2.29  | 0.002                         | 0.96                       | 0.97                                      | 1.05  | 0.03 |
| ECS                   | 1.84  | 0.41                          | 3.33                       | 0.81                                      | 0.05  | 0.17 |
| IRI                   | 5.57* | 3.31                          | 2.15                       | 0.60                                      | 2.19  | 0.95 |

Note. \*Predictor is significant at  $p < 0.05$ .

A hierarchical multiple regression analysis was performed to examine the unique contributions of participants' EF scores (as measured in Phase 1) and the primary independent variables (emotion and information), and environmental attitudes and empathy on participants' change in EF scores (Phase 2 EF scores minus Phase 1 EF scores). In step 1 (Block 1), behavioral change was the dependent variable, and EF scores (from phase one) emotion, and information were the independent variables. In step 2 (Block 2), participants' scores on the EID, NEP, ECS, and IRI were entered into the step 1 equation. In step 3 (Block 3), the interaction terms (standardized emotion x standardized EID/NEP/ECS/IRI scores, separately) were entered to test the hypotheses that participants with high scores on the environmental attitude measures (EID, NEP, and ECS; H3) and empathy measure (IRI; H4) would be more likely to show greater behavior change differences after viewing the negative emotion video. Conversely, participants with low scores on the environmental attitude and empathy measures were hypothesized to show lower behavior change differences after viewing the positive video.

The results of step 1 indicated that the variance accounted for ( $R^2$ ) with the first three variables (EF, emotion, information) equaled 0.18 (adjusted  $R^2 = 0.16$ ), which was significantly different from zero ( $F(3, 113) = 8.16, p < 0.001$ ). Ecological footprint score was the only statistically significant independent variable,  $\beta = 0.42, p < 0.001$ . In step 2, the environmental attitude and empathy score variables were entered into the regression equation. The change in variance accounted for ( $\Delta R^2$ ) was equal to 0.20, which was significantly different from zero ( $F(7, 109) = 3.94, p < 0.001$ ), but only represented a marginally significant increase to the overall model ( $F \text{ change } (4, 109) = 0.82, p = 0.51$ ). Again, EF scores were the only statistically significant independent variable,  $\beta = 0.48, p$

$< 0.001$ . In step 3, the interaction terms were entered to test for moderator effects of the individual difference measures on behavior change. The change in variance accounted for ( $\Delta R^2$ ) was equal to 0.009, which was significantly different from zero ( $F(11, 105) = 2.56$ ,  $p = 0.007$ ), but did not contribute significantly to the overall model ( $F \text{ change } (4, 105) = 0.31$ ,  $p = 0.87$ ). Only ecological footprint scores contributed significantly to the explanation of actual behavior change,  $\beta = 0.48$ ,  $p < 0.001$ ; neither of the primary independent variables (emotion and information), nor environmental attitudes, empathy, and interaction terms, contributed significantly to the model. The unstandardized regression coefficients (B) and intercept, and the standardized regression coefficients ( $\beta$ ), for the full model are reported in Table 9. Only ecological footprint scores contributed significantly to the explanation of pro-environmental behavior change; neither the primary independent variables (emotion and information), nor the environmental attitudes and empathy scores, did.

Table 9

*Unstandardized Regression Coefficients (B), and Intercept, the Standardized Regression Coefficients ( $\beta$ ), t-values, and significance values (p) for Variables as Predictors of Pro-Environmental Behavior Intentions.*

| Variables     | <i>B</i> ( <i>SE</i> ) | $\beta$ | <i>t</i> -value | <i>p</i> -value |
|---------------|------------------------|---------|-----------------|-----------------|
| Constant      | -349.16(175.19)        |         | -1.99           | 0.05            |
| EF            | 0.27(0.06)             | 0.48    | 4.55            | >0.001*         |
| Emotion       | 57.30(137.00)          | .24     | 0.42            | 0.68            |
| Information   | -5.03(35.07)           | -0.01   | -0.14           | 0.89            |
| EID           | 2.75(1.53)             | 0.23    | 1.80            | 0.08            |
| NEP           | -0.07(1.94)            | -0.003  | -0.03           | 0.97            |
| ECS           | -2.41(12.10)           | -0.40   | -1.00           | 0.84            |
| IRI           | 0.20(1.60)             | 0.01    | 0.13            | 0.90            |
| Emotion x EID | 15.22(22.46)           | 0.09    | 0.68            | 0.50            |
| Emotion x NEP | -1.92(18.38)           | -0.01   | -0.11           | 0.92            |
| Emotion x ECS | -4.32(9.42)            | -0.27   | -0.46           | 0.65            |
| Emotion x IRI | 13.51(17.61)           | 0.08    | 0.77            | 0.45            |

Note. \*Predictor is significant at  $p < 0.05$ .

***Income and Individual Responsibility.*** Participants in Phase 2 of the study were also asked to indicate their income and the extent to which they believed individuals could have on solving environmental problems as these variables are believed to be related to pro-environmental behavior. Contrary to other research (e.g., Csutora, 2012),



income was not significantly correlated with participants' scores on the Ecological Footprint (post) measure ( $r = -0.001$ ,  $N = 144$ ,  $p = 0.99$ ) in this study.

Participants were then asked two questions regarding responsibility for addressing environmental problems. First, participants were asked to indicate whether they believed “the government, business, and industry” or “individual citizens and citizen’s groups” should have the primary responsibility for protecting the environment. More than half of the respondents ( $N = 89$ ) reported that they believed this responsibility fell to the government, business, and industry, while fewer than one-third ( $N = 53$ ) reported that they believed individual citizens and citizen’s groups were responsible for protecting the environment. It was hypothesized that respondents who felt that individual citizens and citizens groups were primarily responsible for protecting the environment would show higher Ecological Footprint scores. This hypothesis was not confirmed; there were no significant differences between scores on the EF (post measure) for individuals who believe the government and businesses are responsible for protecting the environment ( $M = 795.95$ ,  $SD = 317.78$ ), compared to individuals who believe it's the responsibility of individuals ( $M = 768.30$ ,  $SD = 285.74$ ;  $F(1, 140) = 0.271$ ,  $p = 0.604$ ).

Participants were then asked to identify how much of an effect they believed individual citizens and citizens’ groups can have on solving environmental problems. Over half ( $N = 76$ , 52.4%) of the participants felt that individual citizens and citizens’ groups can have “a fair amount” of an effect on environmental problems, while 51 participants (35.2%) felt that that individual citizens and citizens’ groups can have “a great deal” of an effect on environmental problems. Only a small minority of participants ( $N = 18$ , 12.4%) felt that individual citizens and citizens’ groups can have “not very

much” of an effect on environmental problems, and no participants selected “not at all” in response to the question. There was a statistically significant difference on EF scores (post measure) between participants who believe that individuals can have "a great deal" of impact on addressing environmental problems ( $M = 712.40$ ,  $SD = 290.92$ ) compared to those who believe that individuals can have "not very much" impact on addressing environmental problems ( $M = 915.88$ ,  $SD = 256.10$ ,  $F(2, 138) = 3.142$ ,  $p = 0.046$ ). Participants who believe that individuals can have “a fair amount” ( $M = 792.03$ ,  $SD = 308.39$ ) of impact on addressing environmental problems were not statistically different from participants in the “a great deal” or “not very much” groups on the EF post measure.

## **CHAPTER IV**

### **DISCUSSION**

This research failed to demonstrate support for the four hypothesized relationships between emotion, information, and sustainable behavior. It was hypothesized that, consistent with research on the impact of emotions for behavior change (e.g., Dabbs & Janis, 1965; Janis & Feshbach, 1953), a negatively-framed appeal would have less of an impact on participants' pro-environmental attitudes and behaviors than a positively-framed appeal. The current research study did not find that, compared to a control condition, a negatively-framed video clip nor did a positively-framed video clip have an impact on whether individuals would change their behavior to be more environmentally sustainable.

It was also hypothesized that the presence of information on how to be more sustainable and reduce one's impact on the environment would lead to greater behavior changes over time. The findings from this research failed to confirm this hypothesis. The presence or absence of this type of information did not influence participants' likelihood to engage in pro-environmental behavior change. It is possible that this information was not novel for participants, thus inhibiting its effectiveness. Pro-environmental information is widely available in media coverage, and the information presented was consistent with what one may see on a billboard advertisement, hear on the radio, or see on TV. It is possible that people have simply learned the language of environmentalism (e.g., recycling, water and resource conservation, etc.) without adopting the consequent behaviors (Scott & Willits, 1994).

This research also investigated the relationship between one's current pro-environmental attitudes and pro-environmental behaviors. Results indicated partial support for the role of pro-environmental attitudes on behavioral intentions (e.g., "How likely are you to recycle more?") in a regression model. The predictive role of pro-environmental attitudes on pro-environmental behavioral intentions is consistent with research on the theory of reasoned action and an individual's readiness to perform a given behavior (Ajzen & Fishbein, 1980; Ajzen & Madden, 1986).

There was scant empirical support for the relationship between pro-environmental attitudes and actual pro-environmental behavior change, when evaluated via post-measure EF scores. While the EID significantly predicted specific behavior change (i.e., reduced meat consumption and increased bicycling or walking) in a logistic regression model, the other pro-environmental attitudes (the NEP and ECS) did not significantly contribute to the model. Furthermore, there was not a significant main effect for pro-environmental attitudes on overall pro-environmental behavior change, as measured by the change in EF scores from Phase 1 to Phase 2. This finding may be explained by the distinction between general attitudes and specific behaviors. Fishbein and Ajzen (1975) argue that attitude and behavior measures should be at similar levels of specificity, and that one cannot expect that general attitudes (e.g., about the environment) would be strongly related to specific individual behaviors (e.g., recycling). This is especially true when considering pro-environmental behaviors, as research has found that there is no common set of variables to predict a wide range of pro-environmental behaviors (McKenzie-Mohr, Nemiroff, Beers, & Desmarais, 1995). Research demonstrates that attitudes are predictive of actual pro-environmental behaviors when they are consistent.

For example, Schultz, Oskamp, and Mainieri (1995) found that recycling-specific attitudes consistently predict actual recycling behavior, but general pro-environmental attitudes do not. Another possible consideration is that respondents may not have indicated behavior change, weakening the behavioral indices, if none or only a few of the environmental activities were accessible to them. Research has shown that individuals who engage in one form of pro-environmental behavior often do not engage in others (Thøgersen, 1999; Tracy & Oskamp, 1984), demonstrating a diminished perception of personal responsibility, or will only adopt new behaviors that are similar or closely related to already established pro-environmental behaviors (Reams, Geaghan, and Gendron, 1996). Both of these factors may have played a role in the current study.

It was hypothesized that individuals who scored high on the pro-environmental attitude measures would be more influenced by the negative emotion appeal, such that they would show a greater difference in their behavioral intentions and follow up pro-environmental behaviors. Conversely, those with low scores on the pro-environmental attitude measures would be more influenced by the positive emotion appeal, and would show greater changes in both predicted and long-term pro-environmental behaviors when exposed to the positive emotion condition, compared to the negative emotion condition. Results failed to support this hypothesis; pro-environmental attitudes did not moderate the influence of emotion-inducing video appeals.

Lastly, it was hypothesized that empathy would moderate the impact of emotionally-arousing videos on pro-environmental behaviors, such that participants who scored high on the IRI would be more influenced by the negative emotion appeal than the positive emotion appeal, and display more changes in pro-environmental behaviors from

the initial assessment to the follow up study. Conversely, it was predicted that participants who scored low on the empathy measure would be more influenced by the positive emotion appeal, and show changes in pro-environmental behavior only after viewing the negative emotion appeal. Results showed that empathy was a significant predictor of pro-environmental behavior intentions in a regression model, but failed to demonstrate the hypothesized moderating effect. Furthermore, empathy was not a significant predictor of pro-environmental behavior change, as measured by a change in EF scores, in a regression model.

Throughout the various analyses conducted in this research study, the only consistent predictor of pro-environmental behavior intentions and actual pro-environmental behavior change was an individual's current pro-environmental behaviors (as measured via an Ecological Footprint measure). Individuals who showed behavior change intentions were those who already engage in a number of pro-environmental behaviors, regardless of environmental concern and empathy. This is consistent with other research on the relationship between environmental attitudes and behavior (Scott & Willits, 1994). Research suggests, and the current study confirms, that past pro-environmental behavior (e.g., recycling) has a greater influence than pro-environmental attitudes (Bagozzi & Dabholkar, 1994) on pro-environmental behavior change.

As discussed in the introduction, a major problem with studying environmental problems is that people have a difficult time understanding the adverse outcomes of their unsustainable behaviors, often because the negative consequences are not immediately seen (Vining & Ebero, 2002). Even for those who do engage in pro-environmental behaviors, it is not often that these individuals will see concrete evidence of these

behaviors on an individual basis (e.g., a smaller hole in the ozone layer, or cooling of the Earth's core temperature). While some pro-environmental behaviors are positively reinforcing for individuals, these incentives are not usually directly tied to the environment, but to some other tangible outcome (e.g., reduced energy costs from changing a thermostat). While this may be enough for those who are already engaging in pro-environmental behaviors or exhibit strong concern for the environment, it may not be enough motivation for those who are not already engaged in pro-environmental behaviors, or those who are skeptical about environmental problems and ecological "crises."

### **Limitations and Directions for Future Research**

There are a number of limitations present in the current study that could be addressed in future research. The current study used a mix of two samples: a student sample from a large Midwestern university, and a nation-wide community sample. Although the student sample demonstrated lower pro-environmental attitudes and behaviors than the community sample, it is impossible to know if this is simply an artifact of the differences in the samples (e.g., undergraduate students are less environmentally conscious compared to community dwellers), geographic location, or, as some of the analyses suggest, variables confounded with student status such as age. According to different rankings, coastal states are usually ranked as more sustainable than Midwest and land-locked states<sup>3</sup>, so the differences in environmental attitudes and behaviors may be due to geographic location (unfortunately the survey did not ask community participants

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<sup>3</sup> Greenopia.com, 2011 Comprehensive Environmental Ranking of US States. Available online at: [http://www.greenopia.com/SB/state\\_search.aspx?category=State&Listpage=0&input=Name-or-product&subcategory=None](http://www.greenopia.com/SB/state_search.aspx?category=State&Listpage=0&input=Name-or-product&subcategory=None). Accessed April 23, 2013.

their state of residence). A comparative study might include a non-student sample within the same geographic community as the university to draw more conclusive results.

The current study also used different behaviors to measure participants' willingness to commit to a public pro-environmental behavior. Students were given the opportunity to indicate their willingness to participate in University-sponsored recycling events, and community participants were given the opportunity to sign an online petition. Arguably, signing an online petition is a different type of commitment compared to providing one's email address to a list-serve to be contacted for participation in a future recycling event; therefore we cannot draw meaningful conclusions across the two samples. Further, it is not necessarily the case that students are not willing to participate in campus-wide recycling events, but rather, the behavior commitment offered did not provide explicit information on how the student would be involved. For community participants, the willingness to commit was much clearer; they simply followed a link and could choose to click a button to demonstrate their support for the petition.

Another limitation of the present study is the reliance on self-reported behavior as the primary dependent variables of interest. A number of research studies suggest that self-reported pro-environmental behavior is not a valid indicator of actual pro-environmental behavior (e.g., water conservation and recycling; DeOliver, 1999; McGuire, 1984), and furthermore, research (e.g., Obregon-Salido & Corral-Verdugo, 1997) has found that the predictors of self-reported behavior may be different than the predictors of actual, observed environmental conservation behaviors. Future research should implement observable behavior measures to identify whether the current findings are limited by the self-reported behavioral data.



It is also possible that the variable manipulations in the present study were not strong enough to affect the desired pro-environmental behaviors. While pilot testing and analysis of the present manipulations showed that the positive video elicited higher ratings on the positive emotions scale (and lower ratings on the negative emotions scale), and the negative video elicited higher rating on the negative emotions scale (and lower ratings on the positive emotions scale), the differences, although statistically significant, were not large. Further, the neutral video appeal tended to elicit similar emotional reactions as the positive emotion appeal. Future iterations of this study should try to manipulate stronger emotional reactions, and particularly, tease apart quantitative differences between emotions that may be considered “positive” (e.g., happy, euphoric, etc.) and emotions that are maybe more “neutral” (e.g., content, calm, etc.). Future research could also focus on looking at the impact of priming specific negative (e.g., fear versus anger versus disgust) or positive (e.g., elated versus interested versus inspired) emotions on motivating pro-environmental behavior change.

The present study used a variation of the Ecological Footprint tool as a measure of current pro-environmental behaviors and to assess change in pro-environmental behaviors. The tool does ask about one’s current pro-environmental behaviors, but critics argue that the tool is not a valid measure of sustainability based on economic principles and environmental science (Fiala, 2008), and some research has identified a gap between environmental awareness and behavior, and actual environmental impact, as measured by the EF tool (Csutora, 2012). One of the primary weaknesses of the tool used in the present study was the failure to include some variables that are known to predict EF scores, namely income and external factors, such as social and cultural factors. The

present study only asked respondents in Phase 2 of the research to indicate their income, and while income was not significantly correlated with EF scores, it is possible that this finding was limited by the sample (e.g., student participants have a lower income than community participants). Future research would benefit from including this type of information in the study measures, as these are often cited as important determinants of not only current pro-environmental behaviors, but also willingness to engage in pro-environmental behavior change (Kollmuss & Aygeman, 2002).

Along these same lines, the present study did not address participants' barriers to behavioral change. Kollmuss and Aygeman (2002) developed a model of pro-environmental behavior which includes both internal and external factors that may influence an individual's willingness to engage in pro-environmental behaviors. Emotion is just one of many internal factors that may influence pro-environmental behaviors, but even if emotion were to influence pro-environmental behaviors, there are a number of barriers that can inhibit actual behavior. For example, research has identified a number of social and individual barriers to pro-environmental behavior, including lack of information, facilities, and interest (Blake, 1999), or even more paralyzing, old behavior patterns and habits (Kollmuss & Aygeman, 2002). Furthermore, people may not engage in pro-environmental behavior because they do not believe that it will make a difference, or that there is no "environmental crisis" that warrants behavior change (Blake, 1999). This was seen in some of the qualitative data collected in the present study; some participants indicated a lack of motive to engage in pro-environmental behaviors simply because it was not important to them, or they believed that there were more pressing issues warranting their concern. Future research should focus on identifying individuals

who do not believe it is important to engage in pro-environmental behaviors to further understand the barriers to behavior change. Only then will research be able to address ways to overcome these barriers and engage a greater number of individuals into adopting more sustainable behaviors.

### **Conclusion**

The present study was designed to investigate the impact of emotion and information on pro-environmental behavior. Results indicated that neither of these factors was found to influence pro-environmental behavior change. Notably, however, the present study confirms the importance of pro-environmental attitudes on predicting behavioral intentions, and current pro-environmental behaviors as a necessary predictor of pro-environmental behavior change. Just as old behavior patterns are identified as barriers to pro-environmental behaviors, the opposite is also true: Individuals who already engage in a number of pro-environmental behaviors are most likely to adopt new behaviors to reduce their ecological footprint and increase their sustainability efforts. These findings are consistent with the literature on understanding the motives and barriers to pro-environmental behavior. The findings from this study also indicate a number of considerations for future research aimed at investigating the role of emotion in motivating pro-environmental behavior change.

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## APPENDIX A: Research Study Phase 1

### Environmental Decision Making

**Purpose of the Research:** The purpose of this research is to investigate how people make decisions about the environment. Research suggests that a number of human behaviors are responsible for environmental degradation, so we believe it is important to understand how individuals' behavior may influence sustainability efforts.

**Procedures:** This study will be conducted online. If you decide to continue, you will need to complete two (2) separate surveys--the first one now, and the second survey in one (1) month. Both surveys will ask about your environmental attitudes and behaviors. In this first study, you will be asked to complete a number of measures to identify your attitudes, emotions, and behaviors about and toward the environment. You will also be asked to watch a brief video, and then provide some demographic information about yourself. The first survey will take about 30-45 minutes to complete. In the second study, you will be asked a number of follow-up questions regarding your environmentally-related behaviors. The second survey will take approximately 15 minutes to complete.

**Risks and/or Discomforts:** In this research study, you may watch emotionally arousing film clips that could cause distress due to the content. This exposure, however, is not more than what you might expect to see on television or in other mass media ventures, and will last only a short time (e.g., less than 5 minutes). You are free to discontinue participation at any point during the survey without penalty. There are no other known risks or discomforts associated with this research.

In the unfortunate event that you have some lingering uncomfortable feelings because of this, psychological treatment is available on a sliding fee scale at the UNL Psychological Consultation Center at 402/472-2351, or at the Counseling and Psychological Services at 402/472-7450.

**Benefits:** You may find the learning experience afforded by your participation in this research enjoyable and interesting. The information gained from this study will help us to better understand participant perceptions of and reactions to environmental propaganda. In addition, this research will generally contribute to the understanding of how people make decisions about environmental sustainability.

**Confidentiality:** This study is confidential and the researcher will not ask you for any identifying information that may connect you to your answers, including your name. The data, however, will include your email address for a brief time in order to track your survey responses from survey to survey. These email addresses will be immediately destroyed when the two surveys are combined at the completion of the second survey. The information collected from this study will be kept on a secure password-protected

server, with only approved researchers having access. Data will be kept during the study and for at least three years after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings but the data will be reported as aggregated data.

Compensation: Participants will be compensated 2 research credits (students; community participants received \$1.00 per survey) for completing both surveys. Please note: you will not be compensated until you have completed both surveys.

Opportunity to Ask Questions: You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during or after the study, by contacting Hannah Dietrich via email at [hdietrich@unl.edu](mailto:hdietrich@unl.edu), or by phone at (402) 472-0686, or Dr. Brian Bornstein via email at [bbornstein2@unl.edu](mailto:bbornstein2@unl.edu), or by phone at (402) 472-3743.

Whom to contact about your rights as a research participant in this study: If you have questions concerning your rights as a research subject that have not been answered by the investigator or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Freedom to Withdraw: You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or the University of Nebraska. Your decision will not result in any loss or benefits to which you are otherwise entitled.

Consent, Right to Receive a Copy: You are voluntarily making a decision whether or not to participate in this research study. You can refuse to participate or withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefit to which you are otherwise entitled. Your endorsement certifies that you have decided to participate, having read and understood the information presented. You may print a copy of this consent form to keep for your records.

Consent to Participate: If you agree to participate, please click on the double arrow button below to proceed with the study. If you do not wish to participate, please exit out of your Internet browser now. If you would like a copy of this consent form, please click your Internet browser's print button, or as the researcher for a copy.

Investigator: Hannah Dietrich, M.A. | Principal Investigator | Email: [hdietrich@unl.edu](mailto:hdietrich@unl.edu) | Office: 402/472-0686

Brian H. Bornstein, Ph.D. | Secondary Investigator | Email: [bbornstein2@unl.edu](mailto:bbornstein2@unl.edu) | Office: 402/472-3743

1. As outlined on the previous page, we will need your email address to track your responses from this first survey to the second. As a reminder, your email addresses will be immediately destroyed when the two surveys are combined at the completion of the second survey. To ensure that you receive the second survey, ensuring compensation for your participation, please provide your email address in the space below:

2. Please verify your email address:

3. Use your cursor to slide the bar along the line to indicate your current mood, using the face as a gauge. For example, if you are in a very positive mood, you would move the sliding bar to the far right, revealing an extremely smiley face. If you are in a very negative mood, you would move the sliding bar to the far left, revealing an extremely frowned face. If you feel neither happy nor sad, you may choose to leave the sliding bar in the center.

☐ 1 (1)

☐ 2 (2)

☐ 3 (3)

☐ 4 (4)

☐ 5 (5)

### Environmental Identity Scale

4. Using a scale of 1 (strongly disagree) to 5 (strongly agree), please rate the extent to which you agree or disagree with the following statements.

|   | Strongly<br>Disagree<br>(1) | Disagree<br>(2)       | Neither<br>Disagree<br>nor Agree<br>(3) | Agree (4)             | Strongly<br>Agree (5) |
|---|-----------------------------|-----------------------|---|-----------------------|-----------------------|
| I spend a lot of time in natural settings (woods, mountains, desert, lakes, ocean). (1) | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                   | <input type="radio"/> | <input type="radio"/> |
| Engaging in environmental behaviors is important to me. (2)                             | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                   | <input type="radio"/> | <input type="radio"/> |
| I think of myself   | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/>                   | <input type="radio"/> | <input type="radio"/> |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| as a part of nature, not separate from it (3)   |                       |                       |                       |                       |                       |
| If I had enough time or money, I would certainly devote some of it to working for environmental causes. (4)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| When I am upset or stressed, I can feel better by spending some time outdoors “communing with nature”. (5)    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Living near wildlife is important to me; I would not want to live in a city all the time. (6)                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have a lot in common with environmentalists as a group. (7)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I believe that some of today’s social problems could be cured by returning to a more rural lifestyle in which | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| people live in harmony with the land. (8)  |                       |                       |                       |                       |                       |
| I feel that I have a lot in common with other species. (9)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| My own interests usually seem to coincide with the position advocated by environmentalists. (10)                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Being a part of the ecosystem is an important part of who I am. (11)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel that I have roots to a particular geographical location that had a significant impact on my development. (12) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel that my own interests will sometimes be in conflict with the goal of preserving the environment. (13)         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Behaving responsibly   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| toward the earth –<br>living a<br>sustainable<br>lifestyle – is a<br>part of my moral<br>code. (14)  |                       |                       |                       |                       |                       |
| Learning about<br>the natural world<br>should be an<br>important part of<br>every child's<br>upbringing. (15)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| In general, being<br>part of the natural<br>world is an<br>important part of<br>my self-image.<br>(16)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I don't pay much<br>attention to<br>environmental<br>issues. (17)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would rather<br>live in a small<br>room or house<br>with a nice view<br>than a bigger<br>room or house<br>with a view of<br>other buildings.<br>(18) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I really enjoy<br>camping and<br>hiking outdoors.<br>(19)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sometimes I feel like parts of nature – certain trees, or storms, or mountains – have a personality of their own. (20)           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would feel that an important part of my life was missing if I was not able to get out and enjoy nature from time to time. (21) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I take pride in the fact that I could survive outdoors on my own for a few days. (22)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have never seen a work of art that is as beautiful as a work of nature, like a sunset or a mountain range. (23)                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I like to garden. (24)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel that I receive spiritual sustenance from nature. (25)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I keep mementos from the outdoors  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| in my room, like shells or rocks or feathers. (26)   |                       |                       |                       |                       |                       |
| I don't really care what part of the country I live in. I don't pay much attention to my surroundings. (27)                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| When I am in a natural setting the needs and demands of others seem to fade away and I can think about what is important to me. (28) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

### New Ecological Paradigm

5. Listed below are statements about the relationship between humans and the environment. Please indicate the degree to which you agree with each item. Choose your response for each statement using the drop-down menu.

|   | Strongly Disagree (1) | Mildly Disagree (2)   | Unsure (3)            | Mildly Agree (4)      | Strongly Agree (5)    |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| We are approaching the limit of the number of people the earth can support. (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Humans have   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |



|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| the right to modify the natural environment to suit their needs. (2)                |                       |                       |                       |                       |                       |
| When humans interfere with nature, it often produces disastrous consequences. (3)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Human ingenuity will insure that we do not make the earth unlivable. (4)            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Humans are severely abusing the earth. (5)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The earth has plenty of natural resources if we just learn how to develop them. (6) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Plants and animals have as much right   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| as humans to exist. (7)   |   |   |   |   |   |
| The balance of nature is strong enough to cope with the impacts of modern industrial nations. (8) | ○ | ○ | ○ | ○ | ○ |
| Despite our special abilities, humans are still subject to the laws of nature. (9)                | ○ | ○ | ○ | ○ | ○ |
| The so-called "ecological crisis" facing humankind has been greatly exaggerated. (10)             | ○ | ○ | ○ | ○ | ○ |
| The earth is like a spaceship with very limited room and resources. (11)                          | ○ | ○ | ○ | ○ | ○ |
| Humans were meant to rule over the rest   | ○ | ○ | ○ | ○ | ○ |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| of nature. (12)   |                       |                       |                       |                       |                       |
| The balance of nature is very delicate and easily upset. (13)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Humans will eventually learn enough about how nature works to be able to control it. (14)                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If things continue on their present course, we will soon experience a major environmental catastrophe. (15) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

### Environmental Connectivity Scale

6. Based on how you actually feel, use the slider gauge to indicate the extent to which you agree with each item, where 1 = strongly disagree, and 5 = strongly agree.

\_\_\_\_\_ I see myself as part of a larger whole in which everything is connected by a common essence. (1)

\_\_\_\_\_ I feel a sense of oneness with nature. (2)

\_\_\_\_\_ The world is not merely around us but within us. (3)

\_\_\_\_\_ I never feel a personal bond with things in my natural surroundings, like trees, a stream, wildlife, or the view on the horizon. (4)

### Interpersonal Reactivity Index

7. The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you using the scale provided. Read each item carefully before responding. Answer as honestly as you can.

|  | Does not<br>describe me<br>well (1) | (2)                   | (3)                   | (4)                   | Describes<br>me very well<br>(5) |
|--|-------------------------------------|-----------------------|-----------------------|-----------------------|----------------------------------|
| I daydream<br>and fantasize,<br>with some<br>regularity,<br>about things<br>that might<br>happen to<br>me. (1) | <input type="radio"/>               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            |
| I often have<br>tender,<br>concerned<br>feelings for<br>people less<br>fortunate than<br>me. (2)               | <input type="radio"/>               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            |
| I sometimes<br>find it<br>difficult to<br>see things<br>from the<br>"other guy's"<br>point of view.<br>(3)     | <input type="radio"/>               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            |
| Sometimes I<br>don't feel<br>very sorry for<br>other people<br>when they are<br>having                         | <input type="radio"/>               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>            |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| problems. (4)  |                       |                       |                       |                       |                       |
| I really get involved with the feelings of the characters in a novel. (5)                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| In emergency situations, I feel apprehensive and ill-at-ease. (6)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (7) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I try to look at everybody's side of a disagreement before I make a decision. (8)                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| When I see someone being taken advantage of,   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I feel kind of protective towards them. (9)  |                       |                       |                       |                       |                       |
| I sometimes feel helpless when I am in the middle of a very emotional situation. (10)                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I sometimes try to understand my friends better by imagining how things look from their perspective (11) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Becoming extremely involved in a good book or movie is somewhat rare for me. (12)                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| When I see someone get hurt, I tend to remain calm. (13)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Other people's misfortunes do not usually disturb me a great deal.<br>(14)                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.<br>(15) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| After seeing a play or movie, I have felt as though I were one of the characters.<br>(16)                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Being in a tense emotional situation scares me.<br>(17)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| When I see someone being treated unfairly, I  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| sometimes<br>don't feel<br>very much<br>pity for them.<br>(18)  |                       |                       |                       |                       |                       |
| I am usually<br>pretty<br>effective in<br>dealing with<br>emergencies.<br>(19)                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am often<br>quite touched<br>by things that<br>I see happen.<br>(20)                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I believe that<br>there are two<br>sides to every<br>question and<br>try to look at<br>them both.<br>(21) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would<br>describe<br>myself as a<br>pretty soft-<br>hearted<br>person. (22)                             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| When I watch<br>a good<br>movie, I can<br>very easily<br>put myself in<br>the place of a                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |



|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <p>leading character.<br/>(23)</p>   |                       |                       |                       |                       |                       |
| <p>I tend to lose control during emergencies.<br/>(24)</p>   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <p>When I'm upset at someone, I usually try to "put myself in his shoes" for a while.<br/>(25)</p>                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <p>When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (26)</p> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <p>When I see someone who badly needs help in an emergency, I go to pieces.<br/>(27)</p>   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |   |   |   |   |   |
|--|---|---|---|---|---|
| Before<br>criticizing<br>somebody, I<br>try to imagine<br>how I would<br>feel if I were<br>in their place.<br>(28) | ○ | ○ | ○ | ○ | ○ |
|--|---|---|---|---|---|

### Ecological Footprint Measure

The following questions will ask about your current behaviors related to the environment.

8. How many miles per week do you drive your car?

- ☐ 1-10 (1)
- ☐ 11-20 (2)
- ☐ 21-50 (3)
- ☐ 50-100 (4)
- ☐ More the 100 (5)
- ☐ I do not own a car. (6)

9. Please select the measures you take to save energy in your home (choose all that apply):

- ☐ Compact fluorescent bulbs (1)
- ☐ Energy efficient appliances (2)
- ☐ Extra insulation (3)
- ☐ Insulating blinds (4)
- ☐ Solar panels (5)
- ☐ Storm doors and windows (6)
- ☐ Water saving fixtures (7)
- ☐ Other (8) \_\_\_\_\_

10. Please select your energy saving habits (choose all that apply):

- ☐ Turn off lights when leaving rooms (1)
- ☐ Use power strips to turn off stand-by lights (2)
- ☐ Turn off computers and monitors when not in use (3)
- ☐ Dry clothes outside whenever possible (4)
- ☐ Keep thermostat relatively low in winter (5)
- ☐ Unplug small appliances when not in use (6)
- ☐ Minimal use of power equipment when landscaping (7)
- ☐ Other (8) \_\_\_\_\_

11. Which of the following best describes your diet (choose only one)?

- ☐ Vegan – Plant based foods only (1)
- ☐ Vegetarian – Primarily plant based foods, but some dairy (2)
- ☐ Seafood, but no meat (e.g., chicken, pork and beef) (3)
- ☐ Seafood and poultry (e.g., chicken/turkey) but no red meat (4)
- ☐ Most all kinds of meat (beef, pork, seafood, and/or poultry, etc.) (5)
- ☐ Other (please specify) (6) \_\_\_\_\_

12. How often do you purchase foods that are certified organic or fair trade?

- ☐ Never (1)
- ☐ Sometimes (2)
- ☐ Most of the time (3)
- ☐ Always (4)

13. What portion of the following do you recycle?

|                    | None (1)              | Some (2)              | A fair amount<br>(3)  | Almost all (4)        |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Paper (1)          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aluminum<br>(2)    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Glass (3)          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Plastic (4)        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Electronics<br>(5) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

14. Please press the "play" button below to watch the video.

15. Did you watch the entire video?

☐ Yes (1)

☐ No (2)

16. Did you have any problems loading or playing the video?

☐ Yes (1)

☐ No (2)

### Positive and Negative Affect Scale

17. This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer using the scale provided. Indicate to what extent you feel this way right now, that is, at the present moment.

|                     | Very<br>slightly or<br>not at all (1) | A little (2)          | Moderately<br>(3)     | Quite a bit<br>(4)    | Extremely<br>(5)      |
|---------------------|---------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Interested (1)      | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Distressed<br>(2)   | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Excited (3)         | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Upset (4)           | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Strong (5)          | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Guilty (6)          | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scared (7)          | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Hostile (8)         | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Enthusiastic<br>(9) | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Proud (10)          | <input type="radio"/>                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|                    |                       |                       |                       |                       |                       |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Irritable (11)     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Alert (12)         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ashamed<br>(13)    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Inspired (14)      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Nervous (15)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Determined<br>(16) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Attentive<br>(17)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Jittery (18)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Active (19)        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Afraid (20)        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Elated (21)        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Fearful (22)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Nervous (23)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Content (24)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Dull (25)          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Relaxed (26)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Calm (27)          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Sluggish (28)      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Euphoric<br>(29)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|                 |                       |                       |                       |                       |                       |
|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Annoyed<br>(30) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|

### Filler Task

18. Please read the following short passage from a novel. When you have finished reading, click "Continue" below.

The automobile swung clumsily around the curve in the red sandstone trail, now a mass of mud. The headlights suddenly picked out in the night—first on one side of the road, then on the other—two wooden huts with sheet metal roofs. On the right near the second one, a tower of course beams could be made out in the light fog. From the top of the tower a metal cable, invisible at its starting-point, shone as it sloped down into the light from the car before disappearing behind the embankment that blocked the road. The car slowed down and stopped a few yards from the huts.

The man who emerged from the seat to the right of the driver labored to extricate himself from the car. As he stood up, his huge, broad frame lurched a little. In the shadow beside the car, solidly planted on the ground and weighed down by fatigue, he seemed to be listening to the idling motor. Then he walked in the direction of the embankment and entered the cone of light from the headlights. He stopped at the top of the slope, his broad back outlined against the darkness. After a moment he turned around. In the light from the dashboard he could see the chauffeur's black face, smiling. The man signaled and the chauffeur turned off the motor. At once a vast cool silence fell over the trail and the forest. Then the sound of the water could be heard.

The man looked at the river below him, visible solely as a broad dark motion flecked with occasional shimmers. A denser motionless darkness, far beyond, must be the other bank. By looking fixedly, however, one could see on that still bank a yellowish light like an oil lamp in the distance. The big man turned back toward the car and nodded. The chauffeur switched off the lights, turned them on again, then blinked them regularly. On the embankment the man appeared and disappeared, taller and more massive each time he came back to life. Suddenly, on the other bank of the river, a lantern held up by an invisible arm back and forth several times. At a final signal from the lookout, the man disappeared into the night. With the lights out, the river was shining intermittently. On each side of the road, the dark masses of forest foliage stood out against the sky and seemed very near. The fine rain that had soaked the trail an hour earlier was still hovering in the warm air, intensifying the silence and immobility of this broad clearing in the virgin forest. In the black sky misty stars flickered.

19. Using the scale below (where 1 = not at all descriptive, and 9 = very descriptive), how do you feel about the overall descriptive qualities of the novel excerpt you read?

- ☐ 1 = Not at all descriptive (1)
- ☐ 2 (3)
- ☐ 3 (4)
- ☐ 4 (5)
- ☐ 5 = Somewhat descriptive (6)
- ☐ 6 (7)
- ☐ 7 (8)
- ☐ 8 (9)
- ☐ 9 = very descriptive (10)

20. Do you think the author of this story is a male or female?

- ☐ I think the author is a male. (1)
- ☐ I think the author is a female. (2)

21. Using the scale below, please indicate how important environmental issues (e.g., climate change, pollution, resource depletion, etc.) are to you.

- ☐ Not at all important (1)
- ☐ Very Unimportant (2)
- ☐ Somewhat Unimportant (3)
- ☐ Neither Important nor Unimportant (4)
- ☐ Somewhat Important (5)
- ☐ Very Important (6)
- ☐ Extremely Important (7)

22. Do you think it is important to engage in pro-environmental behaviors?

22a. Why do you think it is important to engage in pro-environmental behaviors?

22b. Why do you not think it is important to engage in pro-environmental behaviors?

### **Behavioral Change Intentions**

23. Based on your concern for the environment, how likely are you to:

|   | Very<br>Unlikely (1)  | Somewhat<br>Unlikely (2) | Undecided<br>(3)      | Somewhat<br>Likely (4) | Very<br>Likely (5)    |
|---|-----------------------|--------------------------|-----------------------|------------------------|-----------------------|
| Reduce your<br>meat<br>consumption<br>(1) | <input type="radio"/> | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>  | <input type="radio"/> |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Eat more local foods (2)                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Eat more organic or fair trade foods (3) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ride your bike or walk more (4)          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Recycle more (5)                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

### **Students' Willingness to Commit to a Public Pro-Environmental Behavior**

#### **24a. GET INVOLVED... Recycling at UNL!**

The mission of UNL Recycling is to promote waste reduction, reuse, and recycling while educating students, faculty, and staff on how to make simple lifestyle changes that positively impact local and global natural environments through voluntary partnership with our program. In 2011 UNL recycled 41.0% of its waste. The national average of waste that campuses and universities recycle per year is 26%; let's continue to strive to increase our percentage at UNL!

As a result of your recycling efforts we have saved:

- 6,796+.... Cubic yards of Landfill Space
- 35,007+.... Trees
- 123,554+.... Eliminated pounds of Air Pollution
- 8,442,888+.... KW Hours of Electricity
- 1,441,687+.... Gallons of Water
- 4118+.... Barrels of Oil

Do YOU want to get involved with recycling events at UNL? Help make UNL more "green" by volunteering to participate in on-campus recycling events, such as "Recyclemania" (held each Spring in conjunction with Earth Day), and "Go Green for Big Red" (held each Fall in conjunction with Husker game days). To indicate your interest in getting involved with these campus sustainability events, simply enter your



email address in the textbox below. Your email address will be shared with the UNL Recycling Coordinators, Jeff Henson and Prabhakar Shrestha, who will contact you for more information on how you can help UNL "green" at campus recycling events.

### **Community Participants' Willingness to Commit to a Public Pro-Environmental Behavior**

#### **24b. Sign the Petition! Tell the EPA to Stop the Pebble Mine and Save Bristol Bay**

Global mining companies want to gouge the continent's biggest, open-pit gold and copper mine out of the spectacular wilderness above Alaska's Bristol Bay. A long-awaited study by the Environmental Protection Agency has confirmed that the Pebble Mine - and its estimated 10 billion tons of mining waste - would pose catastrophic risks to Bristol Bay, along with its legendary salmon runs, its abundant wildlife and its Native communities.

Global mining companies have already spent \$100 million on this scheme. They are fighting back hard, attacking the EPA and pressuring the White House. The time has come for the EPA to exercise its authority under the Clean Water Act and stop this disastrous mega-mine.

Make your voice heard immediately. Sign the petition to the EPA, calling on the agency to save this national treasure by prohibiting the Pebble Mine!

Are you willing to sign the petition?

- ☐ Yes (1)
- ☐ No (2)

**Answer If Yes Is Selected**

To sign the petition to "Stop the Pebble Mine and Save Bristol Bay," open a new tab in your Internet browser and simply copy and paste the link below into the address bar. Link to sign the petition: <http://www.thepetitionsite.com/takeaction/379/638/930/>

25. Please provide some basic demographic information about yourself. Please respond honestly to each item.

26. Please select your gender.

- ☐ Male (1)
- ☐ Female (2)

27. Please enter your age in years.

28. Please select your political affiliation

- ☐ Democrat (1)
- ☐ Republican (2)
- ☐ Independent (3)
- ☐ Other (Please specify) (4) \_\_\_\_\_
- ☐ I do not wish to disclose (5)

29. Please select the religious group that you relate to most.

- ☐ Christianity (1)
- ☐ Islam (2)
- ☐ Hinduism (3)
- ☐ Buddhism (4)
- ☐ Judaism (5)
- ☐ Agnosticism (6)
- ☐ Atheist (7)
- ☐ Other ( Please specify) (8) \_\_\_\_\_
- ☐ I do not wish to disclose (9)

30. What is your academic major (if applicable)? (*Students only*)

## APPENDIX B: Research Study Phase 2

1. To ensure that we are able to compensate you for your participation, please provide your email address below. This will also allow us to link up your responses from the first survey. As a reminder, your email will be immediately destroyed when the two surveys are combined at the completion of the second survey.

Please enter your email address in the space provided:

2. Please confirm your email address:

3. This first set of questions will ask you about your attitudes and beliefs about the environment and environmental issues.

4. Using a scale of 1 (strongly disagree) to 5 (strongly agree), please rate the degree to which you agree or disagree with each statement.

|  | Strongly<br>disagree (1) | Disagree (2)          | Neither<br>Agree nor<br>Disagree (3) | Agree (4)             | Strongly<br>Agree (5) |
|--|--------------------------|-----------------------|--------------------------------------|-----------------------|-----------------------|
| If things<br>continue on<br>their present<br>course, we<br>will soon<br>experience a<br>major<br>ecological<br>catastrophe.<br>(1) | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| The problems<br>of the<br>environment<br>are not as bad<br>as most<br>people think.<br>(2)   | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |
| We are fast<br>using up the<br>world's<br>natural  | <input type="radio"/>    | <input type="radio"/> | <input type="radio"/>                | <input type="radio"/> | <input type="radio"/> |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| resources. (3)  |                       |                       |                       |                       |                       |
| People worry too much about human progress harming the environment. (4)           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| We are spending too little money on improving and protecting the environment. (5) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

5. Which one of these do you believe should have the primary responsibility for protecting the environment in our nation?

- ☐ the government, business and industry (1)  
☐ individual citizens and citizen's groups (2)

6. Below is a list of possible causes of the nation's environmental problems. Using the scale provided, please indicate how much you think each contributes to the environmental problems in our nation.

|   | Not at all (1)        | Not very much (2)     | Fair amount (3)       | A great deal (4)      |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Overpopulation--there are too many people using up resources (1)    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Our government--it does not place enough emphasis on protecting the | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| environment (2)  |                       |                       |                       |                       |
| Waste--<br>individuals use<br>more resources<br>than they need<br>and throw away<br>too much (3)                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of<br>education--<br>people just don't<br>know what to do<br>to protect the<br>environment (4)                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Business and<br>industry--they<br>care more about<br>growth than<br>protecting the<br>environment (5)              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Technology--the<br>way products are<br>made uses too<br>many resources<br>and creates too<br>much pollution<br>(6) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

7. The table below lists a number of possible actions our government could take to help solve our nation's environmental problems. Keeping in mind that there are costs associated with each of these actions, indicate the extent to which you favor (or do not favor) the listed action.

|   | Strongly<br>oppose (1) | Somewhat<br>oppose (2) | Somewhat<br>favor (3) | Strongly favor<br>(4) |
|---|------------------------|------------------------|-----------------------|-----------------------|
| Make stronger<br>environmental<br>protection laws<br>for business and | <input type="radio"/>  | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| industry (1)   |                       |                       |                       |                       |
| Make laws requiring that all citizens conserve resources and reduce pollution (2)                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Provide family planning information and free birth control to all citizens who want it, to help reduce birth rates (3) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Support scientific research to help find new ways to control pollution (4)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Limit exports of our natural resources to other nations (5)  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ban the sale of products that are unsafe for the environment (6)   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

8. In your opinion, how much of an effect can individual citizens and citizens' groups have on solving our environmental problems?

- ☐ Not at all (1)
- ☐ Not very much (2)
- ☐ A fair amount (3)
- ☐ A great deal (4)

9. Presented in the table below is a list of environmental issues that may be affecting the world as a whole. Using the scale provided, indicate how serious a problem you personally believe it to be in the world.

|  | Not at all<br>serious (1) | Not very<br>serious (2) | Somewhat<br>serious (3) | Very<br>serious (4)   | I don't know<br>enough<br>about it to<br>make a<br>judgment (5) |
|--|---------------------------|-------------------------|-------------------------|-----------------------|---|
| Air pollution<br>and smog (1)                                  | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>   |
| Pollution of<br>rivers, lakes,<br>and oceans<br>(2)            | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>   |
| Soil erosion,<br>polluted land,<br>and loss of<br>farmland (3) | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>   |
| Loss of<br>animal and<br>plant species<br>(4)                  | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>   |
| Loss of rain<br>forests and<br>jungles (5)                     | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>   |
| Global<br>warming or<br>the                                    | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>   |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| "greenhouse effect" (6)                      |                       |                       |                       |                       |                       |
| Loss of ozone and the Earth's atmosphere (7) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

### Ecological Footprint Measure (Post-Measure)

The following questions will ask about your current behaviors related to the environment.

10. How many rooms are there per person in your living situation? To calculate, divide the total number of ALL rooms (including the bathroom, kitchen, dining room, etc.) in the house by the number of people living in the home.

- ☐ Fewer than 2 rooms per person (1)
- ☐ 2-3 rooms per person (2)
- ☐ 4-6 rooms per person (3)
- ☐ 7 or more rooms per person (4)

11. What is your current household (taxable) income? If you live with roommates (e.g., people you do not claim, or who cannot claim you, on your (their) taxes), report only your income.

- ☐ Less than \$10,000/year (1)
- ☐ Between \$10,000-\$29,999 per year (2)
- ☐ Between \$30,000 and \$59,999 per year (3)
- ☐ Between \$60,000 and \$90,000 per year (4)
- ☐ More than \$90,000 per year (5)
- ☐ I do not wish to disclose. (6)

12. Please select the measures you take to save energy in your home (choose all that apply):

- ☐ Compact fluorescent bulbs (1)
- ☐ Energy efficient appliances (2)
- ☐ Extra insulation (3)
- ☐ Insulating blinds (4)
- ☐ Solar panels (5)
- ☐ Storm doors and windows (6)



- ☐ Water saving fixtures (7)
- ☐ Other (8) \_\_\_\_\_

13. Please select your energy saving habits (choose all that apply):

- ☐ Turn off lights when leaving rooms (1)
- ☐ Use power strips to turn off stand-by lights (2)
- ☐ Turn off computers and monitors when not in use (3)
- ☐ Dry clothes outside whenever possible (4)
- ☐ Keep thermostat relatively low in winter (5)
- ☐ Unplug small appliances when not in use (6)
- ☐ Minimal use of power equipment when landscaping (7)
- ☐ Other (8) \_\_\_\_\_

14. Which of the following best describes your diet (choose only one)?

- ☐ Vegan – Plant based foods only (1)
- ☐ Vegetarian – Primarily plant based foods, but some dairy (2)
- ☐ Seafood, but no meat (e.g., chicken, pork and beef) (3)
- ☐ Seafood and poultry (e.g., chicken/turkey) but no red meat (4)
- ☐ Most all kinds of meat (beef, pork, seafood, and/or poultry, etc.) (5)
- ☐ Other (please specify) (6) \_\_\_\_\_

15. How often do you purchase foods that are certified organic or fair trade?

- ☐ Never (1)
- ☐ Sometimes (2)
- ☐ Most of the time (3)
- ☐ Always (4)

16. What portion of the following do you recycle?

|                 | None (1)              | Some (2)              | A fair amount<br>(3)  | Almost all (4)        |
|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Paper (1)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aluminum<br>(2) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Glass (3)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Plastic (4)     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|                    |                       |                       |                       |                       |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Electronics<br>(5) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|

17. How many miles per week do you drive your car?

- ☐ 1-10 (1)  
☐ 11-20 (2)  
☐ 21-50 (3)  
☐ 50-100 (4)  
☐ More the 100 (5)  
☐ I do not own a car. (6)

18. In the past month (or, since you took the first survey in this research study), have you:

|  | Yes (1)               | No (2)                |
|--|-----------------------|-----------------------|
| Reduced your meat consumption (1)                    | <input type="radio"/> | <input type="radio"/> |
| Eaten/purchased more local foods (2)                 | <input type="radio"/> | <input type="radio"/> |
| Eaten/purchased more organic or fair trade foods (3) | <input type="radio"/> | <input type="radio"/> |
| Rode your bike or walked more (4)                    | <input type="radio"/> | <input type="radio"/> |
| Recycled more (5)                                    | <input type="radio"/> | <input type="radio"/> |
| Changed your thermometer setting to save energy (6)  | <input type="radio"/> | <input type="radio"/> |
| Other (please specify) (7)                           | <input type="radio"/> | <input type="radio"/> |

19. Using the scale below, please indicate how important environmental issues (e.g., climate change, pollution, resource depletion, etc.) are to you.

- ☐ Not at all important (1)

- ☐ Very Unimportant (2)
- ☐ Somewhat Unimportant (3)
- ☐ Neither Important nor Unimportant (4)
- ☐ Somewhat Important (5)
- ☐ Very Important (6)
- ☐ Extremely Important (7)