

EXPLORING DIRECT AND INDIRECT ANTECEDENTS OF SELF-REPORTED
ECOLOGICAL BEHAVIORS

A Thesis

Presented to the

Faculty of the Graduate School of

Angelo State University

In Partial Fulfillment of the

Requirements for the Degree

MASTER OF SCIENCE

by:

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May 2012

Major: Industrial/Organizational Psychology

EXPLORING DIRECT AND INDIRECT ANTECEDENTS OF SELF-REPORTED
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ACKNOWLEDGEMENTS

I would like to express my gratitude to Dr. Cheryl Stenmark for serving as my thesis chair. Over the past two years, and especially during the thesis process, your unwavering support, kindness, and patience have helped me develop on both an academic and personal level. I have been very fortunate and grateful to have you as my mentor. I would also like to thank Dr. Kraig Schell for his guidance throughout the past two years, and particularly for his patience and support in the beginning stages of this process. I would also like to thank the other members of my Advisory Committee: Dr. Kristi Cordell-McNulty and Dr. Christine Purkiss. Finally, I would also like to express my love and gratitude to my parents: Cindy and Dub McClister. I am grateful to both of you for helping me become the person I am today, and for your constant support throughout this process.

ABSTRACT

The current study examined the direct and indirect antecedents of participation in ecological behavior. Specifically, it was hypothesized that promotion and prevention orientation would both significantly predict ecological behavior, and that hope and optimism would partially mediate these relationships. The results revealed that a promotion orientation significantly predicted pro-social behavior, but the hypothesized mediation was not significant. However, post-hoc analyses revealed that hope predicted pro-social behavior and that the relationship was mediated by a promotion orientation. Implications, limitations, and directions for future research are also discussed.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	iii
ABSTRACT.....	iv
TABLE OF CONTENTS.....	v
LIST OF FIGURES	vii
LIST OF TABLES.....	viii
INTRODUCTION	1
The History of Sustainable Development	3
Economic Sustainability.....	4
Social Sustainability.....	5
Environmental sustainability.....	5
Organizational Relevance	6
Regulatory Focus.....	8
Optimism/Pessimism.....	10
Hope	13
METHOD	17
Participants	17
Measures.....	17
Procedure.....	20
RESULTS	20
Optimism.....	24

Hope	24
DISCUSSION	28
REFERENCES	38
APPENDIX A	45
APPENDIX B	46
APPENDIX C	49
APPENDIX D	51
APPENDIX E	52
VITA	53

Exploring Direct and Indirect Antecedents of Self-Reported Ecological Behavior

In 1983, the United Nations formed a committee known as the World Conference on Environment and Development (WCED, often referred to as the Brundtland Commission) in order to address growing concerns related to worldwide poverty and environmental degradation. This committee advanced the concept of sustainable development in pursuit of that goal. Disastrous events such as the 1986 Chernobyl nuclear accident in Ukraine (that led to large amounts of radioactive carbon being released into the atmosphere) intensified the need for a plan to restore the fragile balance between the environment and the basic needs of the human race. In response to these incidents, the WCED published a report in 1987 entitled, *Our Common Future* in which sustainable development is defined as, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 8).

Gardner and Stern (2002) report that 68% of energy is consumed by industrial and commercial services in the United States. As those responsible for the majority of energy consumption, it is then, also the responsibility of such organizations to become leaders in the implementation of sustainability practices. Changes made in organizational structure and practice designed to improve sustainability are likely to have a significant impact on employees. Those organizations wishing to embed sustainable practices into their culture will need to educate employees on the value of participation in such practices because

individuals tend to act in accordance with what they value. If employees do not see the value in participating, they will be unlikely to do so consistently (Hofstede, 1984; as cited in Pinto, et al., 2011). Additionally, organizations will likely be implementing changes that will fall primarily into the hands of employees. It is important to understand how these changes will affect the satisfaction, health, and lifestyle of the organization's employees. Scherbaum, Popovich, & Finlinson (2008) point out how all too often organizations overlook the necessity of the behavioral changes (in employees and managers alike) required to fully support structural (or other operational) changes. The present research can help drive the goals of sustainability forward by establishing what relationship exists between individual differences inherent to human behavior and the desire to improve the environment through behavior that is environmentally friendly.

There has been considerable research examining what variables motivate people to participate in ecological behavior in the first place. For example, Roberts and Bacon (1997) demonstrated that individual values and attitudes regarding environmental issues might facilitate or inhibit participation in ecological behavior. Specifically, they found that individuals who value nature are more likely to engage in ecologically conscious consumerism. Howard (2000) also proposed the amount of sacrifice involved as an important factor considered at the individual level when choosing to participate (or not to participate) in ecological behavior. These (and most related studies) have been conducted in the context of households and consumers. Unfortunately, the determinants of behavior in household settings are likely to differ from the determinants of behavior in an organizational setting (Stern, 2000). While the previous examples provide valuable guidance, the argument

made by Stern also demonstrates the importance of examining this relationship between individual differences and ecological behavior in a way that is relevant to the organizational setting. For this reason, the present research considers individual difference variables that may assist in the development of communication methods that will effectively motivate employees to value sustainability.

The History of Sustainable Development

Concerns about degradation of the environment, and ideas about ways in which to fix these problems began circulating over 40 years ago. One of the first mandates was developed by the International Union for the Conservation of Nature (IUCN). In 1969, the IUCN spoke of the importance of enhancing the natural environment and managing natural resources in a way that would achieve sustainable quality of life for all people. The United Nations (UN) began working diligently to make sustainable development an important part of governments worldwide; they began by introducing sustainable development as an important theme of their Conference on the Human Environment held in Stockholm, Sweden in 1972.

Since 1987, there have been many conferences to discuss sustainable development such as the UN Conference on Environment and Development held in Rio de Janeiro, Brazil in 1992 (commonly referred to as the “Earth Summit”). The message promoted by the summit was that the people of the world needed to transform their attitudes and behavior to bring about necessary changes to halt the destruction of the environment. This message, received by millions of people worldwide, highlighted the complexity of problems facing us

such as poverty and excessive consumption by developed countries. The summit reported that governments were recognizing the need to restructure plans and policies so that economic decisions fully accounted for environmental impact. They also reported that, fortunately, these plans had been put into action; many businesses and governments have made eco-efficiency a guiding principle. In 2006 the IUCN met again to discuss issues of sustainability in the twenty-first century. Adams (2006) detailed the discussions that went on during this meeting; he points out that becoming a ‘green’ business has become a hot topic for many global companies, but it has yet to drive organizations to institute structural changes needed within the business to fully implement sustainability. Industrial-Organizational (I-O) psychologists may help facilitate these important structural changes by researching the fundamental characteristics required by people employed in ‘green’ businesses.

In the literature, sustainable development is most commonly divided into three dimensions: economic, social, and environmental. These dimensions are often referred to as the “three pillars of sustainable development.”

Economic Sustainability

For organizations around the world economic prosperity is often the foremost purpose of creating and maintaining their business. As stated by Haugh and Talwar (2010), “Economic sustainability is fundamental to corporate financial success—in the long run the corporation simply cannot survive if expenditure exceeds income” (p. 385). If an organization is not managed in a way that is economically sustainable, the organization will

inevitably fail. As such, economic sustainability is typically an organization's foremost concern.

Social Sustainability

Generally, social sustainability is defined as recognizing the value and dignity of every human life, and ensuring fair access to goods and services that allows all people to maintain an acceptable quality of life. It also includes action by governments, organizations, leaders, and individual citizens to act morally and fairly to fellow human beings. This concept has been stated succinctly by Thomas Aquinas as, "a certain rectitude of mind whereby a man does what he ought to in the circumstances confronting him" (Zajda, Majhanovich, and Rust, 2006, p. 1). Social sustainability creates a sense of trust between people, allowing them to work together for a common good. Without this trust, the goal of sustainability will be impossible to reach.

Environmental sustainability

Environmental sustainability "considers the impact of business on the quality and quantity of natural resources, the environment, global warming, ecological concerns, waste management, reductions in energy and resource use, alternative energy production, and improved pollution and emissions management" (Haugh and Talwar, 2010, p. 385); this is the bottom line of sustainable development. The other two aspects of sustainable development (economic and social sustainability) ultimately depend upon the finite resources the Earth has to offer. The human population of the world is growing at a faster rate than it has ever grown before, with a predicted population of 9.22 billion people by the year 2075

(United Nations, 2004). At the current rate of population growth and consumption, the Earth simply does not possess enough resources to sustain our species (Ehrlich, 1994). Human-caused global environmental change is primarily due to the explosion in human population, in combination with our high rate of resource consumption (Vitousek, 1994). The role that humans are playing in environmental changes is a popular, yet controversial topic. However, whether these changes are the result of human activity is, at this point, becoming irrelevant. More important is the fact that humans are consuming the world's resources in a way that is not sustainable, and the environment is struggling to keep up.

Without an environment that can supply the necessary resources for human survival and prosperity, the other pillars of sustainable development are of little consequence. Given the ever-worsening state of the environment, organizations will need to understand how to teach employees the value and necessity of doing their part in reducing waste and excess consumption in order to continue a quality of life comparable to the one that most people (especially in the United States of America) are accustomed to. For this and the aforementioned reasons, the present research focuses exclusively on this environmental sustainability.

Organizational Relevance

A theme often brought up in the sustainability literature is a needed change in thinking. Organizations will have to think less in terms of 'expansion' and more in terms of growth quality, ultimately requiring a necessary reconsideration of organizational goals. *Our Common Future* (WCED, 1987) explains that sustainable development requires us to look at

the content of our growth. Organizations will have to consider whether they are growing into a more sustainable organization with efficient economic and environmental practices. Are they an organization that promotes social responsibility through their own actions? Or, is the organization merely expanding its presence in the market with little regard for how this expansion is affecting resource availability? In order to become a sustainable society, growth should be less material and energy intensive, with a focus on being equitable (WCED, 1987). Although the implementation of sustainable practices is an idea that many organizations see as a burden, these practices may ultimately benefit the organization in the form of more satisfied, productive employees. Take for example, the aerospace engineering firm, Lockheed Martin. After relocating 2,500 employees to a new green building located in Sunnyvale, California, the firm experienced a 15% decrease in employee absenteeism. The firm also reported that increases in productivity paid for the higher building costs within a year (The Economist, 2004). Further, a study conducted in Taiwan by Lee and De Young (1994) found that office-recycling programs induced feelings of intrinsic satisfaction among employees that participated in the program. Additionally, prior research has provided evidence that this intrinsic satisfaction is derived from feelings of frugality and a sense of participation (De Young, 1986).

These examples provide evidence that the human factor of implementation cannot be ignored. Organizations will need to embed these sustainable ideals into their employees by educating them on what it is, and why the organization values it. A value is a belief that may be instilled by culture, society, and personality. People tend to base their own actions in accordance with what they value (Hofstede, 1984; as cited in Pinto, Nique, et al., 2011). As

stated previously, organizations are guilty of often overlooking the necessity of behavioral changes in employees. Without a genuine value- and attitude-restructuring of the organization and employees, there will be no consistent, long-term change in behavior (Finlinson, 2008).

Regulatory focus theory may be of value if we wish to communicate this new paradigm to employees effectively. More specifically, the present study hopes to contribute to the study of environmental sustainability by examining how individual differences including optimism and hope mediate the relationship between regulatory focus and ecological behavior, such as recycling or reducing driving habits.

Regulatory Focus

Regulatory Focus theory (Higgins, 1997) is a goal approach theory, and posits that people approach their goals in different ways. Regulatory focus may result in differences in many aspects of everyday life, including important behaviors such as decision-making and performance (Gino and Margolis, 2011; Johnson and Wallace, 2011). Regulatory focus theory poses two ways of approaching our goals: a promotion focus and a prevention focus. When a goal is viewed with a promotion focus, the goal will typically be seen as a way to *achieve a positive outcome*. For example, a promotion-oriented approach to ecological behavior expression might be picking up trash off the ground as a way to make the earth more beautiful. On the other hand, when a goal is viewed with a prevention focus, it is typically viewed as a way to *avoid negative outcomes*. A prevention-oriented approach to water

conservation might induce participation in order to prevent the possibility of future water scarcity or fear of shortages.

Research has provided evidence that regulatory focus can be stable or situational; people generally have an approach they naturally gravitate towards, but situational constraints may encourage the use of one or the other (Lockwood, Jordan, & Kunda, 2002). That is, people have a generally stable promotion or prevention orientation, but either state can be induced by priming the individual to think in a more promotion- or prevention-oriented way. The current study does not attempt to induce a specific orientation; however, the results may offer valuable information about which orientation may be more effective with regards to participation in ecological behavior. If one orientation appears to be more effective, there is the possibility for organizations to harness this information in a way that will assist a transition from a culture of waste to a culture of conservation.

There has not been previous research assessing the relationship between regulatory focus and ecological behavior. However, research examining the relationship between regulatory focus and ethical behavior (Gino and Margolis, 2011) may inform the present research. This research provides evidence that a promotion-oriented individual is likely to engage in risky behaviors due to their desire to obtain a desirable outcome (e.g. “I really want this, and I’ll do whatever is necessary to get it”). On the other hand, a prevention-oriented person is less likely to engage in risky or unethical behaviors due to their desire to avoid negative outcomes (e.g. being caught). Thus, it is likely that regulatory focus may have an impact on the frequency of ecological behavior. At this point, however, it is unclear which

orientation would be more likely to participate in such behavior. This uncertainty leads to the first research question.

RQ1: How is regulatory focus orientation related to ecological behavior?

In order to explore the relationship that may exist between regulatory focus and ecological behaviors, the present study examines a number of other individual differences that may mediate the relationship between these concepts.

Optimism/Pessimism

Optimism and pessimism are two dispositional traits that all individuals possess (Orr, 2007). On a basic level, optimistic people expect good things to occur. This is an individual difference that tends to be stable over time, and reflects a person's favorable expectancies for the future (Carver, Scheier, & Segerstrom, 2010). This trait was defined based on expectancy-value theories. Expectancy theory suggests that people pursue goals based on the expectation that they possess the ability to attain those goals, and the more an individual desires to achieve a goal, the more they value it. Scheier and Carver (1985) point out that although expectancies will vary between goals, there is a more general trait-like tendency for people to have a positive or negative expectation about the probability of goal-attainment. Those with a generally positive expectation are labeled "optimistic". Alternatively, those with a generally negative expectation are labeled "pessimistic". The point is further explicated when Rand (2009) points out that those positive expectations will generally lead to a set of positive emotions, while negative expectations will generally lead to a set of negative emotions.

Having an optimistic disposition may serve a functional purpose that aids in coping and well-being during stressful situations, and may further aid the individual in persisting through challenges (Taylor and Armor, 1996). For example, Carver, Scheier, & Weintraub (1989) and Scheier, Weintraub, & Carver (1986) provide evidence that people exhibiting high levels of optimism are more likely to use problem-focused coping skills, and less likely to use avoidance and disengagement from the task (as cited in Rand, 2009). These findings have implications related to a person's likelihood of engaging in ecological behaviors. As with regulatory focus, however, it is unclear how these optimistic and pessimistic dispositions might be related to those behaviors. There are two perspectives that might describe how an optimistic individual might view ecological behavior. One perspective might consider optimism as a factor that could hinder the movement of sustainable development. For example, those with an optimistic outlook may tend to look at environmental problems, and believe that these problems will work themselves out without any need for personal intervention. The other perspective looks at optimism as something necessary for change (Orr, 2007). From this perspective, optimists are more likely to believe that their ecological behaviors will make a significant difference in the future of the environment. While the former line of reasoning would suggest that optimism would not be related to ecological behaviors, the latter perspective suggests that optimism would be associated with an increase in sustainable behaviors. These perspectives lead to the next research question:

RQ2: How is optimism related to ecological behavior?

As stated previously, a pessimistic individual is someone that, generally, expects bad things to occur (Carver, Scheier, & Segerstrom, 2010). Those that are pessimistic may use this trait as a sort of buffer against performance anxiety that is potentially debilitating (Norem and Cantor, 1986), and may further assist in the individual's management of expectations (Norem and Illingworth, 1993). As with optimism, with regard to sustainable development, this trait can be viewed in one of two ways; some may see pessimism as a hindrance to sustainable development. Pessimistic individuals may believe that the environment is beyond repair, and any ecological behavior is futile. On the other hand, pessimism could be viewed as a disposition that may be important in enacting the necessary changes. These individuals may believe that nothing will ever change unless they enact the change themselves; this view would suggest that pessimism would be associated with increases in sustainable behaviors.

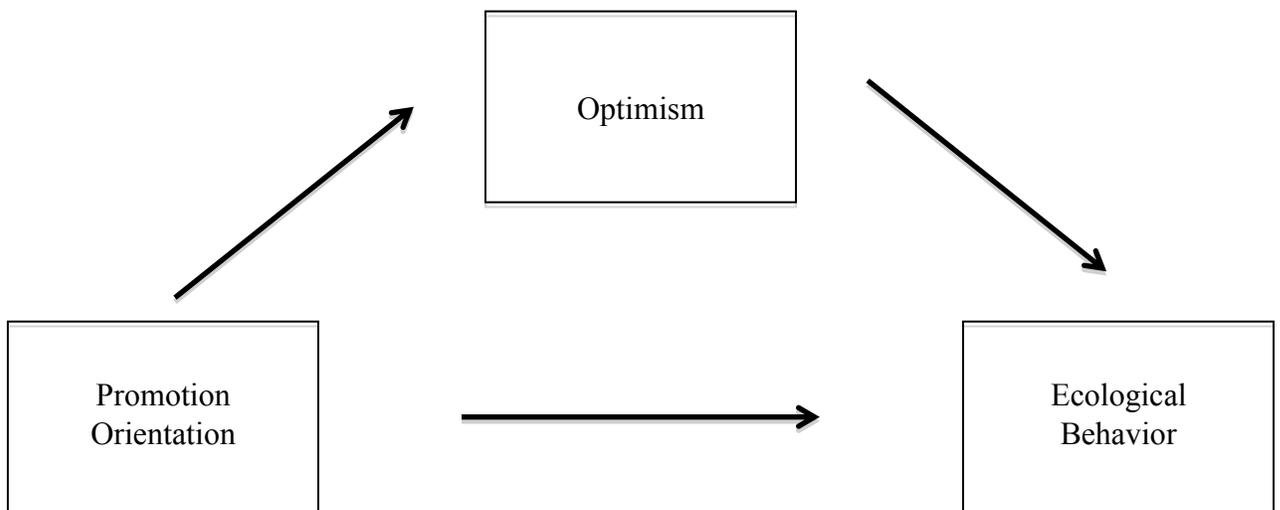
Thus, both optimistic and pessimistic people may participate in ecological behaviors based on the expectations they have about the world. When these traits are paired with regulatory focus, however, these expectations are likely to be associated with an increase in ecological behavior if there is fit between the disposition and the orientation, or result in a decrease in these behaviors if there is a discrepancy. In fact, past research has provided evidence that being dispositionally optimistic is positively correlated with being promotion-oriented (Grant and Higgins, 2003). Hazlett, Molden, & Sackett (2011) also demonstrated that promotion-oriented individuals typically preferred optimistic forecasts. Those same individuals also performed better on problem-solving tasks when they adopted an optimistic outlook. Additionally, prevention-oriented individuals typically preferred pessimistic

forecasts, and performed better on the problem-solving task when they also adopted a pessimistic outlook. Thus, the following hypotheses are proposed:

H1a: An optimistic outlook on the value of practicing ecological behaviors will partially mediate the relationship between a promotion orientation and participation in ecological behaviors (Figure 1).

H1b: A pessimistic outlook will partially mediate the relationship between a prevention orientation and participation in ecological behaviors (Figure 2).

Figure 1. Hypothesis 1a

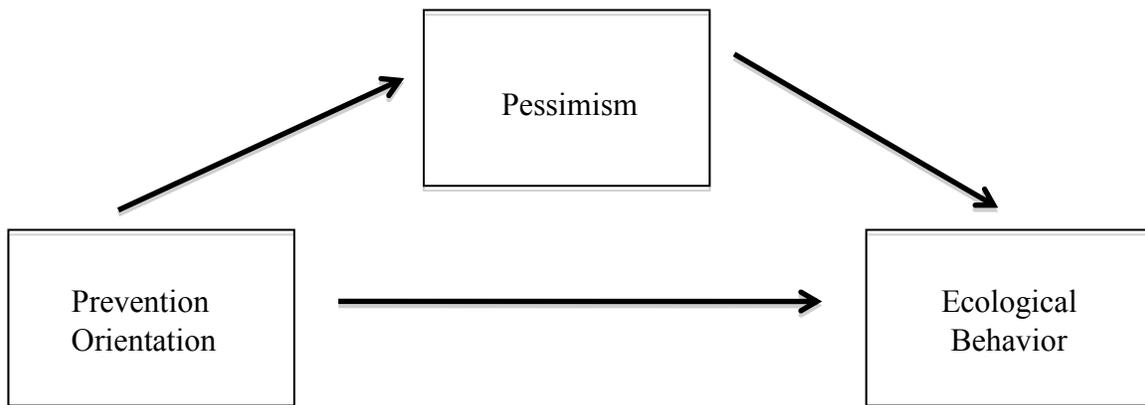


Hope

Snyder et al. (1991) states that hope is a cognitive set that is dependent upon successful agency (goal-directed determination) and a successful pathway (planning ways to meet goals). This theory is based on the assumption that human behavior is inherently goal-

directed (Rand, 2009). Indeed, we strive to accomplish goals that we have set for ourselves (Snyder, 1995), and as such, we pursue goals with the belief that we have the ability to do so (successful agency), and that we possess the means necessary to achieve that goal (successful pathway). If we do not possess both of these factors, then we are unlikely to pursue our goal.

Figure 2. Hypothesis 1b.



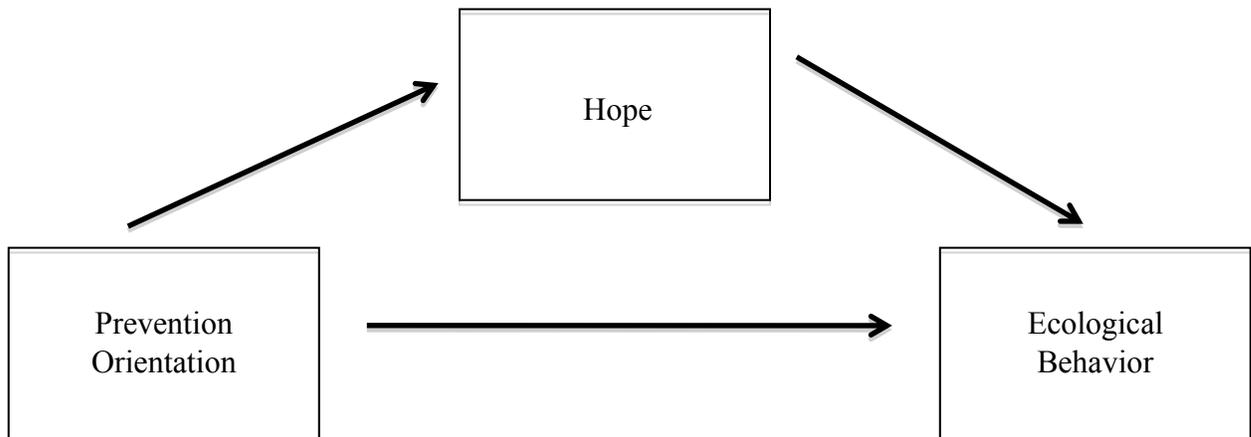
Based on this definition, hope can be viewed as something most people who consciously engage in ecological behaviors likely possess. Specifically, it is likely that individuals engaging in ecological behavior do so with the hope that their actions will benefit the environment, and in some instances, even inspire others to behave in the same way. Rand (2009) explains that a person high in hope may be better able to cope with obstacles that prevent goal-attainment, and that this perception may be beneficial because it encourages the individual to persevere even if alternate paths to goal-attainment are necessary. Thus, it is important to examine whether this evidence remains true for the relationship between hope and ecological behavior, bringing me to my third research question.

RQ3: How is hope related to ecological behavior?

Hope may also serve as an important mediator in the relationship between prevention-orientation and ecological behavior. Based on the results of their study on regulatory focus and risk-taking behaviors, Gino and Margolis (2011) concluded that a prevention-oriented individual is more likely to work to attain goals in a vigilant and goal-directed manner in an effort to avoid the negative outcomes associated with failure. In another study, Poels and Dewitte (2008) proposed the idea of prevention-hope and promotion-hope. Interestingly enough, they found that prevention-hope was more likely to result in vigilant goal-directed behavior, and that hopeful individuals approaching a goal in a prevention-oriented way are likely to “narrow their minds” (p. 1038) towards achieving that goal. This evidence leads to the following hypothesis:

H2: Hope will mediate the relationship between a prevention orientation and frequency of ecological behaviors (Figure 3).

Figure 3. Hypothesis 2.



It is important to distinguish what makes hope different from optimism. Hope is a trait that, as explained previously, depends on one's perception that they have the ability that is necessary to accomplish a goal (Snyder et al., 1991). From this, it is possible to infer that if one is given a goal in which they perceive that they have little ability or a realistic pathway by which to accomplish that goal, it is unlikely that the individual will feel hopeful about that particular goal. On the contrary, optimism is a general belief that good things will happen, regardless of personal control or pathways. An optimist may believe that good things will happen as a result of external factors such as luck or fate (Rand, 2009). If we consider this, that same person who is not hopeful about the possibility of accomplishing a goal with little perceived ability or pathway might still remain optimistic about the situation if it is in their general nature to be optimistic. Consider a study by Mageletta and Oliver (1999); these researchers found that the components that make up hope are unique entities that are separate from optimism (as well as self-efficacy). While hope and optimism may be highly related with a correlation coefficient around .50 (Snyder, et al., 1991), it is important to remember that these traits are unique, especially when considered in the context of goal-attainment.

To assess the proposed hypotheses and research questions, this study employed self-report surveys in order to assess how regulatory focus is related to participation in ecological behaviors, and how this relationship may be mediated by an optimistic or pessimistic disposition, as well as the individual's possession of hope.

Method

Participants

Participants were recruited for the present study via Sona Systems (an on-line participant pool management software system). 208 participants (50 males and 158 females) completed the study. Participants ranged in age from 18 to 49 with a mean age of 21.24 (SD=4.83). Of the 208 participants who completed the study 124 were Caucasian (59.6%), 54 were Hispanic (26%), 15 were African American (7.2%), five were Asian (2.4%), five were of mixed ethnicity (2.4%) and five did not provide a response (2.4%). Participants were granted extra credit in their undergraduate psychology courses for their participation in the study.

Measures

This study utilized a variety of self-report measures in order to assess different aspects of behavior and personality.

Demographics. This survey was administered to collect information such as gender, age, ethnicity, and level of education. The survey consisted of eight items with varying response formats (See Appendix A for a reproduction of the survey). In addition to the basic demographic questions, a brief explanation of the basic concept of sustainability was given followed by three questions written to obtain information regarding their views on sustainability issues, the views their organization has on sustainability, and how well they felt their own views of sustainability coincided with the views of their organization.

General Ecological Behavior Scale (GEB). This scale was developed by Florian Kaiser (1998) and consists of 37 items. The GEB was chosen because it was designed to, as the title implies, measure ecological behavior in a general sense, and avoids being overly specific in order to measure an individual's overarching ideals regarding ecological behavior (Kaiser, 1998). The measure consists of seven subscales that ensure generality, including: pro-social behavior (e.g. "Sometimes I give change to panhandlers"), ecological garbage removal (e.g. "I collect and recycle used newspaper"), water and power conservation (e.g. "I wait until I have a full load before doing laundry"), ecologically aware consumer behavior (e.g. "I use phosphate free laundry detergent"), garbage inhibition (e.g. "Sometimes I buy beverages in cans"), volunteering in nature protection activities (e.g. "In the past, I have pointed out to someone his or her unecological behavior", and ecological automobile use (e.g. "Usually I do not drive my automobile in the city"). Responses were recorded using a five point Likert scale, ranging from 1 (*Never*) to 5 (*Always*). Fourteen items on the scale were reverse coded, and were recoded upon data entry. Three items were excluded from the scale. Two of the items: "My automobile is ecologically sound" and "I unwrap useless packaging (i.e. nonfunctional packages) in the store" were excluded at the recommendation of Kaiser (1998) due to the lack of fit revealed with these two items. Additionally, "I would feel uncomfortable if Turks lived in the apartment next door" was also excluded from the survey because this particular question would have been of little meaning to participants in the demographic location in which the study was conducted. An internal consistency of $\alpha=.76$ was reported (Kaiser, 1998), and remained comparable in the present sample ($\alpha=.73$). See Appendix B for a reproduction of the instrument.

Regulatory Focus Scale. The Regulatory Focus Scale is an 18-item scale developed by Lockwood, Jordan, & Kunda (2002). The scale is a measure of an individual's preference towards a prevention orientation or a promotion orientation. The response format is a nine point Likert scale ranging from 1 (*not true of me at all*) to 9 (*very true of me*). The scale results in a two scale scores: one score for promotion orientation, and one score for prevention orientation. These scores are obtained by summing the promotion questions with one another, and by summing the prevention questions with one another. Both subscales have reported good internal consistency (promotion $\alpha=.81$ and prevention $\alpha=.75$; Lockwood, Jordan, & Kunda, 2002), and remained comparable for the present sample (promotion $\alpha=.84$, prevention $\alpha=.77$). The instrument is reproduced in Appendix C.

Trait Hope Scale. The Trait Hope Scale is a 12-item scale developed by Snyder et. al (1991). The scale measures the agency of hope (knowing the goal to be met) using four items. The scale also measures pathways (having a plan to meet those goals) using four items. The remaining items are distractor items used to make the intent less obvious. All questions are answered using a Likert scale ranging from 1 (*definitely false*) to 8 (*definitely true*). The total hope score is computed by adding all items (minus the filler items). The highest possible score is 32, and the lowest possible score is 8 with an average general score of 24 among college and non-college samples (Snyder, 1995). The reported internal consistency for this instrument is $\alpha=.74$ (Snyder, 1995). For the present sample, a better internal consistency of $\alpha=.84$ was demonstrated. This instrument has been reproduced in Appendix D.

Life Orientation Scale-Revised (LOT-R). This scale is a measure of optimism. The instrument was developed by Scheier, Carver, and Bridges (1994), and consists of ten items: three items are reverse coded, and four of the questions are filler items meant to disguise the intent of the scale. The response format is a five point Likert scale. Responses range from 0 (*strongly disagree*) to 4 (*strongly agree*). Reverse-scored responses were recoded upon data entry and the responses (without the filler items) are summed to provide a total optimism score (ranging from 0-24). This instrument has a reported internal consistency of $\alpha=.78$ (Scheier, Carver, and Bridges, 1994); for the present sample an internal consistency of $\alpha=.80$ was demonstrated. See Appendix E for a complete reproduction of the instrument.

Procedure

Participants were able to complete the study on-line at their convenience. Once the participant signed up in Sona Systems a link to the survey was given. An on-line data collection website (<http://www.survs.com>) was utilized for the administration of the surveys. Participants were first presented with an electronic informed consent form. Participants were informed of the general nature of the study and ensured that all responses would remain anonymous. Participants were then asked to indicate their consent to participate by typing their full name into the space provided. Once consent was obtained, participants were presented with the demographics questionnaire, followed by the GEB. The LOT-R, the Trait Hope scale, and the Regulatory Focus scale were all counterbalanced to control for order effects. Once each survey had been completed, participants were able to exit the study.

Results

Initially, a multivariate correlation matrix was calculated to assess the relationships between the variables (Table 1). The correlation matrix addressed RQ1 by providing evidence that neither dimension of regulatory focus is related to general ecological behavior (GEB), as a whole. However, a promotion orientation was significantly correlated with two subscales of general ecological behavior: the pro-social and the ecological consumerism subscales. There were no significant relationships between prevention orientation and the dependent variable; for this reason, it was excluded from all further analyses.

Therefore, there is no support for H2b. The matrix revealed that Optimism is positively related to GEB as well as two subscales: ecological garbage removal and garbage inhibition. Our final research question (RQ3) addressed the relationship between hope and GEB; the correlation matrix revealed a significant relationship between hope and GEB, as well as with the two subscales pro-social behavior and garbage inhibition. Because the GEB subscale of pro-social behavior was related to all of the predictors of interest, this subscale was examined as the dependent variable in all of the following analyses. In order to examine the hypotheses and research questions, two separate hierarchical regression analyses were conducted. Based on recommendations from Baron and Kenney (1986), the mediation hypotheses were tested by first ensuring the predictor and dependent variables in question were related (as stated above). The second step was to confirm that the proposed mediator variable was predicted by the proposed predictor variable. The third step was to confirm that the mediator variable predicted the dependent variable. Finally, the predictor variable and the mediator variable were entered into a hierarchical regression model to determine whether the model was mediated. Upon completion of these steps, if the regression results were

Table 1

Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
2	0.25**												
3	0.19**	0.01											
4	0.07	0.28**	0.22**										
5	0.03	0.36**	-0.02	0.29**									
6	0.24**	0.57**	0.02	0.21**	0.37**								
7	0.07	0.26**	-0.03	0.12	0.33**	0.32**							
8	0.43**	0.69**	0.33**	0.66**	0.59**	0.67**	0.51**						
9	0.13	0.20**	0.08	0.04	0.18*	0.05	0.03	0.17*					

10	0.20**	0.06	0.06	-0.03	0.06	-0.04	-0.04	0.05	0.53**				
11	0.09	0.16*	0.12	0.14*	0.17*	0.09	0.11	0.23**	0.30**	0.43**			
12	0.18*	0.13	0.10	0.06	0.14*	0.03	0.04	0.16*	0.29**	0.85**	0.84**		
13	0.22**	0.04	0.09	-0.15*	0.07	-0.02	-0.10	0.01	0.36**	0.47**	0.26**	0.44**	
14	0.06	-0.09	0.00	-0.13	-0.11	0.01	-0.03	-0.09	-0.42*	-0.14	-0.06	-0.12	0.20**

*Note: *p<.01 **p<.05; 1=GEB Pro-Social Behavior, 2=GEB Ecological Garbage Removal,*

3=GEB Water and Power Conservation, 4=GEB Ecological Consumerism, 5=GEB Garbage Inhibition,

6=GEB Volunteering in Nature, 7= GEB Ecological Automobile Use, 8=GEB Total Scale Score,

9=Optimism, 10=Agency Scale Score, 11=Pathway Scale Score, 12=Total Hope Scale Score,

13=Promotion Orientation, 14=Prevention Orientation

significant, a Sobel test (Preacher and Hayes, 2004) was then conducted to determine whether a significant mediation occurred. Each analysis included promotion orientation as the initial predictor variable. This variable was entered into block 1 of the analysis. The second block entered was either optimism or hope, dependent upon the research question at hand.

Optimism

This analysis employed pro-social behavior as the dependent variable. A promotion orientation was entered into Block 1 as the predictor variable. Promotion orientation and Optimism were entered into Block 2. Table 2 presents the results of this analysis. The results revealed that optimism does not mediate the relationship between a promotion orientation and pro-social behavior. Given this information, it was unnecessary to conduct a Sobel test. Figure 4 illustrates the model with the beta weights included.

Hope

Pro-social behavior was entered as the dependent variable in this analysis. Promotion Orientation was entered into block 1 as the predictor variable. Promotion Orientation and Hope were entered into Block 2. The results of this analysis are presented in Table 3. The analysis revealed that hope is not a mediator of the relationship between a promotion orientation and pro-social behavior, for this reason, it was not necessary to conduct a Sobel test. Figure 5 illustrates the model with the beta weights included.

Table 2

Promotion Orientation predicting pro-social behavior, Optimism mediating

	β	R^2	ΔR^2
Block 1		.05**	
Promotion Orientation	.22**		
Block 2		.05	.003
Promotion Orientation	.22**		
Optimism	.06		

Note: ** $p < .01$, * $p < .05$

Post Hoc Analyses

While conducting the previous analyses, an unexpected, yet interesting relationship was found. Continuing with pro-social behavior as the dependent variable it was found that when hope was entered into Block 1 as the predictor variable, and promotion orientation entered as the mediator, a significant mediational relationship emerged. Table 4 presents these findings.

A Sobel test was conducted to determine whether this mediation was significant. The result of this test revealed that promotion orientation is indeed, a significant mediator of the

relationship between hope and pro-social behavior ($z=2.19, p<.05$). This suggests that hope effects pro-social behavior vis-à-vis a promotion orientation.

Table 3

Promotion Orientation predicting pro-social behavior, Hope mediating

	β	R^2	ΔR^2
Block 1		.05**	
Promotion Orientation	.22**		
Block 2		.05	.008
Promotion Orientation	.18*		
Hope	.10		

*Note: ** $p<.01$, * $p<.05$*

Table 4

Hope predicting pro-social behavior, Promotion Orientation mediating

	β	R^2	ΔR^2
Block 1		.03**	
Hope	.18**		
Block 2		.06*	.02*
Hope	.10		
Promotion Orientation	.17*		

*Note: ** $p < .01$, * $p < .05$*

Figure 4. Model with Beta weights included

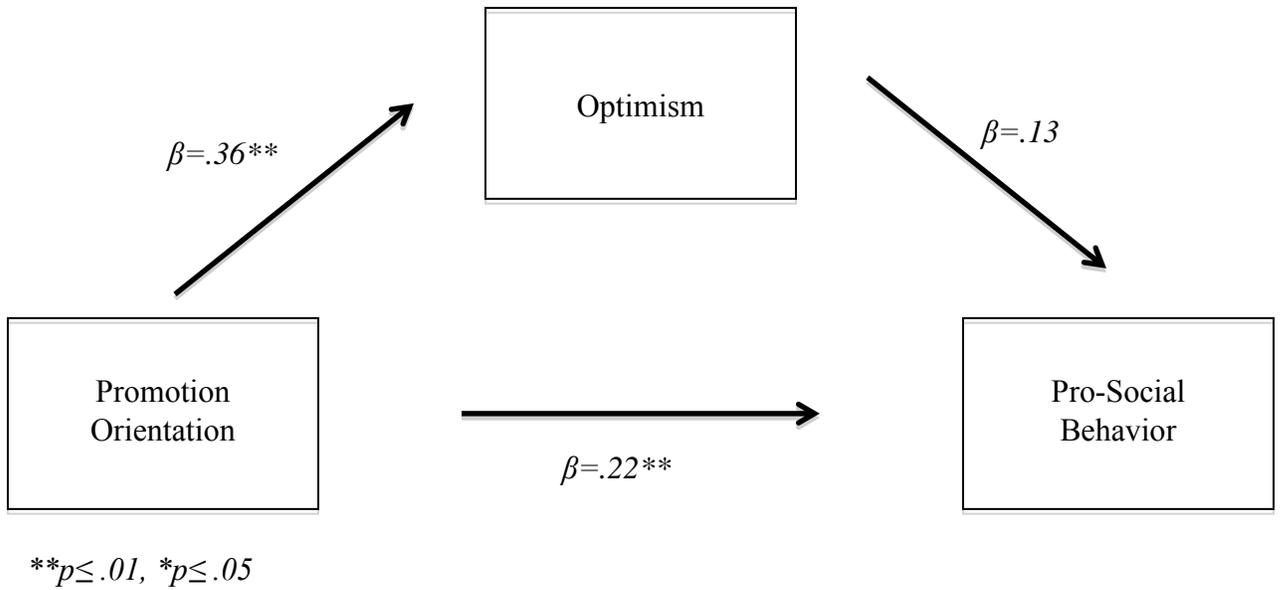


Figure 5. Model with Beta weights included

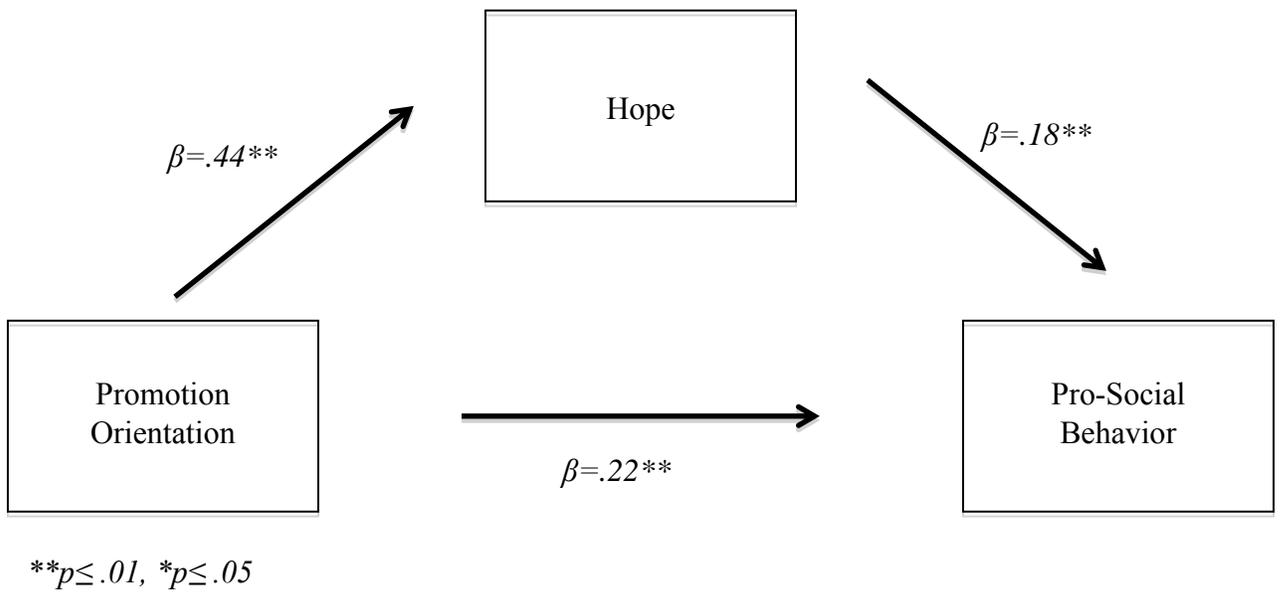
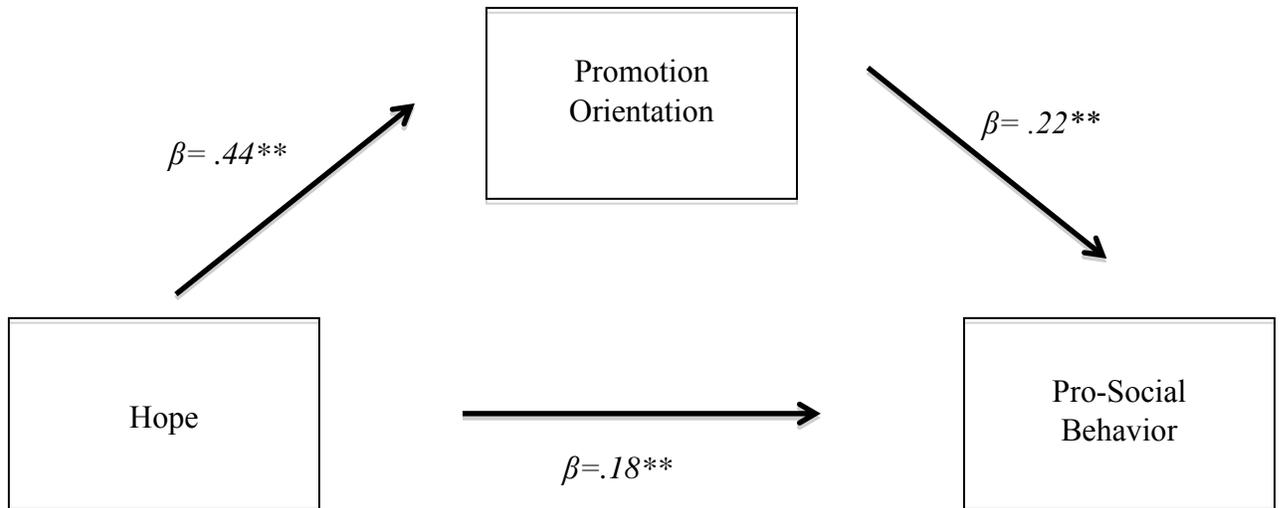


Figure 6. Model with Beta weights included



$**p \leq .01, *p \leq .05$

Discussion

The purpose of this study was to examine the relationship between ecological behaviors and regulatory focus, along with the potential role of optimism, pessimism, and hope as partial mediators of these relationships.

The results provided evidence that a promotion orientation significantly predicts participation in pro-social behavior. Recall that a promotion-oriented individual is driven by a desire to achieve positive outcomes. Brief and Motowidlo (1986) define pro-social behavior as “behavior which the actor expects will benefit the person or persons to whom it is directed.” (p. 711). Promotion-oriented individuals may engage in these pro-social behaviors to achieve positive outcomes (e.g. being perceived as a kind and friendly by

others). This finding has useful implications for the organization. Pro-social behavior has been shown to be positively related to job satisfaction (Bateman and Organ, 1983), and satisfied employees are invaluable to the organization. Furthermore, regulatory focus can be trait-like or state-like, and we now know that a promotion orientation is a predictor of pro-social behavior. With that in mind, organizations can induce a promotion orientation among employees when encouraging employees to engage in pro-social behavior. Thus, the results of this study suggest that if organizations desire to increase pro-social behaviors, by framing their interventions to induce a promotion-focus, employees might be more likely to participate in these pro-social behaviors.

The finding that a prevention orientation was unrelated to any aspect of GEB was also interesting. While there may be many reasons why these individuals do not participate in ecological behavior frequently, one possible explanation is that these individuals may also feel pessimistic about the outcome of participating in ecological behaviors. Perhaps these individuals feel that their actions will be of little consequence, and the environment will continue to degrade even if they do begin to participate. One other relevant finding related to a prevention orientation was the negative relationship found between optimism and a prevention orientation. This finding indicates that low scores on the optimism instrument (i.e., pessimism) were associated with higher prevention-orientation. This provides support for Grant and Higgins' (2003) finding that individuals prefer to experience "fit" between their regulatory foci (promotion or prevention orientation) and their general outlook (optimistic or pessimistic).

In addition to predicting pro-social behavior, promotion orientation was also found to be a significant predictor of both optimism and hope. As discussed, there have been previous studies establishing the relationship between optimism and a promotion orientation (Grant and Higgins, 2003). Individuals that are promotion-oriented tend to prefer an optimistic outlook, and will perform better on tasks when there is a fit between their focus and their outlook (e.g. promotion-oriented and optimistic). Given the strong correlation between hope and optimism (Snyder, et al., 1991), one might infer that this also may be true for regulatory focus and hope. This is supported by Poels and Dewitte's (2008) proposal of the existence of two types of hope that differ in their utility: promotion-hope and prevention-hope. An individual high in promotion-hope hopes to attain something positive, whereas an individual high in prevention-hope hopes to avoid something negative. With this in mind, it may also be possible that people prefer fit between their focus (promotion or prevention) and hope (promotion or prevention). When attempting to motivate employees, management should keep in mind that the employee will perform best if their focus (promotion or prevention) matches their outlook (optimistic or pessimistic). For the promotion-oriented individuals, it is best to present information and goals in an optimistic light, and for the prevention-oriented individuals it may be most effective to present information in a way that expresses the negative consequences that may result if they do not participate in a particular behavior.

The study also found optimism to be significantly related to GEB (Table 1). Recall that there are two possible perspectives one might take when hypothesizing about how an optimist might choose to behave in regards to ecological behavior. The first perspective may view optimism as an outlook that might hinder someone's likelihood of participating because

they may feel that environmental degradation is something that will work itself out without any personal intervention. The second proposes that optimistic individuals are more likely to participate because they feel that their own contribution is meaningful and important for the future of the environment. The results of the present study provide evidence that optimism is positively related to GEB; thus the second perspective is more likely, which proposes that optimism may be a prerequisite to change (Orr, 2007). Given the correlational nature of the present study, however, we cannot conclude that being optimistic will *cause* someone to participate in ecological behavior, but we can conclude that optimistic people are more likely to participate. This is important for organizations to note. This study asserts that it may be difficult for organizations to fully embed sustainable practices into their organization if employees do not feel optimistic about doing so. Therefore, interventions designed to increase ecological behaviors should emphasize reasons that employees should be optimistic about the proposed changes.

Hope was also found to be significantly related to GEB. Interestingly, it was found that the agency component of hope was unrelated to general ecological behavior, but that the pathway component and the overall hope score are both positively related to general ecological behavior (Table 1). This finding suggests that the goal-directed determination (agency) is less important than our belief that we have the means (pathway) to effectively participate in ecological behaviors. Again, however, we cannot conclude that pathway effectively *causes* participation in ecological behavior, only that those who participate in ecological behaviors tend to also believe that they have the means to successfully do so. Organizations can keep this in mind when engaging in goal-setting exercises with employees.

If the organization expects the employee to be motivated, management should ensure that the employee has sufficient tools to be successful in completing the goals set for them.

Perhaps one of the most interesting results found in the study was one that failed to align with the initial hypotheses. A significant mediational model was found when hope was tested as the predictor variable, a promotion orientation as the mediator, and pro-social behavior as the dependent variable. Thus, it may be more likely that the relationship between hope and pro-social behavior is actually mediated by a promotion-focus, rather than the originally proposed relationships. Indeed, it may be that hope leads to a promotion-focus, which then leads to pro-social behavior. Thus, if hope is the first “step” in this process, organizations may want to focus on presenting information regarding the implementation of new sustainability initiatives in a way that will make employees feel hopeful about the proposed changes (e.g. by showing they have their actions will make a difference, and explaining how they can effectively participate). Specifically, when encouraging employees to participate in pro-social behavior, this result suggests that the best approach would be to emphasize the benefits of doing so, to invoke feelings of hope (e.g. being thought of as friendly, becoming friends with colleagues, being viewed as a team-player, etc.), and making sure the employee knows how to engage in such behaviors (e.g. holding the elevator door for a colleague, engaging in friendly conversation with a new employee, cheering up a worried colleague), which will lead to a state of promotion-oriented focus, resulting in a greater likelihood that said employees will participate in pro-social behaviors. However, this finding should be interpreted with caution as the analysis was conducted post-hoc, and should be studied further to confirm its validity.

Limitations and Future Directions

A few important limitations of the study need to be addressed. First, participants in this study consisted solely of undergraduate students. As the goal of the study was to shed light on these relationships to inform organizations, the results of the study might not generalize well to the general population of employees who are not concurrently in college. It would have been interesting to see if a sample of older adult employees would have produced different results than a sample of undergraduate students. Given that college students also tend to be younger than the average employee, it would also be interesting to see if these relationships remained the same among older individuals.

Along the same lines, the gender ratio of the study must also be addressed. Females outnumbered males three to one in this study. Interestingly, we also found gender to be positively related to both dimensions of regulatory focus. Specifically, women were more likely to score high on both dimensions than men (i.e., men were more likely to score in the middle of the spectrum of promotion- or prevention-orientation). While one study found evidence that females tend to score higher in promotion focus (Winterheld and Simpson, 2011) it is difficult to say with confidence that the relationship found in this study has any meaningful contribution to make, given the skewed gender ratio. Additionally, while we see this trend changing, males still vastly outnumber women in top organizational positions (Peterson and Philpot, 2007; Helfat, Harris, & Wolfson, 2006). The generalizability of the overall findings may be further compromised given that this study is on the opposite end of the spectrum in terms of gender underrepresentation. A future study might wish to examine

the validity of the relationship found between gender and regulatory focus with a more representative sample, and may further wish to examine how gender effects the relationship between regulatory focus and pro-social behavior as well as other general ecological behaviors.

It is also important to acknowledge the finding that promotion orientation mediates the relationship between hope and pro-social behavior, rather than the originally proposed relationships. This finding was discovered post-hoc, and as mentioned, any interpretation of this finding should be made with caution. A future study might re-examine this finding a priori so that implications of this finding might be made with greater certainty.

A future direction that may be of interest would be to consider the other pillars of sustainability discussed. This study chose to focus exclusively on ecological behavior as a starting point. Given that ecological behavior is the bottom line of sustainability, and the limited amount of research linking the two fields, this seemed like a logical starting point. However, this is not meant to imply that the other aspects of sustainability are unimportant topics to research in the field of I/O psychology. While there is considerable evidence that promotion-oriented individuals are more likely to take risks in order to accomplish a task (Gino and Margolis, 2011), it may be interesting to study this in the context of economic sustainability. Specifically, the study might consider the differences between promotion- and prevention-oriented executives who make decisions about when and how to use the organization's financial resources. The results of such a study might provide information about which foci is likely to result in an organizational economy that is sustainable. On

another note, understanding the traits and characteristics of individuals who feel that they ought to be socially responsible is important in advancing the goals of sustainability, and is important to the success of organizations (e.g. in avoiding theft, reporting of unethical behaviors, etc.). It would be interesting to see what (if any) link exists between predictors of pro-social behavior and social responsibility.

Finally, future research should be conducted to determine the sequence of the relationships of the variables examined in this study. The finding that promotion-orientation partially mediates the relationship between hope and pro-social behavior (rather than hope mediating the relationship between promotion-orientation and pro-social behavior) was somewhat surprising. This finding should be replicated in a future study specifically designed to test that relationship. It is important to clearly understand which variable is the predictor variable and which is the mediator so that organizations can better understand how to effectively communicate the importance of following through with new sustainable practices. If a promotion orientation is the predictor, organizations can focus on framing their information in a way that promotes the positive outcomes that can result in participating. On the other hand, if hope is the predictor, organizations should focus on effectively communicating the impact such behaviors will have as well as demonstrating different ways that employees can participate in order to induce successful feelings of the pathway dimension of hope.

Taken together, the results of this study suggest that when encouraging employees to participate in pro-social behavior, the best approach would be to emphasize the benefits of

doing so (e.g. being thought of as friendly, becoming friends with colleagues, being viewed as a team-player, etc.), and making sure the employee knows how to engage in such behaviors (e.g. holding the elevator door for a colleague, engaging in friendly conversation with a new employee, cheering up a worried colleague). Although the findings of this study were somewhat unexpected, and the originally proposed hypotheses were not supported, an overarching goal of this study was to find relevant ways in which I/O psychologists can contribute meaningfully to the organizational implementation of sustainable practices, and that goal was accomplished. We are approaching an era that will require organizations and individuals to be more conscientious of the choices they make, and how these choices will affect the environment and those around them. In order for organizations to align with the WCED's (1987) mission to create a society that will "meet the needs of the present without compromising the ability of future generations to meet their own needs" (p. 8) they will first have to understand how to communicate the importance of doing so with their own employees, and it is my hope that this and future related research can assist them in doing so.

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APPENDIX A

Demographics

1. Type in a code name (e.g. “Zeus”, “little dog”, etc.)
2. Your gender is:
3. Your age is:
4. What is your ethnicity?
5. Please indicate your level of education.

Sustainability is acting in such a way that we are able to meet the needs of the present without compromising the ability of future generations to meet their own needs. There are three main components of sustainability: economic sustainability, social sustainability, and environmental sustainability.

6. To what extent do you personally value sustainability?*
7. To what extent do you believe your organization values sustainability?*
8. To what extent do you believe your environmental sustainability values are consistent with those held by your organization?*

*These items included the following response choices: Not at all, Small extent, Moderate extent, High extent, Very high extent, Not sure

APPENDIX B

General Ecological Behavior Scale

Please indicate the frequency with which you participate in the following behaviors:

Response Choices: Never, Almost Never, Sometimes, Almost Always, Always

1. Sometimes I give change to panhandlers.
2. From time to time I contribute money to charity.
3. If an elderly or disabled person enters a crowded bus or subway, I offer him/her my seat.
4. If I were an employer I would consider hiring a person previously convicted of a crime.
5. In fast food restaurants, I usually leave the tray on the table.*
6. If a friend or relative had to stay in a hospital for a week or two for minor surgery (e.g. appendix removal, broken leg), I would visit him/her.
7. Sometimes I ride public transportation without paying a fare.*
8. I put dead batteries in the garbage.*
9. After meals, I dispose of leftovers in the toilet.*
10. I bring unused medicine back to the pharmacy.
11. I collect and recycle used paper.
12. I bring empty bottles to a recycling bin.

13. I prefer to shower rather than to take a bath.
14. In the winter, I keep the heat on so that I do not have to wear a sweater.*
15. I wait until I have a full load before doing laundry.
16. In the winter, I leave the windows open for long periods of time to let in fresh air.*
17. I wash dirty clothes without prewashing.
18. I use fabric softener with my laundry.*
19. I use an oven-cleaning spray to clean my oven.*
20. If there are insects in my home I kill them with a chemical insecticide.*
21. I use a chemical air freshener in my bathroom.*
22. I use chemical toilet cleaners.*
23. I use a cleaner made especially for bathrooms rather than an all-purpose cleaner.*
24. I use phosphate-free laundry detergent.
25. Sometimes I buy beverages in cans. *
26. In supermarkets, I usually buy fruits and vegetables from the open bins.
27. If I am offered a plastic bag in the store I will always take it.*
28. For shopping, I prefer paper bags to plastic ones.
29. I usually buy milk in returnable bottles.
30. I often talk with friends about problems related to the environment.
31. I am a member of an environmental organization.
32. In the past, I have pointed out to someone his/her unecological behavior.
33. I contribute financially to environmental organizations.
34. I do not know whether I used leaded gas in my automobile.*

35. Usually, I do not drive my automobile in the city.

36. I usually drive on freeways at speeds under 62.5 mph

37. When possible in nearby areas (e.g. less than 18 miles), I use public transportation or
ride a bike.

*These items were reverse scored before analyses.

APPENDIX C

Regulatory Focus Scale

Below there are statements that may or may not describe you. Answer the items honestly, not as you might wish you were, but as you are.

Please read each statement carefully, and then choose the appropriate response from those provided.

Response choices: Not at all true of me, Mostly untrue of me, Sometimes untrue of me, Slightly untrue of me, Neither true or untrue of me, Slightly true of me, Sometimes true of me, Mostly true of me, Entirely true of me

1. In general, I am focused on preventing negative events in my life.
2. I am anxious that I will fall short of my responsibilities and obligations.
3. I frequently imagine how I will achieve my hopes and aspirations.
4. I often think about the person I am afraid I might become in the future.
5. I often think about the person I would ideally like to be in the future.
6. I typically focus on the success I hope to achieve in the future.
7. I often worry that I will fail to accomplish my work-related goals.

8. I often think about how I will achieve work-related success.
9. I often imagine myself experiencing bad things that I fear might happen to me.
10. I am more oriented toward preventing losses than I am toward achieving gains.
11. My major goal right now is to achieve my work-related ambitions.
12. My major goal right now is to avoid becoming a failure at work.
13. I see myself as someone who is primarily striving to reach my "ideal self" — to fulfill my hopes, wishes, and aspirations.
14. I see myself as someone who is primarily striving to become the self I "ought" to be — to fulfill my duties, responsibilities, and obligations.
15. In general, I am focused on achieving positive outcomes in my life.
16. I often imagine myself experiencing good things that I hope will happen to me.
17. Overall, I am more oriented toward achieving success than preventing failure.

APPENDIX D

The Trait Hope Scale

Read each item carefully.

Please indicate the extent to which each item describes you.

Response choices: Definitely False, Mostly False, Somewhat False, Slightly False, Slightly

True, Somewhat True, Mostly True, Definitely True

1. I can think of many ways to get out of a jam.
2. I energetically pursue my goals.
3. I feel tired most of the time. (Filler item)
4. There are lots of ways around any problem.
5. I am easily downed in an argument. (Filler item)
6. I can think of many ways to get the things in life that are important to me.
7. I worry about my health. (Filler item)
8. Even when others get discouraged, I know I can find a way to solve the problem.
9. My past experiences have prepared me well for my future.
10. I've been pretty successful in life.
11. I usually find myself worrying about something. (Filler item)
12. I meet the goals that I set for myself.

APPENDIX E

The Life Orientation Test-Revised

Response choices: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

1. In uncertain times, I usually expect the best.
2. It's easy for me to relax. (Filler item)
3. If something can go wrong for me, it will. *
4. I'm always optimistic about my future.
5. I enjoy my friends a lot. (Filler item)
6. It's important for me to keep busy. (Filler item)
7. I hardly ever expect things to go my way. *
8. I don't get upset too easily. (Filler item)
9. I rarely count on good things happening to me. *
10. Overall, I expect more good things to happen to me than bad.

* These items were reverse scored before analysis.